

NUTRITION FOR HEALTH PROMOTION IN NURSING EDUCATION:
KNOWLEDGE, ATTITUDES, BELIEFS, AND INSTRUCTIONAL PRACTICES OF
NURSING FACULTY

by

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ABSTRACT

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Background

Nutrition's role in health is undisputed, yet nursing education programs do not consistently integrate essential nutrition content into curricula. Nurses are well-positioned throughout the healthcare system to provide health-promoting nutritional guidance but must have the requisite knowledge to do so.

Purpose

The purpose of this study was to describe the knowledge, attitudes, beliefs, and instructional practices of nursing faculty regarding teaching nutrition for health promotion.

Methods

The theory of planned behavior with Wilkins' KABP model was employed as the theoretical framework for the descriptive study. A pre-study validity evaluation of the attitude and belief measures for sufficiency, relevance, clarity, and coherence was completed by a group of experts. Data were collected via a nationwide survey of full-time faculty members ($n = 266$) teaching in prelicensure baccalaureate nursing programs. The

instrument comprised five sections measuring knowledge (General Nutrition Knowledge Questionnaire-Revised), attitudes, beliefs, instructional practices, and demographics.

Results

The scores on the knowledge measure ranged from 59% to 95% ($M = 80\%$, $SD = 6.6$, 95% CI (69.77 [79.2%], 71.37[81.1%])). Attitude scores ranged from -7 to 20, with the average being 13.1 ($SD = 5.10$, 95% CI [12.47, 13.70]), and 80% of respondents' attitude scores fell in the top quarter (> 11). Belief scores ranged from -11 to 20, with the average being 7.08 ($SD = 5.93$, 95% CI [6.36, 7.79]). Only 154 (57.9%) of respondents have had previous experience teaching nutrition for health promotion.

Conclusion

The findings highlight the importance of continuing education and resources for nursing faculty members in promoting the inclusion of nutrition for health promotion in prelicensure nursing education. Academic nursing must work to ensure that nursing program graduates are well-equipped with the required competencies to deliver health-promoting nutritional guidance and impact the growing chronic disease burden caused by poor diet.

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LIST OF TERMS

Nursing faculty:	Licensed, professional nurses who teach in a prelicensure baccalaureate nursing program, generally with advanced degrees in Nursing; Related term: Nurse educator
Baccalaureate nursing program:	An undergraduate, pre-licensure educational program offered at a university that prepares students for a career as a professional nurse; graduates earn a bachelor of science in nursing degree
Nutrition for health promotion:	A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease. Also, avoiding foods or food-like substances that are known to contribute to poor health (Chakrabarty & Chakrabarty, 2019; Dernini & Berry, 2016; ODPHP, 2020; Romagnolo & Selmin, 2016; United States Department of Agriculture, 2020).
Health promotion:	The process of enabling people to increase control over and improve their health (World Health Organization, 2022)
Wellness:	A state of being characterized by physical health and emotional stability (American Association of Colleges of Nursing, 2021)
Health:	A subjective state of physical, mental, and social well-being; not merely the absence of disease. (American Nurses Association, 2021; World Health Organization, 2023)

CHAPTER ONE

INTRODUCTION

Health promotion is a primary responsibility of the professional nurse, and nutrition is critical for promoting health and wellness; therefore, prelicensure baccalaureate nursing education programs should emphasize nutrition for health promotion in their curricula. The content and skills necessary to provide health-promoting nutritional guidance should be consistently and systematically integrated into prelicensure nursing education programs. In its definition of nursing, the American Nurses Association (ANA) notes that nursing... "focuses on the protection, promotion, and optimization of health and human functioning" and the "prevention of illness" (2021, p. 1). Further, the ANA names *health promotion* as a required competency for registered nurses and states that nurses should intervene to "teach and promote health and wellness" (2021, p. 1). Health promotion is a broad concept, spanning from social and environmental-level activities to interventions that target individual behaviors and choices (ANA, 2021; World Health Organization [WHO], 2022). Nutrition and diet are included in the latter and are integral factors in the promotion of health (Office of Disease Prevention and Health Promotion [ODPHP], 2020). As such, the prelicensure educational programs that prepare nurses should facilitate the development of competencies needed to provide health-promoting nutritional guidance.

Experts have expressed concerns about the adequacy of nutrition for health promotion in prelicensure nursing education, but there is an absence of empirical evidence to support or refute that claim (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Kris-Etherton et al., 2014; Sacks, 2017). Since nursing faculty are responsible for

developing and delivering the curriculum in prelicensure nursing programs (Accreditation Commission for Education in Nursing [ACEN], 2017; Commission on Collegiate Nursing Education [CCNE], 2024), they determine whether or not nutrition for health promotion content is incorporated into the curriculum and the methods for teaching it. The purpose of this study was to describe the content knowledge, attitudes, beliefs, and instructional practices of nursing faculty employed in prelicensure baccalaureate nursing programs regarding teaching nutrition for health promotion. Chapter One will introduce the study by discussing the background, the research problem and aims, and the study's significance.

Background

There is a growing need for nursing faculty to teach their students about nutrition for health promotion. Diet-related chronic health problems are increasing in prevalence and contribute significantly to morbidity and mortality, as well as to decreased quality of life (Centers for Disease Control [CDC], 2021; CDC, 2020; Lane et al., 2022; U.S. Department of Agriculture [USDA], 2020; World Health Organization [WHO], 2024). The U.S. Office of Disease Prevention and Health Promotion (ODPHP) (2020), in *Healthy People 2030*, recognized the critical interplay between nutrition and health by naming *Improving health by promoting healthy eating and making nutritious foods available* as one of the overarching goals of the decade. Furthermore, the *consumption of calories from added sugars in persons over two years* has been designated a leading health indicator (LHI) by the ODPHP (2020), a move that advances the concept of diet quality to utmost importance. The provision of nutritional guidance for health promotion

is an effective and low-cost intervention (Azami et al., 2018; Carrington & Zimmet, 2017; Coppel et al., 2017; Diabetes Prevention Program (DPP) Research Group, 2015; Estruch et al., 2013; Salas-Salvado et al., 2019) that aligns with the evolving priorities of the U.S. government to improve the nutritional health of its citizens (ODPHP, 2020). Nurses are well-positioned throughout the healthcare system to provide this guidance, but only if they are prepared to do so in their prelicensure education (American Association of Colleges of Nursing [AACN], 2019; ANA, 2021; Kris-Etherton et al., 2014; DiMaria-Ghalili et al., 2014).

The curriculum in prelicensure nursing education programs has traditionally emphasized the care of the sick over preventative care and wellness (AACN, 2019; AACN, 2021). However, changes in nursing education are underway that will require nursing faculty to focus more on preventative healthcare interventions. According to the AACN's (2019) *Vision of Academic Nursing*, traditional nursing educational models and priorities must change to prepare the future nursing workforce to address emerging health outcome concerns. Experts contend that academic nursing can play an essential role in transforming the healthcare system from acute-care-focused into one that also emphasizes disease prevention and health promotion (AACN, 2019; AACN, 2021; Vesley, 2014).

To meet the imperative for transformation in nursing education, in its latest iteration of *The Essentials: Core Competencies for Professional Nursing Education*, the AACN (2021) addresses changing healthcare priorities by naming *Wellness and Disease Prevention* one of its overarching *Four Spheres of Care*. In doing so, they have placed nursing care that promotes health and wellness on equal footing with nursing care of the

acutely and chronically ill. Given the historical emphasis in the curriculum on caring for those who are already ill (AACN, 2019), prelicensure baccalaureate nursing programs will be challenged to determine if faculty are equipped to develop, in their graduates, competencies related to preventative care (AACN, 2021). The provision of health-promoting nutritional guidance is one such competency.

Health-promoting nutritional guidance effectively improves health by reducing the incidence and severity of chronic health problems (Azami et al., 2018; Carrington & Zimmet, 2017; Coppel et al., 2017; Diabetes Prevention Program (DPP) Research Group, 2015; Estruch et al., 2013; Salas-Salvado et al., 2019). Nurses are the largest group of healthcare professionals in the United States and work in the full spectrum of healthcare settings where innumerable opportunities for providing health-promoting nutritional guidance exist (AACN, 2019; U.S. Department of Labor, 2018). Nurse employment and healthcare delivery are shifting to primary care and community-based settings, which are more amenable to interventions that promote health and disease prevention than acute care (hospital) settings (AACN, 2019; Vesley, 2014). The foundation of knowledge and attitudes established in initial professional education significantly influences professional practice (Barr & le May, 2012; Garret, 2012). It is unknown, however, to what extent nursing faculty are incorporating nutrition for health promotion into nursing curricula.

Nutrition in Nursing Education: Current Instructional Practices

The structure and content of nutrition education in prelicensure nursing programs are variable, and there are no standardized competencies or curricula to guide programs

or faculty (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Kris-Etherton et al., 2014). In the United States, the published test blueprint for the National Council Licensure Examination for Registered Nurses (NCLEX-RN) provides some guidance for curriculum development since nutrition is tested on the exam; however, the NCLEX test blueprint does not explicitly describe nutrition for health promotion as a distinct content area (National Council of State Boards of Nursing [NCSBN], 2022). Current research describing nutrition content in U.S. prelicensure nursing curricula reveals that nutrition content most commonly included is related to the nutritional needs of acutely ill (hospitalized) patients, namely, enteral nutrition (97.7%), parenteral nutrition (97.6%) and assessment for risk of malnutrition (95%) (Chao et al., 2020). *Nutrition counseling* was included in approximately 68% of programs, but the nature of the counseling (i.e., health promotion vs. other) was not described (Chao et al., 2020). Research is needed to understand better if content related to nutrition for health promotion is taught in prelicensure nursing programs.

Nursing faculty deliver nutrition content through dedicated nutrition courses, incorporating it throughout the curriculum, or a combination of both approaches, but it is not known if any of these models results in better outcomes than another (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Sodjinou et al., 2014; Stotts et al., 1987). Sodjinou et al. (2014) found that most dedicated nutrition courses were taught early in the course of study (first year); thereby, nutrition content emphasized in the dedicated course was most commonly basic nutrition science, taught in a purely didactic (lecture) format. These researchers and other experts have recommended that nursing students have opportunities

throughout their preparatory education to apply what they are learning about nutrition in the classroom via clinical and simulation experiences (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Sodjinou et al., 2014), but it is not known if or to what extent this is being done.

Academic nursing can assist in meeting the emerging demand to equip nurses with the knowledge and skills necessary to promote wellness and improve diet-related health outcomes (AACN, 2019; Vesley, 2014). Nursing faculty in prelicensure baccalaureate nursing programs are responsible for developing and delivering the curriculum of their respective programs (ACEN, 2017; CCNE, 2024), but it is not known if nursing faculty have the knowledge, attitudes, or beliefs that are amenable to teaching nutrition for health promotion. No research described nursing faculty members' knowledge, attitudes, and beliefs regarding nutrition or teaching about nutrition. However, since nursing faculty are licensed nurses (ACEN, 2017; CCNE, 2024), findings in the research that describe nurses' knowledge, attitudes, and beliefs regarding nutrition and nutrition for health promotion will be assumed to also apply to nursing faculty. The research on nurses' knowledge, attitudes, and beliefs regarding nutrition informed the research questions and the study design.

Nutrition Knowledge of Nursing Faculty

Nursing faculty members are primarily responsible for teaching nutrition content, though they may not have the requisite knowledge to do so (Chao et al., 2020; Di-Maria Ghalili et al., 2014; Kris-Etherton et al., 2014; Sodjinou et al., 2014). Though no studies were found that measured the nutrition knowledge of nursing faculty, empirical studies

that measured nurses' actual nutrition knowledge, though variable in measures and nutrition domains studied, reveal varying degrees of nutrition knowledge deficits (Al-Shwaiyat et al., 2013; Bauer et al., 2015; Boaz et al., 2013; Crogan et al., 2001; Endevelt et al., 2009; Hakonsen et al., 2018; Ilmonen et al., 2012; Kim & Choue, 2009; Lindseth, 1990; Lindseth, 1994; Lyu et al., 2021; Naser et al., 2021; Patil & Balai, 2021; Stanek et al., 1991). In studies that measured knowledge of content explicitly related to nutrition for health promotion, researchers concluded that nurses probably do not have the requisite knowledge to provide health-promoting nutritional guidance effectively (Al-Shwaiyat et al., 2013; Kable et al., 2015; Lindseth, 1990; Naser et al., 2021). Furthermore, current information about nurses' nutrition knowledge in the U.S. population is lacking in that all studies conducted in the United States are outdated (Crogan et al., 2001; Lindseth, 1990; Lindseth, 1994; Stanek et al., 1991).

Nursing faculty members in an exploratory study examining their perceptions of nutrition instruction in baccalaureate nursing education indicated that *faculty training in nutrition* was the most important resource needed to improve nutrition education and named *insufficient numbers of qualified faculty* as a significant barrier (Chao et al., 2020). Similarly, Sodjinou et al. (2014) noted a *lack of dedicated teaching staff with expertise in nutrition* as a barrier to the effective provision of nutrition education for nursing students. These nursing faculty perceptions, coupled with nurses' nutrition knowledge deficits reported in previous studies, substantiate the concern that nursing faculty nutrition knowledge may not be adequate to teach nutrition for health promotion.

Nurses' Attitudes and Beliefs Regarding Nutrition

Faculty knowledge about nutrition for health promotion is a prerequisite for teaching nutrition for health promotion. Still, faculty knowledge alone may not be enough to ensure the adequacy of teaching nutrition for health promotion. Attitudes and beliefs about curricular content and instructional methods are known to impact an educator's instructional practices (Ernest, 1989; Wilkins, 2008). Ernest (1989) and Wilkins (2008) described the interrelationships among educators' knowledge, attitudes, and beliefs, as well as the collective impact of these variables on an educator's likelihood of adopting curricular change and innovative teaching strategies. An educator's attitudes and beliefs are separate characteristics that impact each other and are both impacted by content knowledge (Wilkins, 2008). Studies corroborate Wilkins's (2008) findings about the influencing power of attitudes and beliefs on instructional practices (Akhter et al., 2021; LePage et al., 2015; Raker, 2022). As such, it is essential to understand faculty members' attitudes and beliefs, in addition to content knowledge, to better understand how to improve nutrition education in prelicensure nursing programs.

Attitudes

Nursing faculty attitudes about subject matter do impact instructional practices, as noted in studies concerning 1) high-fidelity simulation (Akhter et al., 2021), 2) teaching smoking cessation to nursing students (LePage et al., 2015), and 3) incorporation of human trafficking into nursing curriculum (Raker, 2022). Studies about nursing faculty attitudes regarding teaching nutrition for health promotion were not found; however,

studies examining nurses' attitudes about providing nutrition-related nursing care were found, and themes emerged that are relevant to this study.

Several studies revealed that though nurses have positive attitudes regarding the importance of nutrition-related care on health, negative attitudes about the nurses' responsibility to provide nutrition-related nursing care were common (Boaz et al., 2013; Kable et al., 2015; Lyu et al., 2021; Naser et al., 2021). Negative attitudes are a concern because nursing faculty with negative attitudes about the nurse's role in providing health-promoting nutritional guidance may not intend to teach students the content and counseling skills needed to provide it. Chao et al. (2020) found that only 35% of nursing faculty agreed that their students were adequately prepared to counsel patients about their diet. However, despite this low percentage, nearly 60% of the faculty agreed that nutrition instruction was sufficient (Chao et al., 2020), suggesting that some faculty may not believe that dietary counseling is a priority for nursing education. Still, additional research is needed to explore this question.

Beliefs

In addition to content knowledge and attitudes, faculty beliefs about teaching subject matter also influence instructional practices (Ajzen, 1991; Ajzen, 2002; LePage et al., 2015; Wilkins, 2008). Wilkins (2008) described and tested a predictive model of math teachers' instructional practices that named *beliefs* as the most predictive variable due to its mediating effect on content knowledge and attitudes. No research was found that describes nursing faculty beliefs regarding teaching nutrition for health promotion; however, there is evidence that suggests that, in general, nurses believe that they lack the

knowledge, skills, and confidence to provide nutrition-related nursing care (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Naser et al., 2021). Additionally, faculty in Chao et al.'s (2020) study believed that insufficient time in the curriculum, higher priority content items, and insufficient numbers of qualified faculty were barriers to providing nutrition education in the nursing curriculum. This study is the first known to describe nursing faculty members' attitudes and beliefs regarding nutrition for health promotion.

Research Problem

Graduates of prelicensure baccalaureate nursing programs will increasingly be called upon to address clients' diet-related health promotion needs (AACN, 2019; AACN, 2021). Nursing faculty will need to include nutrition for health promotion in prelicensure nursing programs if evolving curricular priorities are to be met (AACN, 2019; AACN, 2021). It was not known if nursing faculty are currently incorporating nutrition for health promotion into curricula. Furthermore, though previous studies provide some insight into the knowledge, attitudes, and beliefs of nurses regarding nutrition generally, no prior research was found that assessed whether nursing faculty have the knowledge, attitudes, and beliefs necessary to facilitate curricular integration of nutrition for health promotion. This knowledge gap is a problem for prelicensure baccalaureate nursing programs, which must ensure that nursing faculty are well-prepared and experienced in the content areas in which they teach (ACEN, 2017; CCNE, 2024) and that the nursing workforce is prepared to promote wellness and disease prevention in its responsibility to optimize health (AACN, 2021; ANA, 2021). This study described nursing faculty attributes (knowledge,

attitudes, beliefs) that affect the intent to teach nutrition for health promotion and ensure its systematic integration into curricula. Additionally, this study described current instructional practices and the extent to which nutrition for health promotion is being taught. This knowledge will assist nursing faculty in undergraduate nursing programs to determine if changes in curriculum, instructional practices, and nursing faculty development are needed.

Research Aim

The primary aim of this study was to describe prelicensure baccalaureate nursing faculty members' content knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. A secondary aim was to determine if relationships exist among the research variables. The following research questions were answered:

1. What is the prelicensure baccalaureate nursing faculty members' level of content knowledge regarding nutrition for health promotion?
2. What are the prelicensure baccalaureate nursing faculty members' attitudes and beliefs regarding teaching nutrition as a strategy for health promotion?
3. What are the prelicensure baccalaureate nursing faculty members' current instructional practices regarding teaching nutrition for health promotion?
4. Are there correlations among prelicensure baccalaureate faculty members' level of content knowledge, attitudes, beliefs, and/or instructional practices?

Significance and Importance to Nursing

Nurses are well-positioned to help address the growing problem of diet-related chronic disease through the provision of health-providing nutritional guidance within their scope of practice. However, nutrition education in undergraduate nursing programs is undervalued and under-prioritized; furthermore, it does not emphasize the competencies and knowledge required for providing health-promoting nutritional guidance (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Kris-Etherton et al., 2014; Livne, 2019; Sacks, 2017). There is an emerging need for the nursing profession to clarify its role in impacting health through nutrition-related care and counseling.

Academic nursing has an opportunity and a responsibility to ensure that the nursing workforce is prepared with the knowledge and skills necessary to improve the health of individuals and populations. Nursing faculty must ensure that graduates achieve competencies in the domains of health promotion and wellness (AACN, 2019; AACN, 2021; ANA, 2021). This research provides foundational knowledge that will assist in this objective by describing faculty characteristics that may either help or hinder curricular integration of nutrition for health promotion content and documenting curricular and pedagogical gaps.

By establishing this knowledge base, curricular revisions that are aligned with the new *AACN Essentials* (2021) can be better made. Prelicensure nursing programs must prepare graduates who can demonstrate competence in their professional roles upon graduation (ANA, 2021; AACN, 2021). Since the registered nurse is expected to implement strategies that promote health and wellness (ANA, 2021) and nutrition is

integral to health and wellness (ODPHP, 2020), nursing faculty must be willing and able to incorporate nutrition for health promotion into prelicensure nursing educational programs.

The findings of this study provide the groundwork that will assist nursing faculty in prelicensure programs in identifying interventions that will promote curricular integration of this critical content. By considering the findings of this research, these interventions can be better targeted to address the real underlying issues that may hinder curricular integration, namely faculty beliefs about ability, knowledge, and opportunity to teach nutrition for health promotion. Professional faculty development in nutrition for health promotion may be necessary to increase the knowledge and confidence needed in order for faculty to be comfortable teaching the content; additional resources (standard curriculum or teaching materials) may also be required.

Curriculum revision requires faculty first to understand what gaps exist in both content and pedagogy (Billings & Halstead, 2020). This study brought to light specific curricular and pedagogical gaps that will inform the efforts of nursing faculty to intentionally build innovative curricula that incorporate evidence-based content and proven instructional strategies. The gaps in the curriculum point to the need for interprofessional collaboration with nutrition experts to ensure evidence-based and up-to-date curricula. This research may also inform future endeavors to standardize nutrition competencies in nursing education through the development of a model curriculum and established performance-based indicators. This research is the first known to describe the state of nutrition education in nursing programs as it specifically pertains to health

promotion. It provides a foundation of new knowledge upon which academic nursing can build standards for improving nutrition education. These improvements are essential if the nursing workforce is to participate in addressing the growing problem of diet-related morbidity.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The current study aims to describe prelicensure baccalaureate nursing faculty members' content knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. This chapter discusses a comprehensive review of the literature pertaining to nutrition education in nursing and the knowledge, attitudes, and beliefs of nurses regarding nutrition-related nursing care. Additionally, the theoretical framework that guided this study is presented.

Literature Review

A comprehensive search of the literature was conducted to locate research describing the status of nutrition as a topic in prelicensure nursing programs, as well as nurses' and nursing faculty members' knowledge, attitudes, and beliefs regarding nutrition and the provision of nutrition-related nursing care. Databases searched included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Proquest, Academic One Complete, Education Source, and Educational Resources Information Center (ERIC), using combinations of the following keywords: *nurse or nursing faculty or nurse educator, nutrition or diet, nursing curriculum, nutrition education, nursing education, nutrition teaching, teaching, knowledge, attitude, belief*. Initially, a date delimiter of 10 years was used but was later removed due to the small number of relevant U.S. studies found. Several more studies were found through a comprehensive, manual review of reference lists from the relevant studies found through the database search. Studies were excluded if they focused solely on enteral nutrition, parenteral nutrition, or treatment of

severe malnutrition. Additionally, studies focusing on advanced nursing practice or that did not include nurses in the sampled population were excluded. The findings of the literature search are presented in this section.

Nutrition for Health Promotion

Human nutrition is a broad concept concerning the obtainment of nourishment needed for the body's physiological and biochemical functioning (Chakrabarty & Chakrabarty, 2019; Gropper et al., 2022). Adequate nutrition is foundational for sustaining life, providing the substrates for cellular energy production and the necessary co-factors required for the regulation of all physiological processes of the body (Alkerwi, 2014; Chakrabarty & Chakrabarty, 2019; Gropper et al., 2022). Nutritional issues in patient care span many sub-topics, including malnutrition, specific nutrient deficiencies, condition-specific diets, and obesity (Chakrabarty & Chakrabarty, 2019). Although nurses are concerned with all aspects of nutrition, nutrition for health promotion is the nutritional content sub-topic upon which this research is focused.

Nutrition for health promotion is concerned with optimizing nutritional intake for overall wellness (Chakrabarty & Chakrabarty, 2019; Harkin, 2018; ODPHP, 2020). It refers to a pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease (Chakrabarty & Chakrabarty, 2019; Dernini & Berry, 2016; ODPHP, 2020; Romagnolo & Selmin, 2016; USDA, 2020). Additionally, nutrition for health promotion includes avoiding the intake of food or food-like substances that are known to contribute to poor health (Chakrabarty & Chakrabarty, 2019; Dernini & Berry, 2016;

Romagnolo & Selmin, 2016; USDA, 2020). Research has provided a rich base of evidence for eating patterns that promote health and prevent disease (Dernini & Berry, 2016; ODPHP, 2020; Romagnolo & Selmin, 2016; USDA, 2020). Additionally, such eating patterns are feasible across cultural, developmental, and socioeconomic differences (Dernini & Berry, 2016; ODPHP, 2020; Romagnolo & Selmin, 2016; USDA, 2020). Nursing care, by definition, is oriented toward optimizing the health and well-being of its recipients (ANA, 2021). Since nutrition is inextricably linked with health, academic nursing is obliged to include nutrition concepts in preparatory nursing education programs (AACN, 2019).

Evolution of Nutrition Education in Prelicensure Nursing Programs

Nutrition has long been considered an essential aspect of nursing care since Florence Nightingale recognized its importance in patients' overall health during the Crimean War (DiMaria-Ghalili et al., 2014). The first formal nursing training programs in the United States, instituted in the late 1800s, included instruction on food and cooking, required a rotation in the "diet kitchen" and a course on "invalid cookery" (Englert et al., 1986, pp. 522-523). In the early 1900s, the forerunners of the National League for Nurses (NLN) and the American Nurses Association (ANA), out of a growing concern for declining admissions standards to nursing training programs, successfully established standards for examination and registry that required nurse training programs to include certain curricular elements, including nutrition (Englert et al., 1986). By 1937, nutrition content in many nursing education programs was delivered in dedicated nutrition courses and included about 100 hours of instruction (in a three-year program). Nutrition content

included techniques of food preparation and concepts of nutrition and diet therapy (Englert et al., 1986).

Changes in Nutrition Education Mid-1900s to Present

The science of dietetics as a unique discipline originated in the early 1900s. It expanded rapidly between the 1950s and 1970s, leading to role confusion between dietitians and nurses regarding nutrition-related patient care (Englert et al., 1986). In the early 1950s, the lay public, hospital administrators, and nursing education administrators generally believed that a dietitian was responsible for planning and ordering a patient's meals, while the nurse was responsible for providing nutritional advice (Englert et al., 1986). By the mid-1960s, however, nursing care was changing in response to the rapid expansion of medical treatments and technology (Englert et al., 1986). Nurses increasingly delegated their nutrition-related duties to dietitians (Englert et al., 1986). In response, the preparatory education of dietitians evolved to emphasize diet teaching; thus, dietitians increasingly became the source of diet counseling for patients, whereas the nurse's role in nutritional advice declined (Englert et al., 1986). This trend contributed to a diminishing emphasis on nutrition in nursing education programs (Englert et al., 1986).

Also in the 1950s, nursing education programs in the United States were reducing overall hours of classroom instruction and increasing hours of practical clinical instruction, which prompted many state boards of nursing to lower the mandatory dedicated classroom hours of nutrition content in curricula from 100 to 65 and others to eliminate a mandate altogether (Englert et al., 1986). Many state boards of nursing

proposed an integrated approach, where nutrition principles are interwoven throughout the nursing curriculum instead of treating it as a separate course or courses (Englert et al., 1986). Additionally, the increase in theoretical and technical knowledge needed to provide nursing care caused nurse educators to remove any content deemed unnecessary or less important from the curriculum. Since nutrition had already been established as content suitable for integration, many nursing programs eliminated separate nutrition courses and moved nutrition content into the curriculum at large (Englert et al., 1986). These changes and the increased role of dietitians in nutrition-related care led many state boards of nursing to eliminate any requirement of a specific number of instructional hours in nutrition or diet therapy (Englert et al., 1986). Reflecting the de-emphasis of nutrition in nursing education, nursing licensure exam regulators reduced the number of specific nutrition-related questions. For example, in 1972, 8-10% of the test consisted of nutrition-based questions, whereas in 1982, only 5% pertained to nutrition (Englert et al., 1986).

Nutrition Education in Nursing-Empirical Evidence

A descriptive study conducted in the late 1980s in the United States revealed that though baccalaureate nursing programs included nutrition in the curriculum, there was a great deal of variability among the specific nutritional sub-topics included as well as the structure of the nutritional curriculum (Stotts et al., 1987). A total of 54% of programs required a separate nutrition course, and the remainder integrated nutrition education throughout the curriculum (Stotts et al., 1987). Classroom hours devoted to nutrition varied widely from 0 to 100 hours ($M = 32$ hours, $SD 21.5$ hours), and 70% of schools

had zero hours of laboratory or clinical time dedicated to nutritional instruction. The content most frequently taught was nutritional assessment (96%) and enteral/parenteral nutrition (85%). *Diet counseling* was included in 84% of programs, though the authors did not define or objectively describe what was meant by diet counseling. As such, it is not possible to know how exactly respondents might have interpreted the broad concept of diet counseling (Stotts et al., 1987).

A strength of the study by Stotts et al. (1987) is its large sample size ($n = 264$) and response rate (58.7%). It should be noted that although the study aimed to examine generally the topic of nutrition in baccalaureate nursing programs, the study was sponsored by the American Society for Parenteral and Enteral Nutrition (ASPEN), and the authors' discussion emphasized parenteral and enteral nutrition topics in nursing education. Stotts et al. (1987) did not specifically ask any questions related to the subtopic of nutrition for wellness or health promotion. This study did not attempt to describe the outcomes of nutrition education, such as knowledge attainment or practical competency (Stotts et al., 1987).

Current State of Nutrition Education in Nursing

Today, there are no detailed or specific requirements imposed by any state board of nursing or accreditors of nursing education programs for nutrition education (ACEN, 2017; CCNE, 2024; DiMaria-Ghalili et al., 2014). The CCNE uses the AACN Essentials (2021) as a framework for curriculum requirements, which does not contain the words *nutrition* or *diet*. The word *food* is found once in the definition of wellness and well-being (AACN, 2021). The ACEN does not require its accredited nursing education programs to

use any one curriculum guide; instead, it allows programs to choose their own (N. Ard, personal communication, September 22, 2022). As such, accreditation standards do not contain any explicit direction or mandate regarding nutrition education in nursing.

Though accrediting organizations in the United States do not prescribe the curriculum, they are charged with ensuring effective educational processes in pre-licensure nursing education programs. Furthermore, they hold nursing education programs accountable for achieving measurable quality outcomes, including meeting benchmarks for licensure pass rates (ACEN, 2017; CCNE, 2024; NCSBN, 2022), making the licensure test blueprint a *de facto* curriculum guide of sorts.

Nutrition is testable content on the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Nutrition-related nursing care task statements included on the NCLEX-RN test blueprint include *providing parenteral nutrition, assessing nutritional status, provide client nutrition through tube feedings, evaluate the impact of disease on nutritional status, and providing client education* (NCSBN, 2022). Providing nutritional guidance for health promotion is not explicitly addressed in the NCLEX-RN test blueprint. However, the general topic of *provide care and education* is included within the client-need category of *Health Promotion and Maintenance*. Since nutrition is tested on the NCLEX-RN, undergraduate nursing programs are assumed to include nutritional content in curricula. A recent survey of nursing faculty perceptions confirms this assumption (Chao et al., 2020). However, whether nutrition in undergraduate nursing education leads to meaningful knowledge acquisition is unclear. Studies that examined

nursing students' nutrition knowledge inform the research problem and are reviewed in the next section.

Nursing Students' Nutrition Knowledge

The literature search revealed seven studies that aimed to determine if prelicensure nursing programs facilitated the attainment of adequate nutrition knowledge among graduates (Buxton & Davies, 2013; Chepulis & Mearns, 2015; Laing & Crowley, 2021; Lindseth, 1989; Mancin et al., 2023; Yfanti et al., 2011). Findings from these sources will be analyzed and synthesized.

U.S. Nursing Students' Nutrition Knowledge

Nutrition knowledge of nursing students in the United States has not been studied recently, but an older study revealed gaps in nutrition knowledge. This cross-sectional, descriptive study carried out in the Midwest of the United States found that in a sample of students ready for graduation ($n = 129$), the mean nutrition knowledge score on a previously validated test of general nutrition knowledge was 60% (range 51%-69%) (Lindseth, 1989). Compared to nutrition knowledge scores from older studies (Henderson-Sabry et al., 1987; Vickstrom & Fox, 1976), the researcher concluded that the scores indicated inadequate nutrition knowledge for providing health-promoting nutritional advice to clients (Lindseth, 1989). Students with 16 hours or more of clinical time in the senior year had higher nutrition knowledge scores (61%) than students with fewer than 16 hours (56%, $r = 0.30$, $p = 0.02$, $n = 56$). Additionally, though not statistically significant ($r = 0.24$, $p > 0.05$), students who had a separate nutrition course scored higher on the nutrition knowledge test than those who experienced nutrition

content as integrated content (Lindseth, 1989). The small sample size and narrow setting (Midwest United States) limit generalizability.

Non-U.S. Nursing Students' Nutrition Knowledge

Non-U.S. studies measuring nursing student nutrition knowledge as a marker of curricular adequacy reveal that nutritional knowledge is likely inadequate, much like the findings of the Lindseth (1989) study. In Ghana, a descriptive study using a previously validated nutrition knowledge test reported that undergraduate nursing students in the third or final year of a four-year nursing program ($n = 166$) had an average mean nutrition knowledge score of 44.8%, described as "below average" by the researchers. The researchers classified the nutrition knowledge score of one-third of the respondents as inadequate (Buxton & Davies, 2013). Another study describing the nutrition knowledge of nursing students ($n = 506$) in Greece did not include the calculation of an overall nutrition knowledge score. Still, it noted gaps in basic nutrition knowledge pertaining to the prevention of cardiovascular disease (Yfanti et al., 2011). Likewise, a comparative descriptive study of nursing students ($n = 197$) in New Zealand aiming to identify nutrition knowledge gaps reported an average overall nutrition score of 55% (range 40%-70%) (Chepulis & Mearns, 2015). Though the authors of this study used a self-made survey and did not describe any attempts to validate the instrument statistically (Chepulis & Mearns, 2015), the findings of low nutrition knowledge among nursing students are consistent with the findings of the other studies (Buxton & Davies, 2013; Lindseth, 1989; Yfanti et al., 2011).

Systematic and integrative reviews confirm the premise that nursing students have low levels of nutrition knowledge. Laing & Crowley (2021) conducted an integrative review aimed at determining if nurses are adequately prepared to provide nutrition-related nursing care to clients by evaluating empirical studies that measure undergraduate student nurses' nutrition knowledge and nutritional self-care. The authors reviewed studies from Europe ($n = 4$), Africa ($n = 3$), and Asia ($n = 3$). All of the studies reviewed by Laing & Crowley (2021) measured nursing students' nutritional knowledge, though the research questions, instruments, and nutritional content sub-topics varied. Only one included study used a validated survey instrument (Parker et al., 2011). Consistent with the findings in primary research studies (Buxton & Davies, 2013; Chepulis & Mearns, 2015; Lindseth, 1989; Yfanti et al., 2011), Laing & Crowley (2021) also identified a predominant theme of inadequate nutritional knowledge among nursing students. The authors concluded that nursing students lack the foundational nutrition knowledge necessary to provide effective nutrition-related nursing care to patients and that current nutrition education in prelicensure nursing programs is "insufficient to meet the needs of nurses as future health professionals to provide nutrition care appropriate to the needs of patients..." (Laing & Crowley, 2021, p. 6).

Mancin et al. (2023) conducted a systematic review of descriptive studies that aimed to document the nutrition knowledge of nursing students as it pertains to self-care. The authors reviewed 23 studies conducted between 2009 and 2022. A rigorous process was used to evaluate each included study for bias and methodological quality. Consistent with the Laing & Crowley (2021) review, this review found that few students

demonstrated adequate basic nutrition knowledge. Additionally, the authors reported that active teaching strategies are more effective than passive strategies in nutrition education.

To conclude, in the studies that measured nursing students' nutrition knowledge, all concluded that nursing students do not attain adequate nutrition knowledge in their prelicensure education to meet the nutritional needs of their patients (Buxton & Davies, 2013; Chepulis & Mearns, 2015; Laing & Crowley, 2021; Lindseth, 1989; Mancin et al., 2023; Yfanti et al., 2011). Though research reveals that nutrition education in nursing likely does not result in adequate levels of nutrition knowledge, there are gaps in the literature. First, there is a lack of current research that measures nursing students' nutrition knowledge in the United States, and studies conducted in other countries may not be generalizable to a U.S. population. Secondly, given the broad scope of sub-topics included in nutrition knowledge studies, it is not known if current instructional practices used in nursing programs effectively facilitate the knowledge or competencies needed specifically for providing health-promoting nutritional guidance to patients. The literature describing what is known about current instructional practices regarding nutrition education in prelicensure nursing programs is reviewed in the following section.

Current Instructional Practices

Three current studies were found that aimed to describe the curriculum and teaching methodologies used to provide nutrition education in prelicensure nursing programs, and these are reviewed in this section (Chao et al., 2020; Egleseer et al., 2018; Sodjinou et al., 2014).

Instructional Practices in the United States

Chao et al. (2020) conducted a nationwide, cross-sectional descriptive study ($n = 50$ programs) to describe nursing faculty perceptions of nutrition education in baccalaureate nursing programs. They found that 72.9% of programs require a separate course in nutrition (compared to 54% in the Stotts et al. [1987] study), and 68.6% of schools included at least 25 hours of nutrition education (Chao et al., 2020). Nutrition topics most commonly included in the curricula were focused on nutritional needs in hospitalized patients (such as enteral and parenteral nutrition) (98%), preventing malnutrition in acute illness or post-operative patients (98%), and preventing malnutrition in older adults (95%). The topics least commonly included were nutritional genomics (26.8%), food sciences (27.5%), and nutritional epidemiology (30.8%). *Nutrition counseling* was included in approximately 68% of programs, and *obesity treatment* in about 70% (Chao et al., 2020). The researchers did not ask specifically about nutrition for health promotion or wellness. Only 35.7% of respondents agreed that their students were adequately prepared to counsel patients about changing diet behaviors. However, 59.5% agreed that nutrition instruction was sufficient (Chao et al., 2020), suggesting that some faculty may not believe that dietary counseling is an essential aspect of nursing care. As with the Stotts et al. (1987) study, *dietary counseling* was not defined by the authors (Chao et al., 2020). Faculty identified barriers to improving nutrition instruction, including time constraints, higher-priority content, lack of a standard curriculum, and insufficient numbers of qualified faculty (that is, faculty with requisite knowledge and counseling skills) (Chao et al., 2020).

Conclusions from Chao et al.'s (2020) study are limited due to a low response rate (35%), variations in the definition of nutrition education among respondents, and restricted generalizability (majority of respondents were from private schools [55.1%] and urban/metropolitan areas [61.2%]). Despite these limitations, their findings suggest that baccalaureate nursing programs may have increased the number of separate nutrition courses and the hours dedicated to nutrition education since the late 1980s. However, there remains an emphasis on acute care nutritional topics with lesser or unknown emphasis on topics that pertain to nutrition for health promotion. Furthermore, almost 40% of nursing faculty agreed that overall nutrition instruction is insufficient, and 65% of nursing faculty did not agree that graduates are adequately prepared to counsel patients about their diet (Chao et al., 2020). The Chao et al. (2020) study is the only current U.S. study that described nutrition-related instructional practices in prelicensure nursing education.

Non-U.S. Instructional Practices

Researchers in West Africa surveyed faculty and administrators of medical, nursing, and midwifery schools ($n = 127$ training programs in 12 countries; $n = 51$ nursing programs) to assess the status of nutrition education in pre-service healthcare education (Sodjinou et al., 2014). They found that nutrition education in nursing programs is primarily lecture-based, delivered in a dedicated nutrition course (78%) early in the program, with very few opportunities for practical application in a clinical setting (Sodjinou et al., 2014). Less than six hours of instructional contact were devoted to "public health nutrition" (Sodjinou et al., 2014, p. 1). In contrast with the Chao et al.

(2020) study, in which the most emphasized nutrition content was related to acute care nutritional issues, the nutritional content area most heavily emphasized in the West African study was basic nutritional science (74% of instructional time). Furthermore, 55% of respondents rated the quality of nutrition instruction as either inadequate or insufficient (Sodjinou et al., 2014).

A large-scale European study ($n = 131$ nursing education institutions in 31 European countries) was conducted to determine if nursing programs offering formal degrees were addressing the topic of nutrition and, specifically, the sub-topic of malnutrition in older adults (Eglseer et al., 2018). Notably, the researchers claim this is the first study to explore the formal nutrition education of nurses in Europe. It is problematic to compare this study with others due to the specific focus on malnutrition and the fact that the researchers do not describe the prevalence of other nutritional topics. However, the author's conclusion that there are gaps in the nutrition education of nurses in Europe (Eglseer, 2018) concurs with the themes of other studies reviewed (Chao et al., 2020; Sodjinou et al., 2014; Stotts et al., 1987).

Themes from the Literature Describing Nutrition Instructional Practices

In summary, a number of relevant themes emerge from the research exploring nutrition instruction and curriculum in prelicensure nursing programs. First, there is a need for further research on the inclusion of nutrition for health promotion as a distinct content area in prelicensure nursing programs, as no studies were found that examined the presence or absence of nutrition for health promotion (Chao et al., 2020; Eglseer et al., 2018; Sodjinou et al., 2014; Stotts et al., 1987). In the U.S., the evidence points to a

curricular emphasis on acute care nutritional problems and preventing malnutrition in older adults that is much unchanged from the late 1980s (Chao et al., 2020; Stotts et al., 1987).

The next important theme is the faculty perception that there are gaps in nutrition education in prelicensure nursing programs (Chao et al., 2020; Sodjinou et al., 2014). The majority of faculty respondents in the Chao et al. (2020) study did not agree that their students were sufficiently trained to counsel patients about their diet behaviors. However, a slight majority agreed that overall nutrition education was adequate. This mismatch suggests the possibility that nursing faculty in the United States may not believe that providing patients with health-promoting nutritional counseling is as important as other topics in nutrition. Lastly, there is a need to explore barriers to improving nutrition education, such as the lack of standardized nutrition curricula or established nutrition competencies for nursing programs and content saturation (Chao et al., 2020; Livne, 2019). Additionally, faculty agreed that *faculty training in nutrition* was needed to improve the teaching of nutrition (Chao et al., 2020).

To address gaps in nutrition education in nursing, nursing faculty members will need to develop and deliver evidence-based nutrition curricula using teaching methodologies that promote measurable competency attainment (AACN, 2019). The following section describes what is currently understood about nurses' knowledge, attitudes, and beliefs regarding nutrition.

Nursing Faculty Members' Knowledge, Attitudes, and Beliefs

Faculty knowledge, attitudes, and beliefs about a topic are predictors of whether or not they will include the said topic in their lessons (Ajzen, 1991; Ernest, 1989; Wilkins, 2008). In the literature search, no studies were found that described nutrition knowledge, attitudes, or beliefs of nursing faculty, aside from the Chao et al. (2020) survey of faculty perceptions previously reviewed. However, studies examining the knowledge, attitudes, or beliefs of nurses were found. These studies inform this research because nursing faculty are licensed, professional nurses who present with a similar clinical background as nurses in general (ACEN, 2017; CCNE, 2024). In other words, studies describing *nurses'* knowledge, attitudes, and beliefs related to nutrition serve as proxies for studies that would describe those characteristics in nursing faculty. The following sections describe and analyze what is currently known about nurses' knowledge, attitudes, and beliefs regarding nutrition-related nursing care.

Nutrition Knowledge

Studies that measured nurses' knowledge of nutrition are described in this section. Because of a shortage of current research on U.S. nurses' nutritional knowledge, older U.S. studies are included to provide perspective on the status of this variable in this study population.

The studies that measured nutrition knowledge vary regarding the specific nutrition sub-topics studied. Nutritional sub-topics included in the studies describing nurses' knowledge were maternal nutrition (Ilmonen et al., 2012; Mekhoa et al., 2022), nutrition needs of older adults (Bauer et al., 2015; Crogan et al., 2001; Endevelt et al.,

2009; Lindseth, 1994; Stanek et al., 1991), nutritional support for the acutely ill (Boaz et al., 2013; Kobe, 2006; Kim & Choue, 2009; Lyu et al., 2021; Perry, 1997), and general, non-specific nutrition (Hakonsen et al., 2018; Naser et al., 2021; Patil & Balai, 2021; Schaller & James, 2005). Four studies focused on nutrition knowledge of sub-topics related more closely to nutrition for health promotion, including nutrition to prevent and manage chronic disease (Al-Shwaiyat et al., 2013; Lindseth, 1990; Park et al., 2011) and nutrition for the prevention of obesity (Kable et al., 2015). An integrative review (Bakre et al., 2012) and a systematic review (Zeldman & Andrade, 2020), which included many of the older (greater than ten years) studies named above, were also analyzed.

Nurse's General Nutrition Knowledge

Several studies measured general nutrition knowledge among healthcare professionals without focusing on a particular patient population or topic. One of these, involving an author-derived survey of 449 healthcare providers (including nurses) in Denmark, found a "poor level of knowledge" (p. 6); however, the researchers did not report an average knowledge score (Hakonsen et al., 2018). In a survey of hospital-based nurses in India ($n = 200$), the mean nutrition knowledge score on a 26-item test (adapted from the Hakonsen et al., 2018 study) was 49.47% (range 15%-69%) (Patil & Balai, 2021). Naser et al. (2021) measured Palestinian nurses' general nutrition knowledge with a self-authored instrument. They identified cut points for nutrition knowledge, which were labeled poor, moderate, or high. Twenty-nine percent of nurses ($n = 96$) scored in the low category and 54.2% scored at a moderate level (Naser et al., 2021). The findings of Naser et al. (2021), Patil and Balai (2021), and Hakonsen et al. (2018) are similar to

those of Shaller & James (2005), who, using a previously validated measurement instrument developed by Henderson-Sabry et al. (1987), reported an average nutrition knowledge score of 60.2% ($SD = 8.4\%$) among 103 Australian nurses.

Nurses' Nutrition Knowledge Related to Specific Patient Populations

Studies in Kenya (Kobe, 2006) and Israel (Boaz et al., 2013), in which the same knowledge measurement tool was used (self-authored by Kobe [2006]), had similar average scores for overall knowledge of nutrition support for hospitalized patients (57% and 51.9%, respectively). Researchers in China, using a survey instrument written and validated by the authors, found that nurses working in emergency departments had an average nutrition knowledge score of 6.31/10 ($n = 688$, $SD = 1.61$), described as "moderate" by the researchers (Lyu et al., 2021). Perry (1997), using a self-authored measurement instrument, reported deficits in several key nutrition knowledge areas related to acute care, as did Kim & Choue (2009), who adapted the instrument used in Perry's (1997) study.

Knowledge deficits were also found in a large, multi-center study in Austria in which questions were asked about nutrition knowledge and attitudes of registered nurses regarding nutritional care of the elderly (Bauer et al., 2013). The nutrition knowledge score of nurses ($n = 458$) reported by Bauer et al. (2013) was 65.6% correct. This finding was similar to that of Endevelt et al. (2009), who found that nurses working in Israel ($n = 159$) had moderate knowledge deficiencies with an average score of 69%. A U.S. researcher, Lindseth (1994), adapting a previously validated instrument (Henderson-Sabry et al., 1987), reported a mean nutrition knowledge score of 64% (*range* 44-84%).

This finding aligned with the findings of other U.S studies, such as one conducted by Crogan et al. (2001), who reported an average knowledge score of 65% ($SD = 11\%$), and another conducted by Stanek et al. (1991), who reported a mean nutrition knowledge score of 60%.

Nurses' Knowledge of Nutrition for Health Promotion

Findings in studies that described nurses' nutrition knowledge in subtopics more closely aligned to nutrition for health promotion were consistent in reporting knowledge deficits. For example, a self-report survey study conducted by Al-Shwaiyat et al. (2013) sought to measure Jordanian nurses' ($n = 200$) nutrition knowledge concerning chronic disease prevention. They adapted questions from previously validated survey instruments and found that the nurses' average overall nutrition knowledge score was 58%, described by the authors as "suboptimal" (Al-Shwaiyat et al., 2013, p. 142). Eleven out of 30 questions were answered incorrectly by more than 50% of the respondents (Al-Shwaiyat et al., 2013). Similarly, knowledge deficits were found in a study by Park et al. (2011) of Korean nurses ($n = 506$), with a correct response rate of 58.4%. Nurses in an Australian study ($n = 79$) employed in either public or private healthcare organizations scored a bit higher at 68% when tested on knowledge of providing healthy lifestyle advice for overweight patients (Kable et al., 2015). However, Lindseth (1990) surveyed rural nurses in the Midwest of the United States ($n = 176$) about nutrition knowledge for health promotion and reported an average correct response rate of 32.5% (*range*: 17-42%).

Limitations of Literature on Nurses' Nutrition Knowledge

The heterogeneity in the literature is a limitation for drawing conclusions about nurses' knowledge of nutrition for health promotion. There are differences in nutrition subtopics (as previously described) and data collection regarding instruments, settings, and sample size. In terms of instruments, the descriptions of validation procedures varied. Many studies included the use of self-authored measurement instruments designed or adapted specifically for their research (Crogan et al., 2001; Endevelt et al., 2009; Hakonsen et al., 2018; Kable et al., 2015; Lyu et al., 2021; Naser et al., 2021; Park et al., 2011; Stanek et al., 1991; Theila et al., 2016). Some researchers did describe, at least minimally, attempts to validate the instrument. For example, Naser et al. (2021) authored some items with the assistance of content experts, adapted some items from previously validated questionnaires, and pilot-tested the survey in a small convenience sample before conducting the primary study (Naser et al., 2021). Reliability and construct validity were reported and deemed adequate regarding the items' overall reliability ($\alpha = .81$ in the nurse's sample). In another example, Hakonsen et al. (2018) described procedures for testing face and content validity, as well as statistical analysis of reliability ($\alpha = .56$). Patil & Balai (2021) later went on to use this instrument in their study.

Few Studies with Validated Survey Instruments

A few studies used previously validated measurement instruments. For example, a nutrition knowledge instrument developed in 1987 (Henderson-Sabry et al., 1987), designed originally to measure Canadian public health nurses' level of nutrition knowledge, was used again by Lindseth (1989, 1990, 1994), Schaller & James (2005),

and was later adapted for the study by Al-Shwaiyat et al. (2013). Bauer et al. (2015) used the validated Knowledge of Malnutrition-Geriatric (KoM-G) questionnaire. The study conducted by Boaz et al. (2013) used a previously tested nutrition knowledge measure developed by Kobe (2006), who designed it to study Kenyan nurses' nutritional knowledge related to nutritional support for acutely ill patients.

Some researchers do not fully describe efforts to use validated measures of nutrition knowledge. For example, Kim & Choue (2009) adapted a questionnaire from a previous study (Perry, 1997), but neither author provided procedural or statistical details as to the determination of the validity or reliability of the measurement instrument. The questionnaire used in Park et al.'s (2011) study was adapted from three surveys used in previous studies, which the authors reference but do not explain how they validated the instrument before use.

Themes from the Literature on Nurses' Nutrition Knowledge

Despite the limitations of the literature describing nurses' nutrition knowledge, the consistency of findings across multiple studies increases the likelihood of validity (Zeldman & Andrade, 2020). The nutrition knowledge of nurses measured globally (and previously in the United States) is low to moderate. The nurses' knowledge deficits are consistent with the findings of the studies that examined the nutrition knowledge of nursing students, which also found evidence of inadequate nutrition knowledge (Buxton & Davies, 2013; Chepulis & Mearns, 2015; Laing & Crowley, 2021; Lindseth, 1989; Mancin et al., 2023; Yfanti et al., 2011). Furthermore, the knowledge deficits noted in the literature are consistent with findings in integrative (Bakre et al., 2012) and systematic

(Zeldman & Andrade, 2020) reviews of literature that examined nurses' nutrition knowledge.

Bakre et al. (2012) found in nine of the 15 studies reviewed that nurses had deficiencies in nutritional knowledge, and that poor nutrition-related nursing care led to more extended hospital stays in two of the studies reviewed (Bakre et al., 2012). The researchers concluded that nurses' nutritional knowledge level limits their ability to provide optimal nutrition care to patients. In the Zeldman and Andrade (2020) systematic review of studies using validated nutrition knowledge measurement instruments (physicians: $n = 12$; nurses: $n = 19$; nurses and physicians: $n = 2$), the mean correct response scores overall ranged from a low of 32% (poor) correct to a high of 72% (fair) correct. In the 19 studies that measured nurses' nutrition knowledge specifically, the mean nutrition knowledge score was 56.9%, considered deficient by most experts, although a criterion reference for nutritional knowledge does not exist (Zeldman & Andrade, 2020). These researchers contend that this lack of knowledge is a barrier to providing effective nutritional interventions that improve health (Bakre et al., 2012; Zeldman & Andrade, 2020).

Research Gaps

The literature describing nurses' nutrition knowledge reveals several research gaps. Current empirical research on nurses' nutrition knowledge in the United States is lacking, given that the only U.S. studies represented in the literature were over 20 years old (Crogan et al., 2001; Lindseth, 1990; Lindseth, 1994; Stanek et al., 1991). Nurses' knowledge of nutrition for health promotion, globally but especially in the United States,

is relatively unknown, as nutrition for health promotion is not often studied. Still, in the few studies in which nutrition knowledge for health promotion was measured, the mean nutrition knowledge scores suggest that nurses do not have the requisite knowledge to provide health-promoting nutritional guidance (Al-Shwaiyat et al., 2013; Kable et al., 2015; Lindseth, 1990; Park et al., 2011). Additional study is needed to identify factors that will lead to successful initiatives to improve nutrition education (Bakre et al., 2012; Kable et al., 2015; Patil & Balai, 2021; Zeldman & Andrade, 2020).

The literature describing nurses' nutrition knowledge informed this study both by establishing what is known about nurses' nutrition knowledge and revealing research gaps. Nursing faculty are responsible for teaching nutrition concepts to nursing students, yet there is no measure of their nutrition knowledge other than what is found in the literature regarding nurses in general. An aim of the current study was to determine nursing faculty members' nutrition knowledge. In addition to nutrition knowledge, nursing faculty members' attitudes and beliefs regarding teaching nutrition for health promotion will likely impact their decisions to teach this content (Wilkins, 2008). The following section includes what was found about nurses' attitudes and beliefs regarding nutrition in the literature.

Impact of Educators' Attitudes and Beliefs on Instructional Practices

In addition to content knowledge, attitudes and beliefs about a topic predict whether or not educators are likely to include the topic in a lesson and influence the instructional practices used to teach it (Akhter et al., 2021; Ernest, 1989; Lyon & Houser, 2018; Raker, 2022; Sirota, 2013; Wilkins, 2008). Studies in which nurse educators'

attitudes and beliefs about various topics are described have corroborated this assumption. For example, Sirota (2013) examined nurse educators' attitudes toward homosexuality and found that the educators' beliefs about the importance of teaching students about homosexuality were positively correlated with their perceived confidence in being able to present the content ($r = 0.346$; $p < 0.000$; $n = 1,254$). Also, a positive attitude toward homosexuality strongly predicted the *likelihood* of teaching the content (Sirota, 2013). Lyon and Houser (2018) found that nurse educators who have positive attitudes toward people with disabilities are likely to convey this positivity to students when teaching about the care of people with disability.

Akhter et al. (2021) studied knowledge, attitudes, and skills related to high-fidelity simulation and found that nurse educators ($n = 29$) had positive attitudes toward using simulation as a teaching strategy (90.6%). Also, they believed that faculty education on high-fidelity simulation would be helpful (85.7%), suggesting that positive beliefs may influence one's efforts to learn more about a topic (Akhter et al., 2021).

Another study highlighted a connection between content knowledge and attitudes in that nursing faculty who had received training on human trafficking were more likely to have positive attitudes toward teaching the topic of human trafficking than those who received no training ($d = 1.06$, $p < 0.001$) (Raker, 2022).

Since attitudes and beliefs have been shown to influence teaching practices, it is necessary to consider the attitudes and beliefs of the target population for this study. Still, no studies were found that explicitly examined the attitudes and beliefs of nursing faculty regarding nutrition or nutrition for health promotion. However, as with the literature

review on nutrition knowledge, the findings of studies that reviewed nurses' attitudes and beliefs regarding nutrition served as a proxy.

Nurses' Attitudes and Beliefs Regarding Nutrition

In the literature concerning nurses' attitudes and beliefs regarding nutrition, it should be noted that the terms *attitude*, *belief*, and even *perception* were often used interchangeably. Also, these terms held different meanings and were measured in various ways across studies (Bauer et al., 2015; Boaz et al., 2013; Hakonsen et al., 2018; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Mekhoa et al., 2022; Naser et al., 2021; Patil & Balai, 2021; Theilla et al., 2016). Therefore, the literature describing nurses' attitudes and beliefs was analyzed in the context of the theoretical definitions of these concepts for the current study. Studies that sampled nursing faculty were not found; therefore, research that describes nurses' attitudes and beliefs regarding nutrition and nutrition for health promotion will be discussed. Many of these studies were previously reviewed in the *nurses' nutrition knowledge* section of this chapter.

Attitudes about the Importance of Nutrition and Nurse's Role

There is conflicting evidence in the literature regarding nurses' attitudes regarding the provision of nutrition-related nursing care (Bauer et al., 2015; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Mekhoa et al., 2022; Naser et al., 2021). For example, in one study, ninety-three percent of nurses agreed with the statement *diet has an important role in the prevention and treatment of disease*, but only 54% agreed that *nurses should spend more time exploring dietary/eating habits during patient care* and 29% agreed that *nutrition advice is not the responsibility of the nurse*

(Naser et al., 2021). Kable et al. (2015) found that nearly all nurses agreed that dietary counseling was important for overweight and obese patients. Still, only 68% agreed that *the provision of weight management advice to obese/overweight patients is within their scope of practice*. Another study found that nurses agreed that nutrition is vital in preventing and treating disease, but only 56% agreed that *education about nutrition for patients is the nurse's responsibility* (Lyu et al., 2021). Lastly, nurses participating in the Boaz et al. (2013) study agreed that nutrition-related nursing care is important for preventing and recovering from disease but also ranked nursing activities pertaining to nutrition as low priority and did not believe that nutrition counseling was the responsibility of the nurse.

Though multiple studies suggested that nurses do not always have positive attitudes about providing nutrition-related nursing care, some evidence contradicts this finding. Researchers in two studies that examined nurses' attitudes about nutrition-related nursing care in the context of maternal-child healthcare settings reported strongly positive attitudes regarding the importance of nutrition-related nursing care and the nurse's responsibility to provide said care (Ilmonen et al., 2012; Mekhoa et al., 2022). Additionally, in an Australian study of nurses' perceived knowledge and attitudes toward nutrition-related nursing care, researchers reported a positive attitude regarding the obligation to provide nutrition-related nursing care, with 97.6% agreeing about the importance of *advocating a healthy diet and physical activity to promote healthy body weight* and 88% agreeing to the statement *I have an obligation to improve the health of my patients including discussing nutrition information with them* (Martin et al., 2013).

In summary, empirical evidence raises questions about nurses' attitudes toward their responsibility to provide nutrition-related nursing care. This finding corroborates the claim by some experts that nutrition-related nursing care role confusion in healthcare exists across disciplines and contributes to sub-optimal nutritional outcomes (Kris-Etherton et al., 2014; Sacks, 2017). Conclusions are somewhat limited by the heterogeneity of the studies, including the different countries and cultures in which the studies took place (i.e., Australia, China, Austria, Finland, and Southern Africa). The nutritional context of the studies varied as well. For example, Boaz et al. (2013) queried nurses' attitudes regarding nutrition interventions for the hospitalized elderly, Lyu et al. (2021) studied the nutrition-related nursing care attitudes of nurses working in emergency departments, Kable et al. (2015) surveyed nurses' attitudes about providing healthy lifestyle advice, and Martin et al. (2013) studied nurses' attitudes about managing nutritional issues in chronic disease. Additionally, the instruments used to measure attitudes were unique across all studies, so care must be taken before generalizing these results to nurses in all settings.

Relationship between Nurses' Nutrition Knowledge and Attitudes

Some evidence suggests that nurses' nutrition knowledge and attitudes about nutrition-related nursing care are positively correlated. That is, nurses with higher levels of nutrition knowledge are more likely to have positive attitudes about the importance of nutrition-related nursing care and the perception that nutrition-related nursing care is part of the nurse's role (Bauer et al., 2015; Boaz et al., 2013, Mekhoa et al., 2022; Theila et

al., 2016). Studies that examined this relationship empirically are reviewed in this section.

Researchers found that higher nutrition knowledge scores were positively correlated with nurses' agreement with statements such as *nutrition prevents illness* ($r = 0.25, p = 0.01$) and *nutrition has an important role in recovery from illness* ($r = 0.22, p = 0.02$) (Boaz et al., 2013). Nutrition knowledge scores were inversely correlated with the number of respondents who agreed with the statement that *nutrition counseling is not the responsibility of the nurse* ($r = 0.31, p = 0.001$). In other words, nurses with lower nutrition knowledge scores were more likely to agree with this statement (Boaz et al., 2013). A study conducted in Tel Aviv found that hospital-based nurses' ($n = 415$) mean nutrition knowledge scores were positively correlated with their attitudes regarding the *importance of nutritional assessment* ($R = 0.29, p < 0.001$) (Theila et al., 2016).

Another study found that 88.3% of nurses ($n = 120$) had both high nutrition knowledge and positive attitudes about the importance of nutrition-related nursing care, as well as the nurse's role in providing nutritional guidance (Mekhoa et al., 2022). For example, 96.7% of respondents agreed that *good maternal nutrition is important for a successful pregnancy*, and 95% agreed that *educating women on the importance of healthy eating during pregnancy is one of the responsibilities of a nurse*. However, correlations between nutrition knowledge and attitudes in this study did not reach statistical significance ($r = 0.112$, non-significant) (Mekhoa et al., 2022).

One study found no relationship between nutrition knowledge score and attitudes about nutrition-related nursing care or the nurse's role ($F(2,305) = 0.907, p < 0.745, R^2$

0.006); however, this statistic included data from both nurses and unlicensed assistive personnel (UAP) in the sample (Hakonsen et al., 2016) and it is not known how combining the two different healthcare providers might have impacted the results.

In summary, there is evidential support for the premise that higher levels of nutrition knowledge are associated with positive attitudes about the importance of nutrition-related nursing care and the nurse's role in providing said care; however, the evidence is not conclusive. Also, no studies were found that aimed to describe the relationships between nutritional knowledge and attitudes in the context of nutrition for health promotion, thus revealing a research gap.

Nurses' Beliefs About Nutrition-Related Nursing Care

As with the search for evidence regarding attitudes, studies describing nursing faculty members' beliefs about teaching nutrition for health promotion were not found. However, studies that described nurses' beliefs about nutrition more generally provide relevant information to inform this research, again noting that nursing faculty are nurses who come from direct patient care backgrounds.

One's belief that one possesses the knowledge, skills, or confidence to perform a behavior or task successfully predicts whether or not one will endeavor to perform it (Ajzen, 1991). Research suggests that nurses may lack confidence in their ability to provide nutrition-related nursing care and counseling (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Naser et al., 2021). Kable et al. (2015) reported that 70% of nurses ($n = 79$) were not confident in their ability to provide nutritional advice, assess diet, or make dietary recommendations for patients who

are overweight. Lack of knowledge, access to resources, lack of counseling skills, and unclear role responsibilities regarding nutritional counseling were cited as barriers to providing health-promoting nutritional guidance (Kable et al., 2015). Martin et al. (2013) also confirmed nurses' low confidence in providing nutrition-related nursing care, reporting that 56.4% of nurses ($n = 181$) were unsure of their effectiveness in providing health-promoting nutritional guidance. Forty percent of these nurses either disagreed or were unsure when considering the statement, *I believe I have enough knowledge to provide nutrition advice to patients*, and 41% disagreed with or were unsure about *I feel competent in providing nutrition advice...for patients living with chronic disease* (Martin et al., 2013). Sixty percent of nurses ($n = 327$) in another study reported that nutrition counseling was difficult due in part to knowledge deficits and a lack of counseling skills (Ilmonen et al., 2012). Sixty-one percent of nurses ($n = 688$) in the Lyu et al. (2021) study named *not having enough knowledge* as a personal barrier to providing nutrition support. Naser et al. (2021) reported that 74% of nurses ($n = 96$) had negative or neutral responses to the statement *most nurses are very knowledgeable about nutrition*. Lastly, in the Boaz et al. (2013) study, more than 50% of the nurses ($n = 106$) disagreed with the statement *nurses possess a great deal of nutrition knowledge*.

Collectively, the research suggests that many nurses do not believe that they have the knowledge or skills needed to provide nutrition-related nursing care, thus decreasing the nurses' confidence in their abilities to provide nutrition-related nursing care or counseling (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Naser et al., 2021). This finding aligns with the finding discussed

previously that nursing faculty believe that inadequate nutrition knowledge is a barrier to improving nutrition education in baccalaureate nursing programs (Chao et al., 2020). However, a research gap exists in that no study examined the beliefs of nursing faculty regarding teaching nutrition for health promotion.

Summary of Literature Review

The literature review provides a perspective on the evolution of nutrition as a curricular element in nursing education and reveals several important themes about nurses' nutrition knowledge, attitudes, and beliefs. Nutrition education in prelicensure nursing programs tends to focus on topics pertaining to the nutritional needs of the acutely ill and those with specific disease states (Chao et al., 2020). To what extent nutrition for health promotion is taught in prelicensure baccalaureate nursing programs is unknown. Research suggests that nursing faculty do not perceive nutrition education as sufficient for graduates to attain the knowledge and skills needed to provide nutritional guidance to patients (Chao et al., 2020; Sodjinou et al., 2014). Perceived barriers to teaching nutrition in nursing programs include a lack of adequate knowledge, the opinion that nutrition is less important than other content, role confusion, and lack of time or resources (Chao et al., 2020). These findings are corroborated by findings in the literature related to nurses' knowledge, attitudes, and beliefs regarding nutrition-related nursing care.

There is a lack of research examining nursing faculty members' knowledge, attitudes, or beliefs related to nutrition or nutrition for health promotion. However, research that explored nurses' nutrition knowledge was consistent in that nurses'

nutritional knowledge is generally less than optimal (Al-Shwaiyat et al., 2013; Bakre et al., 2012; Bauer et al., 2015; Boaz et al., 2013; Hakonsen et al., 2018; Ilmonen et al., 2012; Lyu et al., 2021; Martin et al., 2013; Naser et al., 2021; Patil & Balai, 2021; Zeldman & Andrade, 2020). Furthermore, although attitudes about the importance of nutrition-related nursing care are generally positive (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Mekhoa et al., 2022; Naser et al., 2021), many nurses believe they lack the necessary knowledge, skills, and confidence to provide effective nutrition-related nursing care to patients (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Naser et al., 2021). Additionally, there is disagreement about who is responsible for nutritional counseling (Boaz et al., 2013; Kable et al., 2015; Lyu et al., 2021; Naser et al., 2021).

U.S. nurses' knowledge, attitudes, and beliefs regarding nutrition-related nursing care are relatively unknown as they are not represented in any research conducted in the last ten years. Knowledge, attitudes, and beliefs are direct and indirect predictors of instructional practices among educators (Wilkins, 2008), so it is necessary to understand these characteristics of nursing faculty in order to improve nutrition education in prelicensure nursing education. This study aims to fill a research gap by describing nursing faculty members' knowledge, attitudes, beliefs, and practices regarding teaching nutrition for health promotion in prelicensure baccalaureate nursing programs. The following section will describe the theoretical foundation for the study.

Theoretical Framework

A theoretical framework provides rationale and structure for the selection of research questions and informs research design (Portney, 2020; Younas & Quennell, 2019). It also supports the analysis and application of the results (Grant & Osanloo, 2014). Since this study aimed to explore the factors that affect a faculty member's instructional practices (behavior) regarding the teaching of nutrition for health promotion, a behavioral theory is a suitable foundation. The theory of planned behavior (Ajzen, 1985; Ajzen, 1991) supports the assumptions about behavior that underlie the premise of this study and provides theoretical definitions for some of the variables. Additionally, a theoretical model for education developed by Wilkins (2008) will be used to describe possible interrelationships among the study variables, thus informing the definitions of variables not addressed in the theory of planned behavior and supporting the research questions. Together, elements from the theory of planned behavior (Ajzen, 1985; Ajzen, 1991) and Wilkins's (2008) model provide the foundation for this study. This section explains the application of the theory of planned behavior (Ajzen, 1985; Ajzen, 1991) and Wilkins's (2008) model to this study.

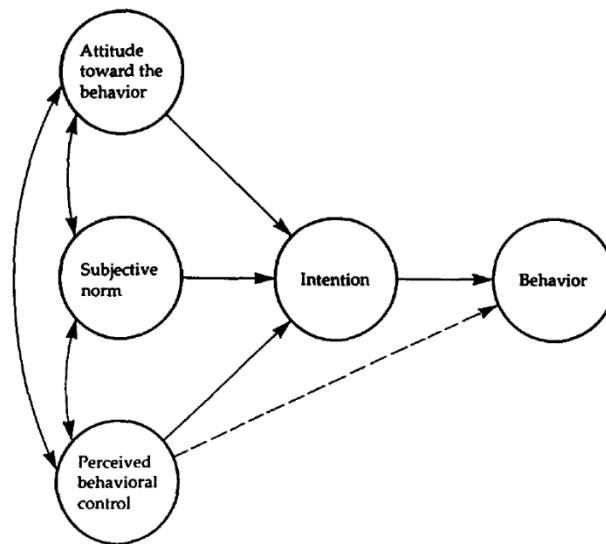
Theory of Planned Behavior

The theory of planned behavior, a middle-range behavioral theory, is a predictive theory that explains the intent to perform a behavior over which an individual can exert self-control (Ajzen, 1985; Ajzen, 1991). It has been used as a framework not only in individual health-behavior research (Adams et al., 2022; Lareyre et al., 2021; McDermott et al., 2015; Rich et al., 2015) but also in organizational (Arifin et al., 2021; Tsai et al.,

2022), commercial (Dorce, L., 2021; Ulker-Demirel, & Ciftci, G., 2020), and educational (Leighton & Griffion, 2021; LePage et al., 2015; Nguyen et al., 2019; Pierce, 2018) research to understand the motivation for behavior and inform interventions aiming to modify behavior. In the theory of planned behavior, six constructs (attitudes, behavioral intention, subjective norms, perceived power, and perceived behavioral control) collectively impact one's intention to perform a behavior. Of those, three are considered to have the most significant impact: attitude, subjective norms, and perceived behavioral control, as shown in Figure 1 (Ajzen, 1991; Lepage et al., 2015).

Figure 1

Theory of Planned Behavior



Note: From "The Theory of Planned Behavior," by I. Ajzen, 1991, *Organizational Behavior and Human Decision Processes*, 50, 179-211. Copyright 1991, by the University of Massachusetts.

Beliefs in the Theory of Planned Behavior

In the theory of planned behavior, beliefs about a behavior or action are formed by associating it with certain attributes, that is, other objects, events, or characteristics. The theory of planned behavior describes three types of beliefs that influence one's behavior, namely, normative beliefs (subjective norm), internal and external control beliefs (perceived behavioral control), and behavioral beliefs (attitude) (Ajzen, 1991; Ajzen, 2002). Detailed descriptions of these concepts are provided in this section.

Normative Beliefs

Normative beliefs form the basis for subjective norm, the perceived social pressure to perform (or not perform) a behavior (Ajzen, 1991). Subjective norms arise from one's perception that significant people or groups approve (or disapprove) of a behavior (Ajzen, 1991). In addition to perceived approval, subjective norms may also arise from the perceived expectations of important people or groups. Subjective norm is an antecedent for planned behavior; that is, one's perception that a behavior is approved of or expected will impact the decision to perform it (Ajzen, 1991).

Control Beliefs

Another predictor of behavioral intention in the theory of planned behavior is perceived behavioral control. Perceived behavioral control is defined as the perceived ease or difficulty of executing the behavior and is linked to *control beliefs*, which are beliefs that may either help or hinder the ability to perform the behavior (Ajzen, 1991; Ajzen, 2002). Control beliefs are related to the perception that resources and opportunities needed to perform the behavior are either present or absent (Ajzen, 1991;

Ajzen, 2002). Ajzen (2002) later refined the concept of control beliefs and divided it into internal and external control beliefs. Internal control beliefs are related to the perceived knowledge, skills, or confidence needed to perform a behavior and external control beliefs are related to the presence or absence of other resources, such as time or necessary materials; additionally, system or organizational barriers may comprise external control beliefs (Ajzen, 2002).

Theoretical Definition of Beliefs

Beliefs in this study were defined as *perceptions about teaching nutrition for health promotion that nursing faculty accept as true, including internal factors (perceived ability, confidence), external factors (time, resources), and social expectations* (Ajzen, 1991; Ajzen, 2002; Oxford University Press, 2023). This definition arises from the assumptions that the intent to perform a behavior is influenced by perceived behavioral control and social norms (Ajzen, 1991; Ajzen, 2002). Theoretical and operational definitions for all study variables are found in Appendix A.

Attitude in the Theory of Planned Behavior

Ajzen (1991) defines *attitude* as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (p. 188) and arises from behavioral beliefs. Attitude toward a behavior predicts intention to undertake said behavior, and intention is a necessary precursor to actually carrying out the behavior (Ajzen, 1985; Ajzen, 1991; Ajzen, 2001). A notable distinction is that attitude towards the behavior itself is considered separately from attitudinal beliefs about the *outcome* of the behavior. Behavioral beliefs are those that reflect the perceived positive and negative

consequences of the behavior. In other words, these are beliefs that link the behavior to its outcome or some other attribute of the behavior, such as the benefit or cost to the one performing it (Ajzen, 1991). Since the outcome and attributes of behavior are viewed positively or negatively, one learns to prefer behaviors that will lead to desirable consequences and avoid behaviors that will produce undesirable consequences (Ajzen, 1991). Behavioral beliefs are thought to be the foundation for one's attitude toward the performance of an action, task, or behavior, and Ajzen (1991; 2001) sometimes used the terms interchangeably.

Theoretical Definition of Attitude

Attitude was defined as *an appraisal of the effect of nursing faculty teaching nutrition for health promotion, characterized on a continuum from positive to negative* (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002). This definition arises from the assumption in the theory of planned behavior that the intention to perform a behavior is influenced by positive and negative associations with the behavior *and* with the outcome of the behavior (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002). Theoretical and operational definitions for all study variables are found in Appendix A.

The theory of planned behavior provides a foundation for defining the variables of attitude and beliefs; however, it is a general behavioral theory and not explicitly oriented to education. Additionally, the theory does not describe the impact of knowledge on the intention to perform a behavior. Ernest (1989) hypothesized, and Wilkins (2008) tested a theoretical model to explain how content knowledge, attitudes, and beliefs affect the instructional practices of mathematics teachers. This model describes and predicts the

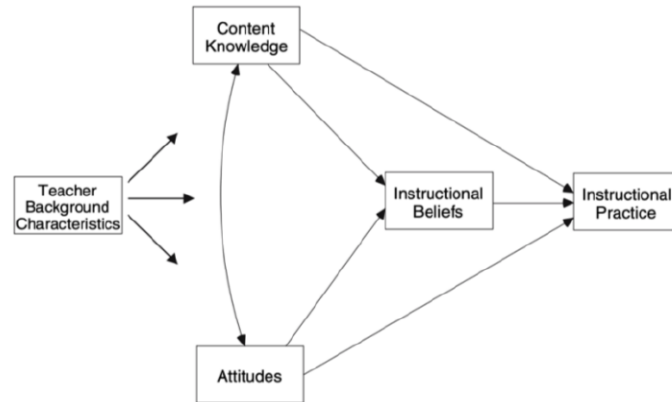
relationships among teachers' content knowledge, attitudes, beliefs, and instructional practices.

Wilkins' Knowledge, Attitudes, Beliefs, and Practices (KABP) Model

Ernest (1989) hypothesized that in order to facilitate an educator's adoption of curricular change and innovative teaching strategies, it is necessary to understand how content knowledge, attitudes, and beliefs will impact the chosen instructional practices of the educator. Wilkins (2008), using the conceptual model proposed by Ernest (1989), designed a large-scale, multi-site ($n = 481$) study that showed educators' instructional practices are directly and indirectly influenced by content knowledge, attitudes, and beliefs about effective instruction; additionally, that beliefs mediate the effects of knowledge and attitudes on instructional practices. Wilkins's (2008) hypothesized path model is shown in Figure 2. Wilkins (2008) designed and validated an instrument that measured math teachers' content knowledge ($KR20 = .88$), attitudes ($\alpha = .88$), beliefs ($\alpha = .80$), and instructional practices ($\alpha = .87$) related to the usage of inquiry-based instruction in the teaching of mathematics and integration of a standards-based mathematics curriculum. After data collection, Wilkins (2008) used exploratory path analysis to evaluate the strength of relationships among the independent variables (knowledge, attitudes, and beliefs) and the direct and indirect effects on the dependent variable (instructional practices) (Mertler & Reinhart, 2017).

Figure 2

Wilkins' KABP Model



Note: From "The Relationship among Elementary Teachers" Content Knowledge, Attitudes, Beliefs, and Practices, " by J. Wilkins, 2008, *Journal of Mathematics Teacher Education* 11, 139-164. (<https://doi.org/10.1007/s10857-007-9068-2>. Copyright 2008 by Springer.

Interestingly, in Wilkins's (2008) study, content knowledge had a negative, significant correlation with instructional practices ($B = -0.30, p < 0.05$); that is, respondents with higher levels of content knowledge were less likely to use the instructional practice of interest. However, the effect of beliefs mediated the correlation between content knowledge and instructional practices. This effect is shown by calculating the product of the individual effects (pathway coefficient for content knowledge to beliefs [$r = -.22$] x pathway coefficient from beliefs to instructional practices [$r = .32$]). This outcome suggests that a teacher with high content knowledge and stronger beliefs about the instructional practice of interest is likelier to adopt the practice than one with high content knowledge but weaker beliefs (Wilkins, 2008).

Though Ernest's (1989) and Wilkins's (2008) research focused on elementary school math educators, Ernest (1989) noted that the conceptual model is transferable to other teaching disciplines and levels of education. Two studies in higher education (Hutchins, 2009; Hutchins & Friedrichsen, 2012) and one study of nurse educators (Raker, 2022) were found that used the KABP model as a framework for studies examining relationships among educators' content knowledge, attitudes, beliefs, and instructional practices; thus, providing support for its use as an appropriate model for this research.

Several relevant conclusions from Wilkins's (2008) work informed the research questions for this study. First, higher content knowledge does not always translate into desirable instructional practices, but rather only as it affects attitudes and, ultimately, beliefs (Wilkins, 2008). Secondly, when comparing the effects of content knowledge, attitudes, and beliefs on instructional practices, the impact of beliefs is the strongest, in that the influence of content knowledge and attitude is partly due to the direct effect of these variables on beliefs. The positive relationship between beliefs and instructional practices was consistent among educators (Wilkins, 2008). These conclusions from the Wilkins (2008) study supported the need to include *beliefs* as a separate variable in this study and to explore the impact of content knowledge on attitudes and beliefs. Lastly, Wilkins (2008) did note that not all instructors with strong beliefs in the instructional practice(s) of interest actually used the practices, suggesting that other yet unknown factors affect instructional practices. These barriers may be related to external control beliefs (i.e., perceived lack of resources or time) or internal control beliefs (confidence,

comfort, perceived knowledge) regarding the practice, thus providing support for describing those variables in this study (Ajzen, 1991; Ajzen, 2002).

In addition to providing support for the research questions, the KABP model was used as a foundation for the development of the theoretical definitions of several key variables that are not explained in the theory of planned behavior, namely, instructional practices and content knowledge. A discussion of the derivation of these definitions is provided in the following sections.

Instructional Practices in the KABP Model

Instructional practices, as described by Ernest (1989), encompass a broad range of activities that include both the selection of content and methods used to teach the content. Ernest (1989) posited that an educator's content knowledge, attitudes, and beliefs directly and indirectly impact every decision that is made when planning instruction. These decisions include content to include (and not include), as well as specific methods or pedagogies for teaching the content (i.e., active vs. passive teaching and learning methods) (Ernest, 1989; Wilkins, 2008). The instructional practices (content and methods) have a direct impact on student learning (Ernest, 1989). The theoretical definition of instructional practices for this study was based on the descriptions of this concept from Ernest (1989) and Wilkins (2008).

Theoretical Definition of Instructional Practices

Instructional practices, for this study, were defined as *the curriculum, content, and instructional methods that nursing faculty use to teach nutrition for health promotion, which ultimately affects student learning* (Ernest, 1989; Oxford University

Press, 2023; Wilkins, 2008). The instructional practice of interest in Wilkin's (2008) study was mathematics teachers' use of inquiry-based instructional methods. Because of the exploratory nature of the current study, the instructional practices of interest were more broadly defined to include curriculum, content, and methods used to teach nutrition for health promotion. Theoretical and operational definitions for all study variables are found in Appendix A.

Content Knowledge in the KABP Model

Ernest (1989) and Wilkins (2008) describe content knowledge as having a solid command and practical understanding of the subject matter that is being taught. The level of the educators' content knowledge is the foundation for the lesson; that is, what is known about the subject matter will directly affect the particulars of instruction, such as the explanations, learning activities, answers to questions, etc. (Ernest, 1989). An educator must have a substantial knowledge base in the subject being taught in order to plan for the instruction and to guide the learners' responses to the teaching (Ernest, 1989). The theoretical definition of content knowledge for this study was based on Ernest's (1989) and Wilkins's (2008) definitions.

Theoretical Definition of Content Knowledge

Content knowledge was defined as *a practical understanding of dietary patterns that are known to prevent disease and sustain or improve health*. This definition is derived from two elements. The first is the definition of content knowledge in the KABP model, which is *a strong command and practical understanding of the subject matter that is being taught* (Wilkins, 2008), and the second is universally accepted recommendations

for a healthy diet (Harkin, 2018; Romagnolo & Selmin, 2016; USDA, 2020; WHO, 2022). Theoretical and operational definitions for all study variables are found in Appendix A.

Integrated Model

The theory of planned behavior and Wilkins' KABP model complement each other and provide comprehensive theoretical support for the definitions of the variables, research questions, study design, and survey questions (Ajzen, 1991; Wilkins, 2008). The theory of planned behavior provides a foundation for the assumptions about behavioral intention and the theoretical definitions for the variables of attitude and beliefs. As such, it informed the research questions as well as the development of survey items that measured attitude and belief.

The theory of planned behavior is not explicitly oriented to education and does not consider the impact of knowledge on behavior (Ajzen, 1991; Boston University, 2022). Therefore, Wilkins's (2008) KABP model was used to bridge these gaps for this study. The KABP model provides the needed support for defining content knowledge and instructional practices. Additionally, the KABP model offers a theoretical framework for potential interrelationships among content knowledge, attitudes, beliefs, and instructional practices, thus justifying the need to describe these variables in this study. In combination, the theory of planned behavior and Wilkins's (2008) KABP model provide a complete foundation and the needed theoretical support.

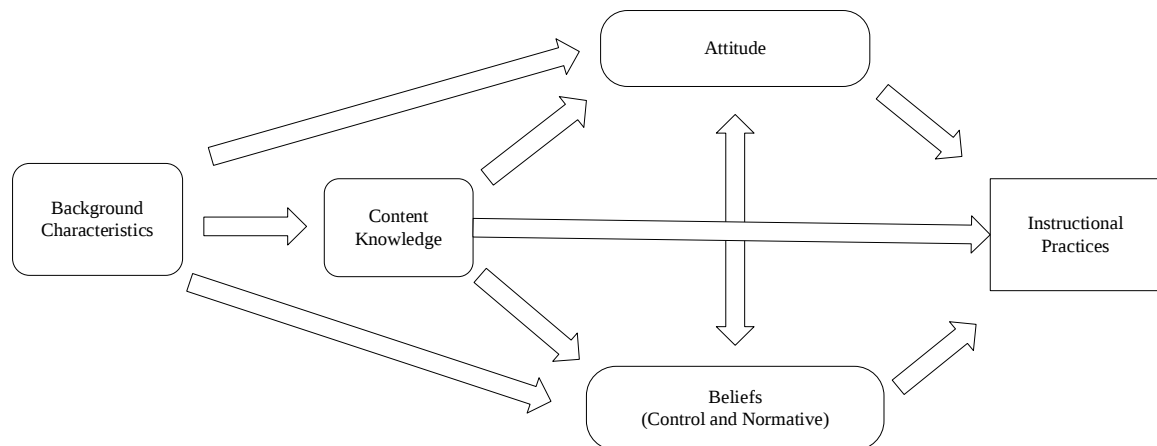
Key assumptions that underlie the premise of the integrated model are as follows:

- a) in order to be effective, educators must have a sound knowledge base of the content

that they are teaching (Ernest, 1989; Wilkins, 2008), b) educators with positive attitudes about the benefits of a particular instructional practice are more likely to undertake said practice (Ajzen, 1991; Wilkins, 2008), c) educators' normative and control beliefs significantly influence their intention to adopt new instructional practices (Ajzen, 1991; Wilkins, 2008), and d) an educator's background characteristics, such as educational background and length of time teaching, impact their knowledge, attitudes, and beliefs about instructional practices (Wilkins, 2008). A graphic depiction of the integrated model for the study is seen in Figure 3.

Figure 3

Integrated Model for the Study



Chapter Summary

Chapter two presents a review of the literature relevant to this study and discusses the theoretical framework. The literature review focused on the current status of nutrition in nursing education, the status of nurses' nutrition knowledge, and the attitudes and beliefs of nurses regarding the provision of nutrition-related nursing care. Gaps in the

research were highlighted, especially the lack of research on nursing faculty members' knowledge, attitudes, or beliefs regarding teaching nutrition (generally) or nutrition for health promotion (specifically). The theoretical framework integrates both the theory of planned behavior (Ajzen, 1991) and Wilkins's (2008) KABP model. In Chapter Three, the development and validation of the measure that was used in the study is described.

CHAPTER THREE

INSTRUMENT DEVELOPMENT

The instrument for the study was an online self-report questionnaire that assessed the Knowledge, Attitudes, Beliefs, and Instructional Practices related to Teaching Nutrition for Health Promotion (KABP-TNHP). The KABP-TNHP consists of a total of 97 items in five major sections, which are as follows:

- Knowledge (49 items, previously validated instrument)
- Attitudes (10 items, authored by the researcher)
- Beliefs (10 items, authored by the researcher)
- Instructional practices (17 items, authored by the researcher)
- Demographic and background information (12 items)

In this chapter, the development of each section and the pre-study validation procedures are described. The KABP-TNHP can be found in Appendix B.

Knowledge Scale

The definition of content knowledge for the study is *a practical understanding of dietary patterns that are known to prevent disease and sustain or improve health* (Harkin, 2018; Oxford University Press, 2023; Romagnolo & Selmin, 2016; WHO, 2022). The General Nutrition Knowledge Questionnaire-Revised (GNKQ-R) was used in its entirety to measure nutrition knowledge in the current study. The GNKQ-R, initially developed by Parmenter and Wardle (1999) and later updated by Kliemann et al. (2016), has been widely used in nutrition research. Kliemann et al. (2016) assessed the measure for

reliability, internal consistency of items, construct validity, and convergent validity and found psychometric evidence of reliability and validity.

Though developed using international nutrition guidelines, the GNKQ-R was written and tested in the United Kingdom, therefore requiring some modifications for use in a U.S.-based sample. Zickgraf and Barrada (2022) modified it by changing terms specific to the United Kingdom to terms familiar to a U.S. audience. For example, one item, "biscuits, cakes, and pastries," was changed to "cookies, cakes, and pastries." The GNKQ-R is an open-access resource, and Zickgraf and Barrada (2022) supplied permission to use their slightly modified version. The GNKQ-R can be found in Appendix C.

The GNKQ-R is divided into four subscales, namely, dietary recommendations, sources of nutrients, healthy food choices, and diet-disease relationships, for a total of 49 knowledge questions and 88 items. The GNKQ-R is scored as a total percentage of correct answers overall. Furthermore, the total percentage of correct answers within each subscale can be scored to break down the knowledge level in specific content areas.

Attitudes and Beliefs Scales

No previously validated instrument was found that measured attitudes or beliefs about teaching nutrition or teaching nutrition for health promotion, necessitating the development of novel items. This section will describe the development of these items.

In writing novel items, careful consideration was given to optimizing validity and reliability. Dillman et al. (2014) state that the first step to writing a valid and reliable survey is to start with straightforward research questions and definitions for the measured

constructs. When clear construct definitions guide item development, there is increased assurance that the items will be valid measures (Dillman et al. (2014). The researcher used the theoretical definitions of attitudes and beliefs described earlier in this paper and based on the theory of planned behavior (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002) as the basis for the novel items.

Step One: Foundation of Novel Items

The literature was reviewed to search for validated instruments that measured nursing faculty attitudes and beliefs. Two instruments proved to be suitable archetypes for the development of these items. LePage et al. (2015) used the theory of planned behavior as a framework to design a study of attitudes and beliefs of nursing faculty members regarding teaching smoking cessation in undergraduate nursing programs. Though the content area is different (smoking cessation versus nutrition for health promotion), the similarity of the research questions and the use of the theory of planned behavior as a framework make their instrument a suitable example to guide item development for this study. Additionally, LePage et al. (2015) reported psychometric evidence of instrument validity and reliability.

A second study by Raker (2022) used Wilkins' (2008) theoretical model (previously described, see Chapter 2) to conduct a study that surveyed nursing faculty about their knowledge, attitudes, and beliefs regarding teaching about human trafficking. Again, though a different content area, the similarity of research aims and the use of Wilkin's (2008) model make their instrument another suitable archetype for initial item development. After receiving permission from both LePage and Raker to use their

instruments as archetypes for developing a novel instrument, the initial draft of the attitudes and beliefs items was written.

Step Two: Drafting Items

The researcher initially drafted the items by modifying the items in the LePage et al. (2015) and Raker (2022) questionnaires. For example, *smoking cessation* (LePage et al., 2015) and *human trafficking* (Raker, 2022) were changed to *nutrition for health promotion*. Then, the format and wording of the items were modified to incorporate best practices in survey item writing (Dillman et al., 2014). For example, items were revised to reduce excessive wordiness and simplify sentence structure (Dillman et al., 2014). The Likert scale items were revised to be bipolar, with a neutral midpoint, which may decrease non-response and inaccurate responses from respondents who truly feel neutral (Dillman et al., 2014). The Likert scale length was set at five points, which is known to be long enough to capture the continuum of answers but not too long to increase respondents' cognitive burden (Dillman et al., 2014). Finally, items were reworded so that the item stem was direct and construct-specific to reduce the cognitive burden of indirect questions with more than one construct to consider (i.e., the construct of interest and their level of agreement) (Dillman et al., 2014). For example, the item asking respondents to rate their agreement with *In my opinion, it is important to incorporate nutrition for health promotion concepts into pre-licensure nursing courses* was revised to read *Is it important to incorporate nutrition for health promotion concepts into pre-licensure nursing courses?*

Step Three: Evaluating Items

A purposive sample of experts was recruited to evaluate the items for sufficiency, clarity, coherence, and relevance to the measured constructs (Fishbein & Ajzen, 2010). The inclusion criteria for the experts were a) doctorally prepared nursing faculty member and b) five or more years of teaching experience in undergraduate nursing programs. Five participants were recruited for the pre-study evaluation, and four completed the evaluation via an online self-report questionnaire.

The study definitions were presented to the expert participants. Participants were shown each proposed item and were asked the following questions (closed-ended, Likert scale) about each (Fishbein & Ajzen, 2010).

1. Do you easily understand what this item is asking? (clarity)
2. Does this item relate to the definition of attitude (belief) being used for this study? (relevance, coherence)
3. Considering the definition, is this item important to measure? (relevance, coherence).

Additionally, to assess sufficiency, the expert participants were asked if the attitude and belief items in totality were sufficient to measure the corresponding construct.

The a priori goal for including an item was 100% expert agreement (i.e., definitely yes or probably yes) for each question. The pre-study evaluation questionnaire can be found in Appendix D.

Step Four: Analyzing Results of Expert Review

The frequencies of responses to each item/question pair were reviewed. There was 100% agreement among the expert respondents for the items measuring clarity and sufficiency. In questions assessing coherence and relevance, four-item/question pairs did not have 100% agreement from all expert participants. Each of the four items lacking 100% agreement, as shown in Table 1, was carefully reviewed. All four items were retained in the survey because a) the majority of experts agreed that they were valid, b) the researcher, in consultation with an experienced nurse researcher, agreed that they reflected the study's definition of attitude or belief, and c) similar items in LePage et al.'s (2015) and Raker's (2022) instruments were deemed important and valid for their measure of attitude or belief.

Table 1

Item/Question Pairs Lacking 100% Agreement

Item	Question	Results
Attitude: Does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship?	Considering the definition, is this item important to measure?	Probably yes: 3 Neither yes or no: 1
Attitude: Do nursing faculty have a professional obligation to teach nutrition for health promotion?	Considering the definition, is this item important to measure?	Probably or definitely yes: 3 Neither yes or no: 1
Belief: Would you enjoy teaching nutrition for health promotion?	Considering the definition, is this item important to measure?	Probably or definitely yes: 3 Neither yes or no: 1
Belief: Do students enrolled in your pre-licensure nursing program think nutrition for health promotion should be incorporated into pre-licensure nursing curricula?	Considering the definition, is this item important to measure?	Probably or definitely yes: 3 Neither yes or no: 1

Based on the review of these four items, one (*Would you enjoy teaching nutrition for health promotion?*) was moved from the beliefs scale to the attitudes scale. Comments

from experts regarding this item included "not as much as other questions" and "this is an attitude." Based on the respondents' feedback and review of the construct definitions, the researcher determined that this question was necessary but was better suited to measure attitude than belief. Furthermore, perceived enjoyment is aligned with the definition of attitude in the theory of planned behavior (Ajzen 1991, Ajzen, 2001; French et al., 2005) and also in Wilson's (2008) theoretical model.

In summary, because the items in the KABP-TNHP that measure attitudes and beliefs are novel, care was taken to ensure that the items would be valid and reliable measures. The items were written based on the definitions of attitude and belief from the theory of planned behavior. Dillman et al.'s (2014) guidelines for writing high-performing survey items were followed. The items were then evaluated by a panel of experts for sufficiency, clarity, coherence, and relevance to the measured constructs (Fishbein & Ajzen, 2010), and changes were made based on the evaluation.

Instructional Practices Scale

Items were developed by the researcher, an experienced nurse educator, to assess current instructional practices of nursing faculty regarding the teaching of nutrition for health promotion. Collectively, the items assessed two categories of faculty instructional practices: (a) curriculum and (b) personal experience. The formatting and wording of the items that measure instructional practices were modeled after items in the Raker (2022) study but modified to be less wordy and reduce cognitive burden when applicable (Dillman et al., 2014). All items were closed-ended, but the *select all that apply* items have an option for *other, please specify* which allows respondents to share additional

qualitative information if they so choose. Additionally, the option to select *I don't know* was included for all items to reduce the chance of non-response error.

Content areas to include in the instructional practices measure were determined by the researcher, who has experiential and academic expertise in nursing education, nutrition, and health promotion. The researcher identified the relevant content areas based on the *Dietary Guidelines for Americans 2020-2025* (U.S. Department of Agriculture, 2020), the recommendations of the World Health Organization (WHO, 2024) for a healthy diet, and behavior-change theories and techniques shown to be superior in promoting positive health behavior change (Rigby et al., 2020). Table 2 depicts the content areas included in the instructional practices scale of the KABP-TNHP.

Table 2

Content Areas Included in Instructional Practices Scale

Nutrition for Health Promotion Content Areas	Behavior Change Theories	Behavior Change Techniques
• Eating to maintain a healthy weight. • Health benefits of eating a wide variety of vegetables and fruits. • Health benefits of eating a plant-forward diet. • Health benefits of eating a high-fiber diet. • Health benefits of eating a diet rich in healthy fats. •	• Health Belief Model • Motivational Interviewing • Transtheoretical Model (Stages of Change) • Theory of Planned Behavior • Social Cognitive Theory	• Goal-setting • Problem-solving • Social support • Self-monitoring of behavior • Information about health consequences • Feedback on behavior • Non-specific reward • Restructuring the physical environment • Framing/Reframing

Table 2-Continued

Content Areas Included in Instructional Practices Scale

Nutrition for Health Promotion Content Areas	Behavior Change Theories	Behavior Change Techniques
• Health benefits of avoiding highly processed foods. • Health benefits of avoiding added sugar • Health benefits of eating whole (unprocessed) grains • Health benefits of eating fish • Health benefits of eating legumes (i.e., beans, lentils) • Health benefits of eating brightly-colored vegetables and fruits • Connection between diet and health. • Connection between diet and disease		

(Rigby et al., 2020; U.S. Department of Agriculture, 2020; World Health Organization, 2024).

Curriculum

Eleven items explore the structure of nutrition education and the content areas of nutrition for health promotion in curricula. These items were presented in either a

dichotomous *yes/no* or *select all that apply* format, including an *I don't know* option to prevent missing data.

Faculty Experience

Six items ask about the respondent's experience in teaching nutrition for health promotion. These items ask the respondent to answer *yes*, *no*, or *I don't know* regarding personal experiences teaching nutrition for health promotion. If respondents chose *yes* or *I don't know*, then items in a *select all that apply* format were presented to collect information about personal experience teaching specific nutrition for health promotion content areas (refer again to Table 2) and instructional methods for teaching nutrition for health promotion.

Instructional Methods

One *select all that apply* item asks the respondent about instructional methods personally used to teach nutrition for health promotion. The instructional methods included in the item are listed below (Billings & Halstead, 2020). The options of *other*, *please specify*, and *I don't know*, were also provided.

- Case study
- Flipped classroom
- Gaming
- Guided clinical experience
- Independent reading
- Journal Clubs
- Online module
- Peer learning
- Pre- or post-clinical conference
- PowerPoint lecture
- Simulation
- Group discussion
- Student presentation

Demographic and Background Information

The section querying demographic data includes job title, academic rank, gender, age, ethnicity, and primary area of teaching expertise. Additionally, items were developed to determine background information of interest, including information about the educational institution where the faculty member is employed (geographic region and whether it is a private vs. public institution). Additionally, faculty background characteristics were collected, including years of teaching experience, highest degree earned, and whether or not the respondent has completed continuing education in nutrition topics. Demographic and background items were placed at the end of the KABP-TNHP to reduce the influence of respondent fatigue on answer choices (Dillman et al., 2014; Iarossi, 2006).

Final Survey Construction

Upon final review for grammar and spelling errors, the KABP-TNHP was finalized and constructed in the Qualtrics® survey platform for distribution. The researcher used Dillman et al.'s (2014) guidelines for constructing an internet-based survey. These guidelines collectively enhance validity by reducing non-response and measurement errors. Strategies included using a platform optimized for mobile devices, allowing respondents to go back to previous questions, allowing respondents to pause and finish later, reminding respondents if they have left an answer blank (but not requiring an answer), and using skip logic so respondents do not see items that do not apply to them (reducing cognitive burden and respondent frustration).

The KABP-TNHP can be used to assess nursing faculty knowledge, attitudes, beliefs, and instructional practices related to teaching nutrition for health promotion. The knowledge subscale comprises the GNKQ-R, a previously validated instrument (Kliemann et al., 2016; Zickgraf & Barrada, 2022). The attitudes and beliefs items were derived based on the theoretical definitions of the constructs (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002) and by using archetype instruments (LePage et al., 2015; Raker, 2022). Additionally, the researcher used a panel of experts to assess the clarity, coherence, relevance, and sufficiency of the items before finalizing the instrument. The items concerning instructional practices were authored by the researcher based on expert dietary and behavior-change recommendations (Rigby et al., 2020; U.S. Department of Agriculture, 2020; World Health Organization, 2024). Collectively, the procedures used to develop the KABP-TNHP enhance the probability of a valid and reliable instrument for the study.

Chapter Summary

In this chapter, the procedures for developing the KABP-TNHP were described. The process for developing each section was discussed with emphasis on the measures taken to ensure the validity of the instrument. The researcher concludes that the KABP-TNHP is a valid instrument for the measurement of nursing faculty members' knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. In the next chapter, the methods used for conducting the study and analyzing the data are described.

CHAPTER FOUR

METHODOLOGY

In this chapter, the methods for conducting the study and analyzing the data are presented. The chapter begins with a discussion of the study design, followed by a description of the sampling strategy. The general procedures for conducting the study and a discussion of how the data was analyzed conclude the chapter.

Research Design

This descriptive, cross-sectional study aimed to describe the knowledge, attitudes, beliefs, and instructional practices of nursing faculty teaching in prelicensure baccalaureate nursing programs regarding teaching nutrition for health promotion. Descriptive, cross-sectional designs are appropriate for exploratory research (inductive knowledge generation) when little is known about a topic (Portney, 2020; Waltz et al., 2017). Additionally, this design choice allowed for exploring relationships among variables (Portney, 2020; Waltz et al., 2017), a secondary aim of the study. This study does not seek to prove causation but instead provides a foundation for future research.

Setting, Sampling, and Recruitment

Rigorous sampling procedures were used to collect a representative sample of nursing faculty teaching in accredited prelicensure baccalaureate nursing programs in the United States. Participants were sampled from prelicensure baccalaureate nursing programs accredited by the Commission on Collegiate Nursing Education (CCNE) or the Accreditation Commission for Education in Nursing (ACEN). These two organizations accredit most baccalaureate nursing programs in the United States and provide publicly

available contact information for each program. Inclusion criteria for the proposed study were purposefully selected to increase the likelihood of a representative sample and reduce sampling error. The inclusion criteria were:

1. Current licensure as a registered nurse (RN).
2. Employment as a full-time faculty member in an accredited pre-licensure baccalaureate program.
3. Minimum of one year of classroom teaching experience in a prelicensure nursing program.

Full-time employment was required because full-time faculty are typically responsible for curriculum development and do the majority of classroom instruction. Additionally, a minimum of one year of full-time classroom teaching experience was required to mitigate the effect of confounding variables that may be present due to inexperience.

Sample Size

The a priori sample size was calculated using a power analysis based on the proportion of a finite population correction. The R programming language with the package sampling book (Manitz et al., 2021) was used for computation. Based on a precision of .05, a nominal alpha set to .05, and a response distribution of 0.5, a sample size of 330 was proposed.

Recruitment Procedures

Convenience sampling was used to sample nursing faculty teaching in undergraduate, accredited nursing programs in the United States. Publicly available lists of baccalaureate nursing programs from ACEN and CCNE were used to identify

accredited prelicensure baccalaureate nursing programs. Email addresses for the nursing program administrators of each program are available on the ACEN and CCNE websites. Permission to use the email addresses for recruitment purposes was obtained from each of these organizations. An initial email (Appendix E) was sent to the nursing program administrators of all accredited prelicensure baccalaureate programs. This email contained an attached recruitment letter (Appendix F), a link to access the questionnaire, and a request to forward to nursing faculty teaching in their program.

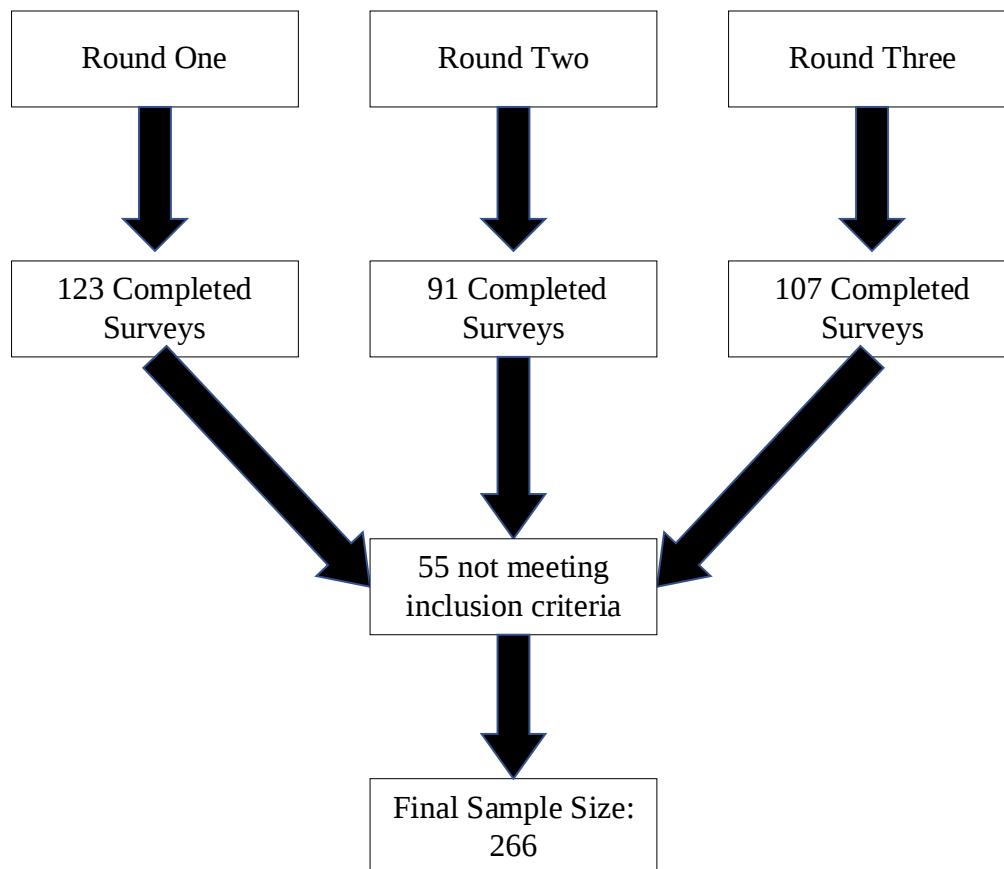
Response rate is a concern in online surveys, and a poor response rate can threaten the validity of results by creating sampling errors (Dillman et al., 2014; Portney, 2020). To maximize the response rate, Dillman et al.'s (2014) *Tailored Design Method* for survey methodology was used to guide recruitment strategies. Dillman et al.'s (2014) strategies include distinct points of contact, making communication personalized as much as possible, aligning the survey with a legitimate organization, and informing respondents that their participation is valued (Dillman et al., 2014). These principles were considered when drafting all written communication to potential respondents. Dillman et al. (2014) also recommend incentives to increase participation in online surveys. The recruitment letter included an opportunity for participants who complete the survey to be entered into a drawing to win one of four Amazon gift cards, each valued at \$50 (funded by the researcher).

Nursing program administrators (n = 885) were contacted on three separate occasions approximately three to four weeks apart. The mail merge function in Google Sheets and Gmail was used to send the initial (and subsequent) emails, which allowed for a personal

salutation for each administrator. The recruitment rounds and results are displayed in Figure 4.

Figure 4

Recruitment



Survey Delivery Procedures

As previously described, a link to the KABP-TNHP on Qualtrics was included in the email(s) sent to the nursing program administrators and in the attached recruitment letter. Upon accessing the link, a respondent was presented with the Information Sheet (previously discussed) and the option to select *I agree to participate in this research study*. Upon selecting this option, the survey items populated. The first three items

presented to the respondents screened the participants for inclusion criteria. The survey ended with a thank you message if the respondent selected *no* for any of the first three items. If the respondent selected *yes* to the first three items, the remainder of the survey was presented to the participant.

Incentives

A modest monetary incentive was used to motivate respondents to complete the survey (Dillman et al., 2014). After completing the last item on the survey, respondents were given an option (not required) to access a link to a separate Qualtrics survey where they could enter their email address for entry into a raffle to win one of four Amazon gift cards, valued at fifty dollars each. This procedure ensured that no identifiable information was linked to survey responses. One hundred and seventy-eight participants accessed the link and entered their email address. Four email addresses were randomly selected using a random number generator. A fifty-dollar gift card was sent from the researcher's Oakland University email address to each of the randomly selected email addresses. Upon sending the gift cards, the sent emails were deleted from both the 'sent' and the 'trash' folders and the researcher's Amazon account. The researcher retained no email addresses.

Ethical Considerations

Before recruitment and data collection, the researcher obtained approval for the study from the Oakland University Institutional Review Board (IRB); the study was classified as exempt research by the Oakland University IRB. The IRB approved two modifications after the initial approval, the first for revision to survey items resulting

from the pre-study instrument evaluation and the second for revision of the third recruitment email. The Oakland University IRB approval letters can be viewed in Appendix G. Upon accessing the survey link, a welcome message, including the study purpose and information sheet (Appendix H), appeared, including a statement that there are no known risks associated with this study, that participation is voluntary, and that responses are anonymous. Respondents were prompted to select *I agree to participate in this research study* after the information sheet was presented to ensure informed consent. Upon selection of this option, the survey items populated for completion.

Data from the Qualtrics platform were downloaded and stored in a password-protected server, available only to the researcher. The data that was uploaded into IBM Statistical Package for Social Sciences (SPSS, Version 29) is password-protected and only accessible to the researcher. Data was displayed on-screen during collaboration meetings with the statistician and committee chair, but access to the data remains with the researcher only. Data will be retained for 11 years. Any future dissemination of study findings will report data in aggregate with no personally identifiable information linked to responses.

Data Analysis

Survey data from the KABP-TNHP was downloaded from Qualtrics into Excel spreadsheets and then uploaded into IBM SPSS Statistics (Version 29) software. After checking the data for accuracy and completeness, frequency distributions and descriptive statistics functions in SPSS were used to check for normalcy and outliers.

The explore function in SPSS was used to assess for outliers and univariate normality of the main study variables (knowledge, attitudes, beliefs, and instructional practices). Histograms, boxplots, stem and leaf graphs, coefficients of kurtosis and skewness, and Q-Q plots were examined. Additionally, Kolmogorov-Smirnov and Shapiro-Wilk statistics were analyzed.

Research Question One: Knowledge

Research question one was: *What is prelicensure baccalaureate nursing faculty members' level of content knowledge regarding nutrition for health promotion?* The percentage of correct answers from the KABP-TNHP knowledge scale was calculated to describe the overall level of content knowledge. Each item is worth one point for a total possible score of 88 points (Kliemann et al., 2016). A median, mean, range, and standard deviation were calculated to describe nursing faculty members' overall knowledge of nutrition for health promotion (Kliemann et al., 2016). Additionally, each subscale was scored individually to assess faculty members' knowledge of different aspects of nutrition. A median, mean, range, and standard deviation were calculated for each of the four subscales of the GNKQ-R. These statistics were used to assess faculty members' level of knowledge among the sub-topics of *dietary recommendations* (maximum score 18 points), *sources of nutrients* (maximum score 36 points), *healthy food choices* (maximum score 13 points), and *diet-disease relationship* (maximum score 21 points) (Kliemann et al., 2016).

Research Question Two: Attitudes and Beliefs

Research question two was: *What are prelicensure baccalaureate nursing faculty members' attitudes and beliefs regarding teaching nutrition as a strategy for health promotion?* Each point on the five-point Likert scale used to measure attitudes and beliefs was scored as follows: (a) definitely yes = 2, (b) probably yes = 1, (c) neither yes or no (neutral) = 0, (d) probably not = -1 and (e) definitely not = -2. This scoring structure aligns with the scoring used by LePage et al. (2015), who scored the items in their 3-point Likert scale as "disagree" = -1, "I don't know" = 0, and "agree" = +1. Negatively worded items were reverse-coded prior to analysis (Portney, 2020).

Attitudes

Eight positively and two negatively worded items assessed attitudes on a five-point Likert scale. Each item's median, mean, and standard deviation were calculated. Additionally, a total score for each respondent was summed with a possible range of 20 to -20, with higher scores indicating a more positive attitude overall towards teaching nutrition for health promotion. The distribution of total scores, median score, mean score, standard deviation, and confidence interval was calculated to describe the attitudes of nursing faculty toward teaching nutrition for health promotion.

Beliefs

Beliefs were assessed with ten positively-worded items on a five-point Likert scale, divided into two subscales: *control beliefs* and *normative beliefs*. Each item's median, mean, and standard deviation were calculated. Additionally, a total score for each respondent was summed with a possible range of 20 to -20, with higher scores

indicating beliefs amenable to teaching nutrition for health promotion. The distribution of total scores, median score, mean score, standard deviation, and confidence interval was calculated to describe the beliefs of nursing faculty toward teaching nutrition for health promotion.

Control Beliefs. Five positively worded items assessed control beliefs. A total score for each respondent ranging from 10 to -10, was summed from the five items. Higher, positive scores will indicate that faculty members believe they have the ability, resources, and opportunities to teach nutrition for health promotion. The distribution of total scores, median, mean, standard deviation, and confidence interval were calculated to provide an overall measure of control beliefs (Lepage et al., 2015).

Normative Beliefs. Five positively worded items assessed normative beliefs, and each item's frequency, median, mean, and standard deviation were calculated (Lepage et al., 2015). Additionally, a total score from each respondent (Lepage et al., 2015), ranging from 10 to -10, was summed from the five items. A higher positive score indicates a stronger belief that teaching nutrition for health promotion is expected from the faculty members' work-related social groups. Total scores, median, mean, standard deviation, and confidence interval were calculated to provide an overall measure of normative beliefs (Lepage et al., 2015).

Research Question Three: Instructional Practices

Research question three was: *What are prelicensure baccalaureate nursing faculty members' current instructional practices regarding teaching nutrition for health promotion?* Items comprising this section are formatted as either *select all that apply* or

yes/no/some/I don't know. The data generated for this variable were categorical.

Frequencies for each item were calculated to describe respondents' current instructional practices regarding teaching nutrition for health promotion, including curriculum and personal experience (Raker, 2022).

Research Question Four: Relationships

Research question four was: *Are there correlations among prelicensure baccalaureate faculty members' level of content knowledge, attitudes, beliefs, or instructional practices?* Bivariate correlations and logistic regression were used to answer this research question.

Correlations: Knowledge, Attitudes, Beliefs

The data distribution using scatter plots and histograms for knowledge, attitude, beliefs, and control belief variables was examined (Kim & Mallory, 2017; Mertler & Reinhart, 2017). Bivariate correlations (Pearson r) with bootstrapping were run in SPSS for the following pairs of variables: (a) knowledge and attitudes, (b) knowledge and overall beliefs, (c) knowledge and control beliefs, (d) attitudes and overall beliefs, and (e) attitudes and control beliefs. Confidence intervals were also calculated for the correlations (Mertler & Reinhart, 2017; Wilkins, 2008).

Relationships: Knowledge, Attitudes, Beliefs and Instructional Practices

Forward logistic regression was conducted to assess if the variables of knowledge, attitude, and/or beliefs predicted instructional practices. Logistic regression is appropriate when the dependent variable is categorical and relationships between the independent and dependent variables are nonlinear (Mertler & Reinhart, 2017). Data were sorted by the

question *do you have personal experience teaching students about nutrition for health promotion*, to which respondents were prompted to answer *yes*, *no*, or *unsure*. Data from the four respondents who answered ‘unsure’ were not included in the calculation.

Chapter Summary

In this chapter, the methodology for the research study was presented. The design, sampling strategy, and recruitment procedures were discussed. Survey delivery and ethical considerations were presented, and the chapter concluded with a description of the data collection and analysis procedures. Chapter Five will describe the results of data analysis.

CHAPTER FIVE

RESULTS

In Chapter Five, the results of the statistical analysis performed on the collected data are described. The chapter begins with a description of the study sample, and then the results of data analysis are presented in the context of each research question.

Sample Description

As discussed in the previous chapter, the survey was sent to 885 nursing program administrators, who were asked to forward the survey to faculty. A total of 321 surveys were completed by the end of the data collection period. Participants who did not meet inclusion criteria ($n = 55$) were not included in the analysis. A valid response rate is difficult to calculate because program administrators were asked to forward the survey to faculty, and it is impossible to know how many faculty members received the opportunity. The final sample size for the study was 266 participants.

Demographic Data

Demographic data were collected to describe the sample characteristics, including gender, age, and ethnicity. Participants identified as primarily female ($n = 243$, 91.7%), White ($n = 244$, 91.7%), and non-Hispanic/Latino ($n = 248$, 93.6%). A majority of participants reported their age as greater than 50 years ($n = 141$, 53.2%). Table 3 displays the gender, age, and ethnicity data for all participants.

Table 3*Participants' Gender, Age, and Ethnicity Background*

Demographic	n	%
Gender (<i>n</i> = 265)		
Female	243	91.7%
Male	16	6.03%
Non-Binary/Third Gender	2	0.75%
Prefer not to say	4	1.5%
Hispanic/Latino (<i>n</i> = 265)		
Yes	11	4.2%
No	248	93.6%
Prefer not to say	6	2.3%
Race (<i>n</i> = 266-could choose more than one)		
White	244	91.7%
Black or African American	9	3.38%
American Indian or Alaska Native	4	1.5%
Asian	4	1.5%
Native Hawaiian or Pacific Islander	2	0.75%
Other	1	0.38%
Prefer not to say	10	3.8%
Age (<i>n</i> = 265)		
Less than 30 years	6	2.3%
Between 30 and 40 years	56	21.1%
Between 40 and 50 years	61	23.0%
Greater than 50 years	141	53.2%
Prefer not to say	1	0.38%

Information about the type and location of the educational institution was also collected. Participants from the Midwest United States (*n* = 91, 34.2%) had a slight majority over participants from the Southern United States (*n* = 88, 33.1%), followed by the Eastern United States (*n* = 58, 21.8%) and the Western United States (*n* = 29, 10.9%). Participants reported teaching in public institutions (*n* = 128, 48.1%), private, religious institutions (*n* = 98, 36.8%), private, secular institutions (*n* = 39, 14.7%), and other (*n* = 2, 0.76%). Table 4 displays the data regarding the type and location of educational institutions.

Table 4*Location and Type of Academic Institution*

	n	%
Geographic Location (<i>n</i> = 266)		
Eastern United States	58	21.8%
Midwest United States	91	34.2%
Southern United States	88	33.1%
Western United States	29	10.9%
Type of Academic Institution (<i>n</i> = 266)		
Public	128	48.1%
Private, religious	98	36.8%
Private, secular	38	14.3%
Other	2*	0.75%
	*College; State College	

The KABP-TNHP also collected academic-related information about each participant, including job title, academic rank, years of teaching experience, highest degree earned, and continuing education in nutrition. Most participants reported their job title as *Nursing Faculty Member* (*n* = 238, 89.5%). Over half of the participants' rank was reported as *Assistant Professor* (*n* = 147, 55.3%), with the remaining options (instructor, associate professor, professor) distributed relatively evenly (13.2%, 18.8%, and 12%, respectively). Most participants had between one and five years (*n* = 102, 38.3%) or between six and ten years (*n* = 66, 24.8%) of teaching experience. Most participants reported that their highest degree earned was a doctoral (PhD or DNP) (*n* = 143, 53.8%) or master's (*n* = 115, 43.2%) degree. A large majority reported never completing continuing education on nutrition (*n* = 188, 70.7%). Table 5 displays the participants' academic background.

Table 5*Participants Academic Background*

Background Characteristic	n	%
Job Title (<i>n</i> = 266-Could choose > 1)		
Nursing Faculty Member	238	89.5%
Department Chair	14	5.3%
Program Director	15	5.6%
Program Coordinator	13	4.9%
Associate Dean	2	0.75%
Dean	2	0.75%
Other	5*	1.9%
	*Director of Academic Innovation; Skills and Simulation Coordinator; Director of Curriculum; but answered from years of experience as faculty	
Rank (<i>n</i> = 266)		
Instructor	35	13.2%
Assistant Professor	147	55.3%
Associate Professor	50	18.8%
Professor	32	12.0%
Other	2 (not specified)	0.38%
Years of Teaching Experience (in a baccalaureate program) (<i>n</i> = 266)		
Less than 1 year	6	2.27%
1-5 years	102	38.6%
6-10 years	66	25%
11-15 years	43	16.2%
More than 15	47	17.8%
Highest Degree (<i>n</i> = 266)		
Bachelors	2	0.75%
Masters	115	43.1%
Doctoral	143	53.6%
Other	7 (doctoral students)	2.62%
Previous continuing education training in nutrition (<i>n</i> = 266)		
Yes	68	25.6%
No	188	70.7%
I don't know	10	3.8%

Participants selected their area(s) of teaching expertise and could choose more than one. The most common selection was Medical-Surgical Nursing (*n* = 124, 46.6%), followed by Fundamentals (*n* = 101, 38%). Leadership (*n* = 71, 26.7%), Community

Health ($n = 65$, 24.4%), and Pediatric Nursing ($n = 55$, 20.1%) were the next three most common. Table 6 displays the data for areas of teaching expertise.

Table 6

Teaching Expertise

Area of Teaching Expertise	n	%
Fundamentals	101	38%
Pharmacology	46	17.3%
Nutrition	19	7.1%
Medical-Surgical Nursing	124	46.6%
Critical Care Nursing	44	16.5%
Mental Health Nursing	34	12.8%
Maternal-Child/Obstetrics	43	16.1%
Pediatric Nursing	55	20.1%
Community Health	65	24.4%
Leadership	71	26.7%
Public Health Nursing	44	16.5%
Other*	29	10.9%
*Ethics	1	0.38%
*Diversity and Culture	2	0.75%
*Research & EBP	4	1.5%
*Health Assessment	10	3.8%
*Gerontology	1	0.38%
*Informatics	1	0.38%
*Professional Nursing Practice	3	1.1%
*Emergency Nursing	1	0.38%
*Pathophysiology	4	1.5%
*Policy	1	0.38%

Research Questions

The KABP-TNHP was used to measure nursing faculty knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. Four research questions were examined. Descriptive statistics, bivariate correlations, and logistic regression were calculated to answer the research questions. The following sections report the findings for each research question.

Faculty Members' Content Knowledge

Research question one was: *What is prelicensure baccalaureate nursing faculty members' level of content knowledge regarding nutrition for health promotion?*

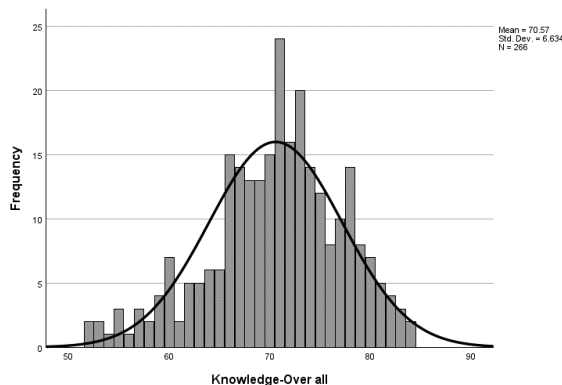
Participants' content knowledge was measured by collecting their answers to the 48 items (88 points) on the knowledge scale of the KABP-TNHP.

Data Screening

Each variable was examined for missing data, and none was found; every respondent answered every question on the scale. Knowledge scores appeared normally distributed based on visual inspection, but skewness and kurtosis statistics indicated moderate negative skew (skewness = -0.47, kurtosis = 0.07). A Kolmogorov-Smirnov test was calculated and also indicated a non-normal distribution ($D[266] = [.078]$, $p < .001$). Figure 5 displays the distribution of knowledge scores. Five (1.9%) outliers were identified and were ignored due to the low percentage overall and a negligible effect on the mean when removed ($M = 70.9$, when outliers were removed versus 70.6% with outliers retained).

Figure 5

Distribution of Knowledge Scores



Reliability of Knowledge Measure

The internal consistency of the answers to the knowledge scale was assessed using Cronbach's alpha (α). A coefficient between .7 and .9 was considered acceptable internal consistency (Portney, 2020). The Cronbach's alpha score (standardized) for the knowledge scale items was .75 ($\alpha = .75$), indicating moderate to high internal consistency, thus assuring the researcher of the reliability of the items.

Knowledge: Results

Participants' answers to the items were summed to calculate a correct score out of 88 possible points. Scores closer to 88 (100%) indicated more accurate answers and, therefore, higher knowledge of nutrition content. Knowledge scores ranged from 52 (59%) to 84 (95%). The mean score was 70.6 (80%), with a 95% confidence interval of 69.77 (79.2%) to 71.37 (81.1%). The median was 71 (80.6%), and standard deviation was 6.6.

In addition to measuring overall knowledge, knowledge within the four knowledge subscales was measured by summing the participants' scores within each subscale (Kliemann et al., 2016). The range, mean, and standard deviation of scores for each of the four knowledge subscales are displayed in Table 7.

Table 7*Means, Standard Deviations, and Confidence Intervals for Knowledge Subscales*

Knowledge Subscale	M (Points)	M (%)	SD	95% CI
Dietary recommendations (18 points possible)	13.9	77.2%	2.0	[13.6, 14.1]
Sources of nutrients (36 points possible)	28.2	78.3%	3.5	[27.8, 28.6]
Healthy food choices (13 points possible)	11.0	84.6%	1.6	[10.9, 11.2]
Diet and disease (21 points possible)	17.4	82.9%	2.0	[17.2, 17.7]

Knowledge of Dietary Recommendations. Select items in this subsection scored lower than the overall average. For example, 48.9% correctly answered a question about the recommended daily number of servings of fruit and vegetables, and 30% correctly answered a question about the recommended quantity of starchy food. A question about how many servings per week of oily fish is recommended was answered correctly by 63.5%, and 54.5% of participants correctly chose the recommended number of alcoholic beverages per day.

Knowledge of Sources of Nutrients. Some items in this section were correctly answered less often than the overall average. For example, in items asking about salt content in foods, 44% of respondents correctly identified bread, and 45.5% correctly identified breakfast cereals as being high in salt. Additionally, only about a third of participants identified the correct type of fat in olive oil (37.2%) and sunflower oil (33.0%). Just over half of the sample correctly identified the type of fat in eggs (56.8%). Furthermore, 39.5% of participants correctly identified the macronutrient containing the most calories per weight of food.

Knowledge of Healthy Food Choices. One item in this subsection appears to be an outlier. Thirty-nine percent of respondents correctly answered the item asking *if a person wanted to reduce the amount of fat in their diet but didn't want to give up French fries, which of the following foods would be the best option?* With this outlier removed, the subsection average of correct choices was 88.4%. Several items scored lower than the subsection average. A question asking about food combinations that provide the most antioxidants was answered correctly by 79% of participants. An item requiring the identification of sources of sugar in an ingredient list was answered correctly by 78% of respondents. The item asking about the food highest in kilocalories per 100 grams based on reading a food label was correctly answered by 67% of respondents.

Knowledge of Diet and Disease. The results of several items in this subsection scored lower than the overall average. For example, 69.5% of participants incorrectly chose *grazing throughout the day* as an effective strategy for maintaining a healthy weight, and nearly half (46.6%) incorrectly answered a question about the role of protein and weight management. Furthermore, 30.8% of participants could not correctly identify that a body mass index (BMI) of 32 indicated obesity.

Faculty Members' Attitudes and Beliefs

The second research question was: *What are prelicensure baccalaureate nursing faculty members' attitudes and beliefs regarding teaching nutrition as a strategy for health promotion?* The KABP-TNHP contained 10 Likert scale items that assessed attitudes and another ten items that assessed beliefs. The beliefs scale consisted of two

subscales, which were control beliefs and normative beliefs (Ajzen, 1991). The attitudes and beliefs of nursing faculty as measured by the KABP-TNHP are described.

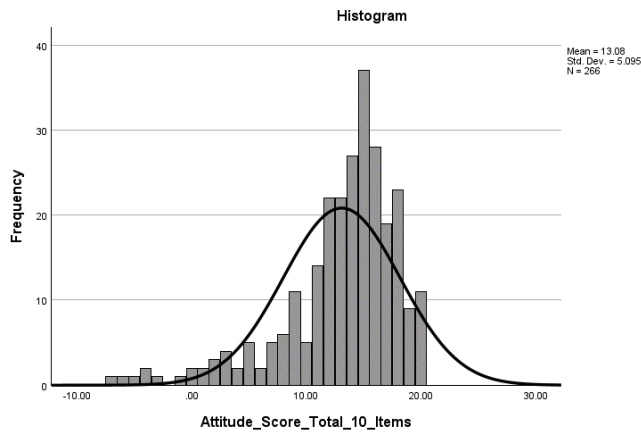
Attitudes

Each point on the five-point Likert scale used to measure attitudes was scored as follows: (a) definitely yes = 2, (b) probably yes = 1, (c) neither yes or no (neutral) = 0, (d) probably not = -1 and (e) definitely not = -2. A total score for each respondent was summed with a possible range of 20 to -20, with higher scores indicating a more positive attitude toward teaching nutrition for health promotion. Two negatively worded items were reverse-coded before analysis.

Data Screening. The attitudes scale had no missing data; every respondent answered every question. Visual inspection of a histogram, as shown in Figure 6, revealed a likely non-normal distribution, which was confirmed by skewness (-1.5, $SD = .15$), kurtosis (2.6, $SD = .30$), and Kolmogorov-Smirnov test ($D[266] = [.160]$, $p < .001$). Outliers ($n = 20$, 7.5%) were identified by boxplot examination and reviewing extreme values in SPSS. To determine the effect of the outliers on the mean, scores less than five ($n = 20$) were excluded, and the mean was recalculated ($M = 14.0$ with outliers removed versus $M = 13.1$, $SD = 5.10$ with outliers retained). Due to the minor effect of outliers on the mean, the outlying cases were retained to preserve data integrity (Portney, 2020).

Figure 6

Distribution of Attitude Scores



Reliability of Attitudes Measure. The reliability (internal consistency) of the attitudes scale of the KABP-TNHP was assessed using Cronbach's alpha coefficient and a correlation matrix. The initial Cronbach's alpha (standardized) for the ten attitudes items was .86 ($\alpha = .86$), indicating high internal consistency (Portney, 2020). Table 8 displays the means and standard deviations of the attitudes items, and Table 9 shows the correlation matrix. One item, *does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship* (Q17), had lower inter-item correlations when compared to the other items. Analysis of Cronbach's alpha (standardized) with this item (Q17) deleted was calculated, which improved the internal consistency slightly from $\alpha = .86$ to $\alpha = .88$. Since the difference was negligible and the total number of items in the scale was not large ($n = 10$) the researcher retained the item in the scale.

Table 8*Means and Standard Deviations of Attitude Items*

Item	M	SD	n
Q13-Do nurses have a professional obligation to provide counseling about nutrition for health promotion?	1.3	.7	266
Q32-Do nursing faculty have a professional obligation to teach nutrition for health promotion?	1.3	.7	266
Q17-Does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship?	2.03	1.2	266
Q15-Does health-promoting nutritional guidance provided by nurses increase patients' motivation to eat a healthy diet?	2.4	.8	266
Q21- Does nutrition for health promotion belong in pre-licensure nursing curricula?	1.2	.5	266
Q19- Does teaching nursing students about nutrition for health promotion improve nursing care?	1.5	.7	266
Q20- Does teaching nursing students about nutrition for health promotion improve patient outcomes?	1.7	.8	266
Q18- How much impact does health-promoting nutritional guidance, provided by nurses, have on patients' motivation to eat a healthy diet?	2.3	1.0	266
Q14-Is it important to incorporate nutrition for health promotion concepts into pre-licensure nursing courses?	1.2	.5	266
Q27- Would you enjoy teaching nutrition for health promotion to pre-licensure nursing students?	2.0	1.2	266

Table 9*Attitude Inter-Item Correlation Matrix*

Item	Q13	Q32	Q15	Q21	Q19	Q20	Q14	Q27	Q17	Q18
Q13	1	.71	.33	.43	.40	.42	.44	.33	.12	.27
Q32	.71	1	.29	.51	.48	.48	.57	.43	.13	.34
Q15	.33	.29	1	.24	.46	.47	.32	.27	-.03	.56
Q21	.43	.51	.24	1	.63	.48	.75	.44	.18	.25
Q19	.40	.48	.46	.63	1	.66	.69	.47	.14	.40
Q20	.42	.48	.47	.48	.66	1	.54	.35	.02	.46
Q14	.44	.57	.32	.75	.69	.54	1	.51	.01	.38
Q27	.33	.43	.27	.44	.47	.35	.51	1	.17	.32
Q17	.16	.11	.21	.08	.13	.11	.15	.12	1	.16
Q18	.27	.34	.56	.25	.40	.46	.38	.32	.31	1

Attitudes: Results. The attitude scores ranged from -7 to 20 ($n = 266$, $Mdn = 14.0$, $M = 13.1$, $SD = 5.10$, 95% CI [12.47, 13.70]). Most respondents' attitude scores fell in the top quarter of possible scores (11 or higher, $n = 212$, 79.7%), suggesting that nurses have a positive attitude toward teaching nutrition for health promotion. Ninety-three percent of respondents ($n = 248$) indicated that nursing faculty are obligated to teach nutrition for health promotion to undergraduate nursing students, and 96% ($n = 256$) indicated that nutrition for health promotion belongs in prelicensure nursing curricula. The frequencies of attitude scores grouped by quartile (range of possible scores divided into four quarters) are displayed in Table 10.

Table 10*Frequencies of Attitude Scores Grouped by Quartile*

Overall Attitude Score Quartile	n	%
11 to 20	212	79.7%
1 to 10	45	16.9 %
0 to -9	9	3.4%
-10 to -20	0	0

Note. The possible range of scores was -20 to 20

Each item's frequency was also calculated and can be seen in Table 11.

Table 11*Attitude Item Frequencies*

Item	Yes, Definitely	Yes, Probably	Neither Yes or No	Probably Not	Definitely Not
Q13-Do nurses have a professional obligation to provide counseling about nutrition for health promotion?	77.1% (n = 205)	16.2% (n = 43)	6.0% (n = 16)	0	0.7% (n = 2)
Q32-Do nursing faculty have a professional obligation to teach nutrition for health promotion?	74.4% (n = 198)	18.8% (n = 50)	5.6% (n = 15)	0.7% (n = 2)	0.4% (n = 1)
Q17-Does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship?	9.4% (n = 25)	3.4% (n = 9)	10.5% (n = 28)	34.2% (n = 91)	42.5% (n = 113)
Q15-Does health-promoting nutritional guidance provided by nurses increase patients' motivation to eat a healthy diet?	10.9% (n = 29)	49.6% (n = 132)	27.4% (n = 73)	12.0% (n = 32)	0
Q21- Does nutrition for health promotion belong in pre-licensure nursing curricula?	82.7% (n = 220)	13.5% (n = 36)	3.0% (n = 8)	0.7% (n = 2)	0
Q19- Does teaching nursing students about nutrition for health promotion improve nursing care?	65.8% (n = 175)	25.6% (n = 68)	5.3% (n = 14)	3.4% (n = 9)	0
Q20- Does teaching nursing students about nutrition for health promotion improve patient outcomes?	48.5% (n = 129)	39.1% (n = 104)	9.8% (n = 26)	2.6% (n = 7)	0
Q14-Is it important to incorporate nutrition for health promotion concepts into pre-licensure nursing courses?	79.7% (n = 212)	17.3% (n = 46)	3.0% (n = 8)	0	0

Table 11-Continued*Attitude Item Frequencies*

Item	Yes, Definitely	Yes, Probably	Neither Yes or No	Probably Not	Definitely Not
Q27- Would you enjoy teaching nutrition for health promotion to pre-licensure nursing students?	50% (n = 133)	21.8% (n = 58)	15.0% (n = 40)	9.0% (n = 24)	4.1% (n = 11)
	High Impact	Moderate Impact	Little Impact	No Impact	I Don't Know
Q18- How much impact does health-promoting nutritional guidance, provided by nurses, have on patients' motivation to eat a healthy diet?	17.7% (n = 47)	53.0% (n = 141)	18.0% (n = 48)	0	11.3 % (n = 30)

Beliefs

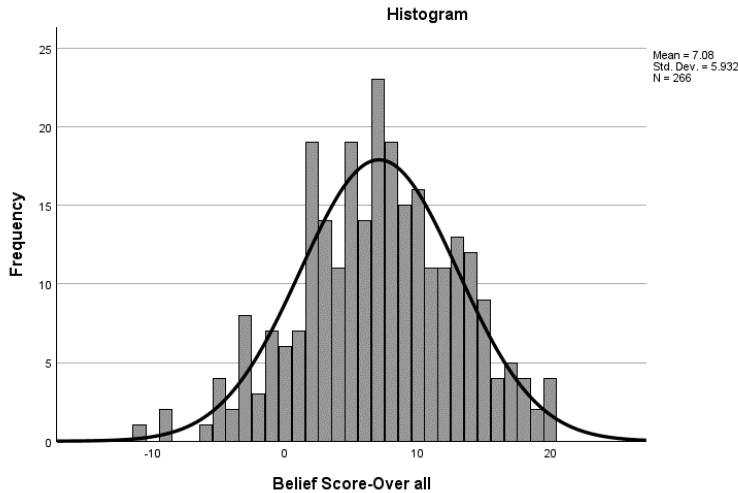
Each point on the five-point Likert scale used to measure beliefs was scored as follows: (a) definitely yes = 2, (b) probably yes = 1, (c) neither yes or no (neutral) = 0, (d) probably not = -1 and (e) definitely not = -2. A total score for each respondent was summed with a possible range of 20 to -20, with higher scores indicating beliefs more amenable towards teaching nutrition for health promotion.

Data Screening. There was no missing data in the beliefs scale; every respondent answered every question on the scale. One outlier was observed by boxplot examination and reviewing extreme values in SPSS. Removing the case made a negligible difference in the statistic mean ($M = 7.11$ with the outlier removed versus $M = 7.08$ with the outlier retained), so the outlying case was retained. The distribution of belief scores (displayed in Figure 7) appeared normally distributed upon visual inspection, but skewness and kurtosis statistics indicated moderate negative skew. The skewness statistic was -447 (SD

= .15), and the kurtosis statistic was -0.180 ($SD = .298$). The non-normal distribution was further confirmed by the Kolmogorov-Smirnov test ($D[266] = [.081]$, $p < .001$).

Figure 7

Distribution of Belief Scores



Reliability of the Beliefs Measure. The reliability (internal consistency) of the beliefs scale of the KABP-TNHP was assessed using Cronbach's alpha coefficient and a correlation matrix. The Cronbach's alpha (standardized) for the ten belief items was .81, indicating high internal consistency (Portney, 2020). As shown in Table 12, the means for each item were similar. The inter-item correlation matrix (Table 13) indicated that correlations within each predicted subscale (control beliefs and normative beliefs) were greater than the items in the other subscale.

Table 12*Means and Standard Deviations of Belief Items*

Item	M	SD	n
Control Belief Items			
Q26-Are you confident that you could teach nutrition for health promotion to pre-licensure nursing students?	1.9	0.9	266
Q22-Do you have enough time in the courses that you teach to pre-licensure nursing students, to include nutrition for health promotion?	2.7	1.2	266
Q25-Do you have the necessary knowledge to teach nutrition for health promotion to pre-licensure nursing students?	2.4	1.1	266
Q23-Do you have the necessary resources to teach nutrition for health promotion? (Examples include, but are not limited to, reference materials, pre-made instructor resources, standard curriculum, etc.)	2.5	1.3	266
Q24- How comfortable do you feel discussing nutrition for health promotion with your pre-licensure nursing students?	1.9	0.9	266
Normative Belief Items			
Q31- Do accreditors think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	2.2	0.9	266
Q130A- Do healthcare employers think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	2.5	0.9	266
Q30- Do students enrolled in your pre-licensure nursing program think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	2.6	0.9	266
Q28-Do your nursing faculty colleagues think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	2.1	0.8	266
Q29- Do your program administrators (i.e., deans, directors) think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	2.0	0.8	266

Table 13*Belief Inter-Item Correlation Matrix*

	Q26	Q22	Q25	Q23	Q24	Q31	Q130A	Q30	Q28	Q29
Q26	1	.25	.71	.42	.65	.04	.19	.21	.22	.14
Q22	.25	1	.29	.48	.32	.15	.20	.14	.24	.24
Q25	.71	.29	1	.51	.67	.05	.17	.16	.19	.25
Q23	.42	.48	.51	1	.47	.13	.21	.22	.23	.30
Q24	.65	.32	.67	.47	1	.02	.20	.14	.24	.24
Q31	.04	.15	.05	.13	.02	1	.42	.29	.34	.43
Q130A	.19	.20	.17	.21	.20	.42	1	.49	.46	.37
Q30	.21	.14	.16	.22	.14	.29	.49	1	.43	.33
Q28	.22	.24	.19	.23	.244	.34	.46	.43	1	.66
Q29	.14	.24	.25	.30	.24	.43	.37	.33	.66	1

Note: Q26, Q22, Q25, Q23, Q24 = Control Belief Items; Q31, Q130A, Q30, Q28, Q29 = Normative Belief Items

Validity of Beliefs Scale. Principle component analysis (PCA) with varimax rotation was conducted to assess the number of constructs (components) explained by the data. The PCA revealed that 57.2% of the variability in the data is explained by two components (component one Eigenvalue = 3.7 [variance explained = 30%], component two Eigenvalue = 1.97 [variance explained = 27.2%]). Examination of the scree plot confirmed a two-component explanation for the data. The rotated component matrix, as shown in Table 14, confirmed that the five control belief items loaded on one component and the five normative belief items loaded on a second component, suggesting construct validity.

Table 14*Component Loadings and Communalities for Two-Component Solution for Belief Items*

Item	Component Loading		Communality
	1	2	
Q26: Are you confident that you could teach nutrition for health promotion to prelicensure nursing students?	.83	.05	0.69
Q22: Do you have enough time, in the courses that you teach to pre-licensure nursing students, to include nutrition for health promotion?	.49	.25	0.30
Q25: Do you have the necessary knowledge to teach nutrition for health promotion to pre-licensure nursing students?	.87	.06	0.76
Q23: Do you have the necessary resources to teach nutrition for health promotion? (Examples include, but are not limited to, reference materials, pre-made instructor resources, standard curriculum, etc.)	.70	.22	0.54
Q24: How comfortable do you feel discussing nutrition for health promotion with your pre-licensure nursing students?	.84	.08	0.72
Q31: Do accreditors think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	-.05	.70	0.49
Q130A: Do healthcare employers think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	.15	.73	0.55
Q30: Do students enrolled in your pre-licensure nursing program think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	.14	.66	0.45
Q28: Do your nursing faculty colleagues think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	.20	.77	0.63
Q29: Do your program administrators (i.e., deans, directors) think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	.20	.75	0.60

Beliefs: Results. The overall belief scores ranged from -11 to 20 ($n = 266$, $M = 7.08$, $SD = 5.93$, 95% CI [6.36, 7.79]). Most respondents' belief scores fell between 1 and 10 ($n = 157$, 59.0%). The frequencies of belief scores grouped by quartile (range of possible scores divided into four quarters) are displayed in Table 15.

Table 15

Frequencies of Overall Belief Scores Grouped by Quartile

Overall Belief Score Quartiles	n	%
11 to 20	75	28.2%
1 to 10	157	59.0 %
0 to -9	33	12.4%
-10 to -20	1	0.4%

Note. The possible range of scores was -20 to 20

Each item's frequency was also calculated and can be seen in Table 16.

Table 16

Belief Item Frequencies

Item	Definitely Yes	Probably Yes	Might or might not	Probably Not	Definitely Not
Q26- Are you confident that you could teach nutrition for health promotion to pre-licensure nursing students?	38.0% (n = 101)	38.3% (n = 102)	17.7% (n = 47)	4.1% (n = 11)	1.9% (n = 5)
Q22- Do you have enough time, in the courses that you teach to pre-licensure nursing students, to include nutrition for health promotion?	17.7% (n = 47)	27.4% (n = 73)	29.3% (n = 78)	16.5% (n = 44)	9.0% (n = 24)
Q25- Do you have the necessary knowledge to teach nutrition for health promotion to pre-licensure nursing students?	20.7% (n = 55)	40.2% (n = 107)	18.0% (n = 48)	17.7% (n = 47)	3.4% (n = 9)
Q23- Do you have the necessary resources to teach nutrition for health promotion?	26.0% (n = 69)	29.3% (n = 78)	19.2% (n = 51)	17.7% (n = 47)	7.9% (n = 21)

Table 16-Continued*Belief Item Frequencies*

Item	Definitely Yes	Probably Yes	Might or might not	Probably Not	Definitely Not
Q31- Do accreditors think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	23.7% (n = 63)	38.0% (n = 101)	31.6% (n = 84)	6.4% (n = 17)	0.4% (n = 1)
Q130- Do healthcare employers think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	13.2% (n = 35)	34.2% (n = 91)	38.3% (n = 102)	13.9% (n = 37)	0.4% (n = 1)
Q30- Do students enrolled in your pre-licensure nursing program think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	11.3% (n = 30)	34.6% (n = 92)	37.6% (n = 100)	15.4% (n = 41)	1.1% (n = 3)
Q28- Do your nursing faculty colleagues think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	24.1% (n = 64)	48.5% (n = 129)	23.3% (n = 62)	4.1% (n = 11)	0
Q29- Do your program administrators (i.e., deans/directors) think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?	30.5% (n = 81)	41.3% (n = 110)	24.8% (n = 66)	3.4% (n = 9)	0
	Extremely comfortable	Somewhat comfortable	Neither	Somewhat uncomfortable	Extremely uncomfortable
Q24- How comfortable do you feel discussing nutrition for health promotion with your pre-licensure nursing students?	36.8% (n = 98)	46.2% (n = 123)	11.3% (n = 30)	4.5% (n = 12)	1.1% (n = 3)

Control Beliefs. Control beliefs may either help or hinder the ability to perform the behavior and are related to the perception that the ability, resources, and opportunities needed to perform the behavior are either present or absent (Ajzen, 1991; Ajzen, 2002). For this study, control beliefs were assessed using five positively-worded items on a five-point Likert scale. A total score was summed from the respondents' answers for a possible range of -10 to 10. Higher, positive scores indicate that faculty members believe they have the ability, resources, and opportunities to teach nutrition for health promotion.

The control belief scores ranged from -8 to 10 ($n = 266$, $M = 3.53$, $SD = 4.08$, 95% CI [3.03, 4.02]). As shown in Table 17, most scores were positive (1-10, $n = 213$, 80.1%). The distribution of control belief scores is displayed in Figure 8.

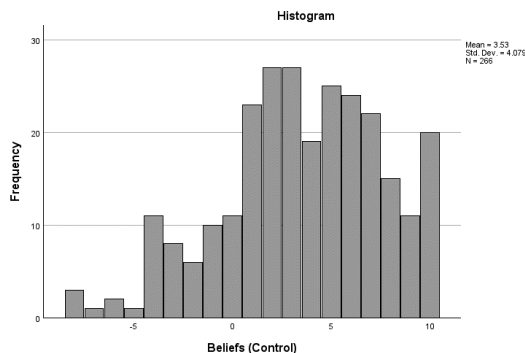
Table 17

Frequencies of Control Belief Scores Grouped by Quartile

Control Belief Score Quartiles	<i>n</i>	%
6 to 10	92	34.6%
1 to 5	121	45.4%
0 to -5	47	17.7%
-6 to -10	6	2.3%

Figure 8

Distribution of Control Belief Scores



As shown previously in Table 16, most respondents were confident they could teach nutrition for health promotion ($n = 203$, 76.3%) and would be comfortable teaching the content ($n = 221$, 83.1%). A smaller majority indicated that they have the necessary knowledge to teach nutrition for health promotion ($n = 162$, 60.9%). These three items comprise internal control beliefs. In items measuring external control beliefs, 120 (45.1%) responded affirmatively to having enough time in the curriculum and 147 (55.2%) to having the necessary resources to teach nutrition for health promotion.

Normative Beliefs. Normative beliefs arise from one's perception that significant people or groups approve (or disapprove) of a behavior (Ajzen, 1991). For this study, normative beliefs were assessed using five positively worded items on a five-point Likert scale. A total score was summed from the respondents' answers for a possible range of -10 to 10. Higher, positive scores indicate a stronger belief that teaching nutrition for health promotion is expected from the faculty members' work-related social groups.

The normative belief scores ranged from -4 to 10 ($n = 266$, $M = 3.55$, $SD = 3.19$, 95% CI [3.17, 3.93]). As shown in Table 18, most scores were positive (1-10, $n = 235$, 88.3%). The distribution of normative belief scores is displayed in Figure 9.

Table 18

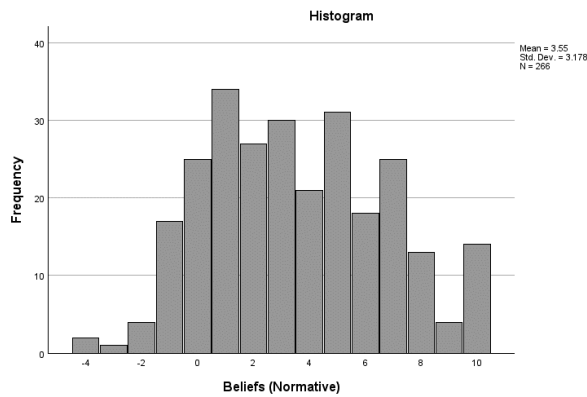
Frequencies of Normative Belief Scores Grouped by Quartile

Normative Belief Score Quartiles	<i>n</i>	%
6 to 10	92	27.8%
1 to 5	143	53.8%
0 to -5	49	18.4%
-6 to -10	6	2.3%

Note. The range of possible scores was -10 to +10.

Figure 9

Distribution of Normative Belief Scores



As previously shown in Table 16, a majority of participants definitely or probably believe that accreditors, nursing faculty colleagues, and program administrators think nutrition for health promotion should be incorporated into prelicensure nursing curricula ($n = 164$, 61.7%; $n = 193$, 72.6%; $n = 191$, 71.8%, respectively). Participants' beliefs that students ($n = 122$, 45.9%) and healthcare employers ($n = 126$, 47.4%) think that the content should be incorporated was lower.

Faculty Members' Instructional Practices

The third research question was: *What are prelicensure baccalaureate nursing faculty members' current instructional practices regarding teaching nutrition for health promotion?* Items assessing instructional practices were divided into two categories: personal experience (6 items) and curriculum (11 items). Frequencies were calculated to describe participants' instructional practices regarding teaching nutrition for health promotion.

Data Screening

There was some evidence of missing data in some of the variables assessing instructional practices, but in no variable was the missing data greater than two percent of the total and appears to occur at random, perhaps due to question formatting (matrix-style questions). The data used to assess instructional practices is categorical, so outliers and normality assessments are not applicable (Mertler & Reinhart, 2017).

Instructional Practices: Personal Teaching Experience

Just over half ($n = 154$, 57.9%) of the participants answered affirmatively about having personal experience teaching prelicensure nursing students about nutrition for health promotion. If answering yes or unsure to the personal experience item ($n = 158$), participants were asked to select the nutrition for health promotion content areas they have personal experience teaching. *Connection between diet and disease* was the most common content identified ($n = 153$). *Health benefits of eating a plant-forward diet* was the least common content area identified ($n = 83$). Table 19 lists the nutrition for health promotion content areas that faculty identified as having taught to prelicensure nursing students.

Table 19*Nutrition for Health Promotion Content Areas Taught by Faculty*

Content Area	<i>n</i>	% <i>N</i> = 158	% <i>N</i> = 266
Eating to maintain a healthy weight	130	82.2%	48.9%
Health benefits of eating a wide variety of vegetables and fruits	137	86.7%	51.5%
Health benefits of eating a plant-forward diet (i.e., emphasizes plant-based foods over animal-based foods)	83	52.5%	31.2%
Health benefits of eating a high-fiber diet	134	84.8%	80.7%
Health benefits of eating a diet rich in healthy fats (i.e., olive oil, omega-3 fats)	112	70.9%	42.1%
Health benefits of avoiding highly-processed foods	133	84.1%	50.0%
Health benefits of avoiding added sugar	135	85.4%	50.8%
Health benefits of eating whole (unprocessed) grains	122	77.2%	45.9%
Health benefits of eating fish	108	68.4%	40.6%
Health benefits of eating legumes (i.e., beans, lentils)	96	60.8%	36.1%
Health benefits of eating nuts (in moderation)	91	57.6%	34.2%
Health benefits of eating brightly-colored vegetables and fruits	112	70.9%	42.1%
Connection between diet and health	150	94.9%	56.4%
Connection between diet and disease	153	96.8%	57.5%
Other, please specify	24	15.2%	9.0%

Note: *N* = 158 reflects the number of faculty answering *yes* to having previous experience teaching nutrition for health promotion

Participants were also asked if they had personal experience teaching prelicensure nursing students how to counsel clients to make a healthy behavioral change—just over half (*n* = 150, 56.4%) answered affirmatively. In comparison, 109 (41.0%) chose *no* for this item. Those who responded affirmatively or were unsure were then presented with items asking about personal experience teaching behavior change models and health behavior change techniques. As displayed in Table 20, the most common health behavior change model chosen was the *health belief model* (*n* = 78, 51.0%), and 23 (15.0%) participants chose *none*. The most common behavior change technique taught by faculty

was goal-setting (n = 133, 84.7%). Problem-solving, social support, self-monitoring of behavior, and providing information were the next most common (see Table 21)

Table 20

Behavior Change Models Taught by Faculty

Behavior Change Models	<i>n</i>	% <i>N</i> = 153	% <i>N</i> = 266
Health Belief Model	78	51.0%	29.3%
Motivational Interviewing	59	38.6%	22.2%
Transtheoretical Model (Stages of Change)	50	32.7%	18.8%
Theory of Planned Behavior	21	13.7%	7.9%
Social Cognitive Theory (Self-Efficacy)	61	39.9%	22.9%
Other, please specify	2	1.3%	0.8%
None	23	15.0%	8.6%

Note: *N* = 153 reflects the number of faculty answering yes to having previous experience teaching nutrition for health promotion

Table 21

Behavior Change Techniques Taught by Faculty

Behavior Change Techniques	<i>n</i>	% <i>N</i> = 157	% <i>N</i> = 266
Goal Setting	133	84.7%	50.0%
Problem-Solving	101	64.3%	38.0%
Social Support	109	69.4%	41.0%
Self-Monitoring of Behavior	99	63.1%	37.2%
Providing information	108	68.8%	40.6%
Feedback on behavior	64	40.8%	24.1%
Reward for behavior	47	29.9%	17.7%
Restructuring the physical environment	62	39.5%	23.3%
Framing/Re-framing	48	30.6%	18.0%
Other, please specify	5	3.2%	1.9%
None	4	2.5%	1.5%

Note: *N* = 157 reflects the number of faculty answering yes to having previous experience teaching nutrition for health promotion

Finally, all participants were asked what teaching strategies they have personally used to promote learning about nutrition for health promotion. Sixty-six participants chose *I have never taught nutrition for health promotion*. As displayed in Table 22, the

most common strategy used was PowerPoint lecture ($n = 133$, 66.5%), followed by group discussion ($n = 107$, 53.5%) and case study ($n = 106$, 53%). A small percentage of faculty chose guided clinical experience ($n = 48$, 18.0%) and simulation ($n = 50$, 18.8%).

Table 22

Teaching Strategies Used by Faculty

Teaching Strategies	<i>n</i>	% (N = 266)	% (N = 200)*
Case study	106	39.8%	53.0%
Flipped classroom	51	19.2%	25.5%
Gaming	22	8.3%	11%
Guided clinical experience	48	18.0%	24%
Independent reading	65	24.4%	32.5%
Journal clubs	4	1.5%	2.0%
Online module	48	18.0%	24.0%
Peer learning	32	12.0%	16.0%
Pre- or post-clinical conference	71	26.7%	35.5%
PowerPoint lecture	133	50.0%	66.5%
Simulation	50	18.8%	25.0%
Group discussion	107	40.2%	53.5%
Student presentation	55	20.7%	27.5%
Other, please specify	13	4.9%	6.5%
I don't know	9	3.4%	4.5%
I have never taught nutrition for health promotion	66	24.8%	N/A

*Note: Removed 66 who chose *I have never taught...for health promotion*

Instructional Practices: Curriculum

Fifty-eight percent ($n = 154$) of respondents indicated that their prelicensure nursing program requires at least one dedicated nutrition course, while 31.5% ($n = 84$) indicated no dedicated nutrition course, and 10.5% ($n = 28$) were unsure. Respondents answering affirmatively to the question about a dedicated nutrition course were then asked follow-up questions regarding the courses. Most dedicated nutrition courses are taught by non-nursing faculty, as shown in Table 23.

Table 23*Information about Dedicated Nutrition Courses*

Item/Options	<i>n</i>	%
If pre-licensure nursing students take at least one dedicated nutrition course, which of the following is true?		
Taught by Nursing Faculty	39	25.3%
Taught by Nutrition Faculty	80	51.9%
Taught by Other*	43	27.9%
*Science Faculty	13	8.4%
*Exercise Science Faculty	8	5.2%
*Unsure	9	5.8%
*Public Health Faculty	2	1.3%
Hours of Instruction in Dedicated Nutrition Course		
16 or fewer hours	21	13.7%
17-32 hours	28	18.3%
33-48 hours	69	45.1%
49-64 hours	18	11.8%
65 or more hours	1	0.7%
I don't know	16	10.5%

Note: *N* = 153

Participants were asked about the groups of students receiving nutrition instruction for health promotion. The most common groups of students who learn about this content are those in foundational (*n* = 153, 57.5%) and prerequisite courses (*n* = 154, 57.9%). The least common groups reported were students in community nursing courses (*n* = 61, 22.9%). Table 24 lists the frequencies of student types.

Table 24*Student Types Who Learn about Nutrition for Health Promotion*

Which groups of pre-licensure students learn about nutrition for health promotion in your nursing program? Select all that apply.	<i>n</i>	%
Students in prerequisite courses	154	57.9%
Students in foundational nursing courses	157	59.0%
Students in medical-surgical nursing courses	140	52.6%
Students in specialty nursing courses (i.e. pediatrics, obstetrics)	110	41.4%
Students in dedicated nutrition courses	118	44.4%
Students in community nursing courses	66	24.8%
Other, please specify*	14	5.3%

Table 24-Continued*Student Types Who Learn about Nutrition for Health Promotion*

Which groups of pre-licensure students learn about nutrition for health promotion in your nursing program? Select all that apply.	<i>n</i>	%
Nutrition for health promotion is not taught in my program's curriculum	9	3.4%
I don't know	17	6.4%

Participants were also asked about content areas included in their programs' curriculum. The most common content taught in nursing programs was the *connection between diet and disease* ($n = 227$, 86.6%), while the least common content area was the *health benefits of eating a plant-forward diet* ($n = 46$, 20.5%). Table 25 lists the content areas taught to prelicensure nursing students.

Table 25*Nutrition for Health Promotion Content Areas in Curricula*

Nutrition for Health Promotion Content Area	<i>n</i>	%
Eating to maintain healthy weight ($N = 261$)	184	70.5%
Health benefits of eating a wide variety of vegetables and fruits ($N = 254$)	172	67.7%
Health benefits of eating a plant-forward diet (i.e., emphasizes plant-based foods over animal-based foods) ($N = 224$)	46	20.5%
Health benefits of eating a high-fiber diet ($N = 262$)	165	63.0%
Health benefits of eating a diet rich in healthy fats (i.e., olive oil, omega-3 fats) ($N = 262$)	142	54.2%
Health benefits of avoiding highly-processed foods ($N = 261$)	167	64.0%
Health benefits of avoiding added sugar ($N = 262$)	178	68.0%
Health benefits of eating whole (unprocessed) grains ($N = 261$)	142	54.4%
Health benefits of eating fish ($N = 262$)	133	50.8%
Health benefits of eating legumes (i.e., beans, lentils) ($N = 262$)	120	45.8%
Health benefits of eating nuts (in moderation) ($N = 249$)	107	43.0%
Health benefits of eating brightly-colored vegetables and fruits ($N = 261$)	137	52.5%
Connection between diet and health ($N = 262$)	222	84.7%
Connection between diet and disease ($N = 262$)	227	86.6%

Additionally, participants were asked about the presence of health behavior change models in the curriculum (Table 26). The health belief model was most commonly included ($n = 121$, 45.3%), and over a third of the sample did not know if any health behavior change models were included in the curriculum ($n = 100$, 37.6%).

Table 26

Health Behavior Change Models in Curricula

Health Behavior Change Model	<i>n</i> (<i>N</i> = 266)	%
Health Belief Model	121	45.3%
Motivational Interviewing	80	30.1%
Transtheoretical Model	81	30.5%
Theory of Planned Behavior	37	13.9%
Social Cognitive Theory	85	32.0%
Other, please specify*	6	2.3%
*Lewin's change model; Rogers' innovation-decision process theory; Lippitt/Watson/Wesley's seven phases of planned change; Havelock's six phases of planned change		
None	5	1.9%
I don't know	100	37.6%

Clinical and Simulation Learning Opportunities

Participants were asked about students' opportunities to provide health-promoting nutritional guidance in clinical experiences. One hundred and ninety-one (71.8%) indicated that students have such opportunities in clinical settings. Of these, 58 (30.4%) participants indicated that these opportunities are systematically incorporated into the curriculum, and 118 (61.8%) indicated that these experiences vary and occur randomly. Similarly, participants were asked about students' opportunities to provide health-promoting nutritional guidance during simulation experiences. One hundred (37.6%) indicated that students have such opportunities in simulation experiences. Of these, 61

(61%) indicated that these opportunities are systematically incorporated into the curriculum, and 34 (34%) indicated that these experiences vary and occur randomly.

Correlations Among Research Variables

Research question four was: *Are there correlations among prelicensure baccalaureate faculty members' level of content knowledge, attitudes, beliefs, or instructional practices?* Bivariate correlations and logistic regression were used to answer this research question.

Correlations: Knowledge, Attitudes, Beliefs

The distribution of data using scatter plots and histograms, as well as statistical tests for univariate normality (previously reported) for the variables of knowledge, attitude, overall beliefs, and control beliefs, was re-examined (Kim & Mallory, 2017; Mertler & Reinhart, 2017). As noted earlier in the analysis, the distributions of these variables did not meet the assumptions of univariate normality or linearity necessary for bivariate correlation tests (Pearson's r). Therefore, using the bootstrapping function in SPSS, resampling was performed with each bivariate correlation. Bootstrapping creates additional samples by resampling with replacement from the original sample (and so follows the population). This technique increases robustness to Type I errors in correlation tests when normality and linearity assumptions are not met and allows for the creation of confidence intervals (McCormick & Salcedo, 2017).

Bivariate correlations (Pearson r) with bootstrapping (1000 samples) were run in SPSS to calculate the correlations and confidence intervals. Using Wilkins' model as a guide, the following pairs of variables were assessed: (a) knowledge and attitudes, (b)

knowledge and overall beliefs, (c) knowledge and control beliefs, (d) attitudes and overall beliefs, and (e) attitudes and control beliefs.

Knowledge and attitude were weakly, positively correlated ($r[266] = .25, p < .001, 95\% \text{ CI } [.13, .36]$). Knowledge and overall beliefs were weakly, positively correlated ($r[266] = .25, p < .001, 95\% \text{ CI } [.14, .36]$). Knowledge and control beliefs were weakly, positively correlated ($r[266] = .33, p < .001, 95\% \text{ CI } [.23, .44]$). Beliefs and attitudes were moderately, positively correlated ($r[266] = .46, p < .001, 95\% \text{ CI } [.34, .55]$). Attitudes and control beliefs were moderately positively correlated ($r[266] = .40, p < .001, 95\% \text{ CI } [.28, .51]$).

Relationships: Knowledge, Attitudes, Beliefs and Instructional Practices

A logistic regression analysis with hierarchical entry was conducted to examine the relationships among knowledge, attitude, beliefs, and instructional practices. Instructional practices were represented by the participants' answers (yes, no, unsure) to the item *Do you have personal experience teaching students about nutrition for health promotion?* Entry was done following Wilkins' (2008) KABP model, where knowledge and attitudes precede beliefs in predicting instructional practices.

In step one of the analysis, knowledge and attitude scores were entered as predictors. The model was statistically significant, $\chi^2(1) = 12.85, p < .001$, indicating that the predictors collectively explained a significant proportion of the variance in the outcome variable. The individual contributions of knowledge ($B = -0.07, SE = 0.02, p < .001$) and attitude ($B = -0.07, SE = 0.03, p = .011$) were statistically significant.

Upon entering beliefs into the model in Step 2, the significance level of knowledge decreased (but remained significant), and attitude became nonsignificant. Nevertheless, the overall model remained significant, $\chi^2(1) = 40.35, p < .001$. Beliefs emerged as a significant predictor ($B = -.18, SE = .03, p < .001$), indicating the importance of beliefs in explaining instructional practices. Knowledge emerged as a weaker but significant predictor ($B = -.04, SE = .02, p = .049$). The effect of attitude ($B = -.006, SE = .03, p = .850$) continued to be nonsignificant.

Model fit indices revealed that the addition of beliefs slightly increased the model's goodness of fit, as evidenced by an increase in the Cox & Snell R Square (Step 1: .048; Step 2: .073) and the Nagelkerke R Square (Step 1: .064; Step 2: .098). The Hosmer and Lemeshow test suggested that goodness of fit increased from Step 1 ($\chi^2(8) = 18.04, p = .021$) to Step 2 ($\chi^2(8) = 12.27, p < .140$), suggesting that the final model adequately represents the observed data. The overall model performance remains significant, highlighting the predictive utility of the included variables. Overall, the findings suggest that beliefs and knowledge significantly contribute to the prediction of instructional practices, while the contributions of attitude are less pronounced in this context.

Chapter Summary

The statistical analyses of the research study have been presented in this chapter. Descriptive statistics were reported to describe the sample characteristics. Nursing faculty members' knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion, as measured by the KABP-TNHP, were described. Relationships among the main study variables were reported using Pearson's r and

logistic regression. In Chapter Six the significance of the study, implications for nursing education, limitations of the study, and recommendations for future research will be discussed.

CHAPTER SIX

DISCUSSION

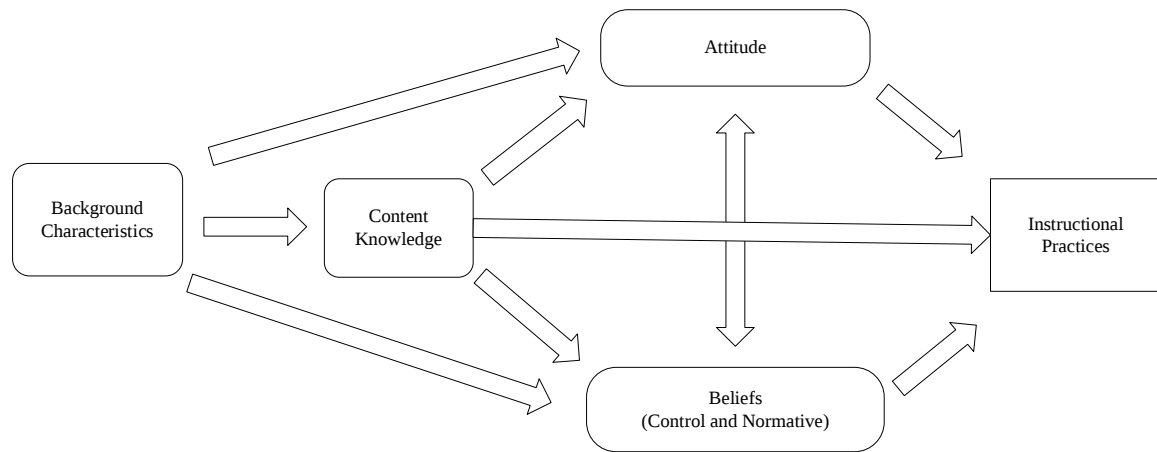
The current study aimed to describe nursing faculty members' knowledge, attitudes, beliefs, and instructional practices related to teaching nutrition for health promotion and to describe any possible correlations among the variables. In this chapter, a discussion of the findings as they relate to the integrated model for the study is presented. The implications and limitations of the study are examined. Finally, concluding remarks summarize the dissertation.

Integrated Theoretical Model for the Study

The model for the study, as discussed in Chapter Two, was an integration of the theory of planned behavior (Ajzen, 1991) and Wilkins's (2008) KABP model, which is shown again in Figure 10. Several key assumptions (discussed in Chapter Two) regarding how educators make decisions about their instructional practices are relevant to the discussion of the findings. First, educators must possess the content knowledge of the subject matter they teach (Ernest, 1989; Wilkins, 2008). Secondly, educators are more likely to incorporate new content and teaching strategies if they have a positive attitude about the benefits of such action (Ajzen, 1991; Wilkins, 2008). Lastly, educators' beliefs about their knowledge, confidence, resources, and opportunities (control beliefs) to teach content are influential factors toward the intention to adopt new content or pedagogy (Ajzen, 1991; Wilkins, 2008). Collectively, knowledge, attitudes, and beliefs will determine if faculty will put forth the effort to adopt new instructional practices to enhance knowledge attainment and competency in the learner.

Figure 10

Integrated Theoretical Model for the Study



Demographic and Background Characteristics of the Study Sample

The study sample's demographic and background characteristics were compared to those reported by the AACN (2024a). The study participants' demographic characteristics in terms of highest degree earned, gender, ethnicity, race, and age were generally similar to nursing faculty nationwide. Additionally, the study sample's geographic distribution among the four regions (Eastern, Midwest, Southern, and Western) of the United States and the percentage of study participants from public versus private institutions were comparable to that which was reported by AACN (2024a). Lastly, the study sample's rank distribution (instructor, assistant professor, associate professor, professor) was similar to the population nationwide (AACN, 2024a). Collectively, the participant's demographic characteristics are representative of nursing faculty members teaching in baccalaureate nursing programs across the United States.

Although exploring the relationship of the various background characteristics to the other variables was not part of this study, background characteristics collected in this study (i.e., years of teaching experience and educational background) may facilitate future research. Ernest (1989) and Wilkins (2008) posited that these background characteristics influence educators' knowledge, attitudes, beliefs, and instructional practices related to the subject matter that they teach.

Faculty Content Knowledge

In order to effectively teach any topic, faculty must have actual knowledge of the content (Ernest, 1989; Wilkins, 2008). The findings of the knowledge measure in the current study show that nursing faculty members' overall knowledge is not optimal for teaching nutrition for health promotion. Though no studies of nursing faculty members' nutrition knowledge were found for comparison, nutrition knowledge deficits of nurses who provide direct patient care have been consistently reported over time (Bauer et al., 2013; Boaz et al., 2013; Crogan et al., 2001; Endevelt et al., 2009; Hakonsen et al., 2018; Kable et al., 2015; Kim & Choue, 2009; Kobe, 2006); Lindseth, 1994; Lyu et al., 2021; Patil & Balai, 2021; Perry, 1997; Naser et al., 2021; Stanek et al., 14991; Zeldman & Andrade, 2020). The reported nutrition knowledge deficits of nurses who provide direct patient care are comparable to those of nursing faculty members. It cannot be assumed that nurses with graduate level education (such as nursing faculty) have increased nutrition knowledge. For example, the word "nutrition" does not appear in the published competencies for nurse practitioners (National Organization for Nurse Practitioner Faculty [NONPF], 2024), Clinical Nurse Leaders (AACN, 2013), or Nursing Faculty

(National League for Nursing [NLN], 2020); nor does it appear in the graduate-level competencies of the AACN *Essentials for Professional Nursing Education* (2021).

Furthermore, Chao et al. (2021) reported that nursing faculty who teach in graduate-level advanced practice nursing (nurse practitioner) programs do not perceive nutrition education to be adequate in these programs. Therefore, it can be concluded that the advanced education of nursing faculty members does not necessarily increase their nutrition knowledge above that which they achieved in their undergraduate preparation.

Faculty Content Knowledge: Sub-Categories

The conclusion that nursing faculty members' knowledge is not adequate for teaching nutrition for health promotion can be further substantiated by examining the findings from the sub-categories of the knowledge measure in the current study.

Knowledge deficits were found in the categories of expert recommendations, sources of nutrients, and weight management. Specifically, nursing faculty members' knowledge of expert recommendations concerning fruits and vegetables, fish intake, starchy foods, and alcoholic beverages was deficient. Many faculty members in the current study were unable to identify foods high in salt and the different types of fats in olive oil, sunflower oil, and eggs. Additionally, a substantial number of faculty members did not correctly identify foods rich in antioxidants. Lastly, knowledge gaps were found in the current study related to weight management that included healthy eating patterns, the role of protein and starch, calories per weight of food, identifying sources of sugar in food labels, and interpretation of body mass index (BMI). Given the role that diet plays in

general health and the substantial impact of being overweight on health (USDA, 2020; WHO, 2024), the knowledge gaps in these content areas are relevant and concerning.

Although there are no previous measures of nursing faculty members' nutrition knowledge for comparison, the findings of the current study do align with those that measured various aspects of nutrition knowledge of nurses who provide direct patient care. For example, Patil and Balai (2021), Naser et al. (2021), and Kable et al. (2015) all reported knowledge deficits among nurses regarding BMI interpretation. Naser et al. (2021) reported that nurses had low levels of knowledge about the percentage of calories that should come from fat.

Faculty Attitudes

The nursing faculty members in the current study had positive attitudes about the necessity and importance of teaching nutrition for health promotion and regarding the premise that teaching nutrition for health promotion improves nursing care and patient outcomes. The positive attitudes of nursing faculty members regarding the role of nutrition in promoting health and the importance of providing nutritional guidance to patients found in this study align with those of nurses found in previous studies (Boaz et al., 2013; Ilmonen et al., 2012; Kable et al., 2015; Lyu et al., 2021; Martin et al., 2013; Mekhoa et al., 2022; Naser et al., 2021). The positive attitudes found in the current and previous studies are encouraging in that they increase the likelihood that nursing faculty members will undertake the necessary effort to change their instructional practices to integrate nutrition for health promotion into their teaching (Ajzen, 1991; Wilkins, 2008)

The faculty members in the current study also had positive attitudes regarding the nurse's professional obligation to provide health-promoting nutritional guidance. This finding differs somewhat from findings in previous studies in which many nurses who provide direct patient care had negative attitudes about their responsibility to provide nutritional guidance (Boaz et al., 2013; Kable et al., 2015; Lyu et al., 2021; Naser et al., 2021). In other words, though nurses in these studies had positive attitudes about the importance of nutrition in promoting health, they had negative attitudes about the nurse's responsibility to provide nutritional guidance to patients, suggesting that they do not view nutritional guidance as part of their job responsibilities. This disparity may reflect the presence of role confusion in the nursing profession regarding the obligation to provide nutritional guidance to patients, which has been previously discussed (Chao et al., 2020; Englert et al., 1986; Kris-Etherton et al., 2014; Sacks, 2017). The positive faculty attitudes toward nursing's responsibility to provide health-promoting nutritional guidance are advantageous in that they increase the likelihood that nursing faculty members will integrate this content into their instructional practices (Ajzen, 1991; Wilkins, 2008).

Faculty Beliefs

The nursing faculty members' beliefs about teaching nutrition for health promotion in the current study were moderate; that is, neither strong nor weak. Moderate beliefs were found in the overall belief measure, as well as in each of the belief subscales (control beliefs and normative beliefs). The sub-scale findings are discussed here separately because the implications for each are unique.

Control Beliefs

Internal Control Beliefs

Control beliefs can be further reduced to internal and external control beliefs (Ajzen, 1991; Ajzen, 2002). Internal control beliefs are one's perceived confidence, comfort, and knowledge, which predict the intention to undertake a behavior or complete an action (Ajzen, 1991; Ajzen, 2002). Confidence, comfort, and perceived knowledge have also been shown in previous research to influence intent to teach new content or adopt new teaching strategies (Ernest, 1989; Wilkins, 2008). In the current study, few faculty members had strong beliefs about their perceived knowledge regarding nutrition for health promotion, and many were not fully confident in their ability to teach it. Additionally, few faculty members were completely comfortable discussing nutrition for health promotion with students. The moderate levels of perceived confidence, comfort, and knowledge suggest that nursing faculty members either lack experience in teaching nutrition for health promotion or may have clinical expertise in areas that are less traditionally focused on health promotion. To strengthen their internal control beliefs, nursing faculty members would need to acquire the necessary knowledge and gain experience in teaching this content area.

Though direct comparisons of nursing faculty members' perceived confidence, comfort, or knowledge were not found in the literature, Chao et al. (2020) did report that nursing faculty members perceived that they needed more training in nutrition in order to improve nutrition education, suggesting they did not believe that they had the necessary knowledge. Similarly, previous studies sampling nurses who provide direct patient care

have shown that perceived nutrition knowledge was low (Boaz et al., 2013; Ilmonen et al., 2012; Lyu et al., 2021; Naser et al., 2021). The comparison of findings in studies of nurses' perceived nutrition knowledge to nursing faculty members is relevant because nursing faculty members are also nurses with patient care backgrounds.

The theory of planned behavior posits that strong internal control beliefs increase the likelihood of undertaking a new behavior (Ajzen, 1991; Ajzen, 2002), and Wilkins (2008) found beliefs to be a strong predictor of an educator's intent to take on a new instructional practice. Though it is encouraging that the faculty members in the current study did not report weak internal control beliefs, the moderate responses indicate that many faculty members have internal control beliefs that do not fully support their intent to teach nutrition for health promotion.

External Control Beliefs

External control beliefs are one's perception of the availability of the necessary resources or support to perform an action; these include time, materials, or organizational barriers (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002). Many of the current study's participants were unsure if they had the necessary resources to teach nutrition for health promotion and if they had enough time in the curriculum to include this content in the courses that they teach. These findings align with the beliefs of faculty in Chao et al.'s (2020) study, who identified that a model curriculum and a web-based toolkit are resources needed in order to include more nutritional content in curricula and that they had insufficient time in the curriculum to teach nutrition.

It is not clear if the beliefs in the current or previous studies about insufficient time are belied by content saturation in the curriculum or, rather, attitudes about the importance of nutrition instruction when compared to instruction on other content. Nursing faculty members may prioritize other content as being more important than nutrition for health promotion, thus contributing to a belief that there is inadequate time to teach it. Under-prioritizing nutrition instruction in health professional preparatory programs has been well documented (Chao et al., 2020; DiMaria-Ghalili et al., 2014; Kris-Etherton et al., 2014; Livne, 2019; Sacks, 2017), however, content saturation is also a known problem in nursing programs (Giddens & Brady, 2007). It would be interesting to explore further the issue of time in the curriculum to understand better the underlying reasons for the nursing faculty members' beliefs.

Strong external control beliefs improve the likelihood that one will undertake a new behavior or complete an action (Ajzen, 1991; Ajzen, 2002). As such, the nursing faculty member's moderate external control beliefs in the current study may hinder their intention to teach nutrition for health promotion. Because of this, nursing faculty members identifying the need to improve nutrition education will need to consider the issues of resources and time when designing curricular changes.

Normative Beliefs

Normative beliefs concern one's perception that a particular behavior is expected (the norm) by significant peer groups and influence the likelihood of undertaking said behavior (Ajzen, 1991). The faculty members' normative beliefs about the expectations of important peer groups to teach nutrition for health promotion were moderate. Few

faculty members were certain about whether colleagues, accreditors, students, employers, or program administrators believe that nutrition for health promotion should be incorporated into prelicensure nursing curricula. This uncertainty may reflect general ambiguity regarding nursing's role in nutrition guidance that has been previously reported (DiMaria-Ghalili et al., 2014; Englert et al., 1986; Kris-Etherton et al., 2014; Livne, 2019; Sacks, 2017) but as this was the first known study to describe nursing faculty members' normative beliefs about teaching nutrition for health promotion, further exploration is needed. It is unclear how the nursing faculty members' normative beliefs influence their intent to teach nutrition for health promotion; however, the provision of clear expectations to include this content area in curricula from accreditors, employers, and program administrators would serve to strengthen nursing faculty members' normative beliefs and increase their intent to incorporate nutrition for health promotion into curricula systematically.

Instructional Practices

In the current study's integrated model, instructional practices are the behavioral outcome of interest. The nursing faculty members' knowledge, attitudes, and beliefs are the variables that influence their instructional practices (Ernest, 1989; Wilkins, 2008). To fully describe instructional practices related to teaching nutrition for health promotion, curricular issues at the program level (i.e., the structure of nutrition education and specific content in the curriculum), as well as the faculty members' own experience(s) in nutritional instruction, were explored.

Curriculum

Nutrition Content

Nursing faculty members in the current study indicated that nutrition content areas that are important for health promotion (USDA, 2020; WHO, 2024) are lacking in many nursing programs. For example, many prelicensure nursing programs do not teach students about the health benefits of eating fish, unprocessed whole grains, legumes, healthy fats, or brightly colored fruits and vegetables. A surprising number of faculty members were unsure if students learned about the health benefits of avoiding added sugar or highly processed foods. Although content areas specific to nutrition for health promotion have not been previously studied, the nutrition content most commonly included in prelicensure nursing curricula focused on nutritional care of the acutely ill and those with specific health conditions and not on health promotion (Chao et al., 2020; Mancin et al., 2023; Sodjinou et al., 2014). Previous research findings, combined with the findings of the current study, suggest that there is an opportunity for nursing faculty members to be more intentional about including health promotion nutrition concepts into curricula.

Curricular Structure

Providing health-promoting nutritional guidance is a complex behavior that requires knowledge, advanced communication skills, empathy, and the ability to adapt to a patient's unique needs and preferences. The findings of the current study indicate that prelicensure baccalaureate nursing students do not have adequate opportunities, systematically integrated into the curriculum, to develop the competencies necessary to

provide health-promoting nutritional guidance. In order to build competency in providing health-promoting nutritional guidance, students need not only repeated exposure to content but also opportunities to practice in simulated and real-world settings (AACN, 2021).

Most faculty members indicated that nutrition for health promotion content is delivered to students in prerequisite or foundational nursing courses; few faculty members reported fully integrated opportunities in simulation or clinical experiences to practice providing nutritional guidance. These findings are congruent with those of Sodjinou et al. (2014), who found that nutrition education in nursing programs is delivered primarily in courses taught early in the program. Furthermore, Chao et al. (2020) concluded that nursing programs do not provide adequate time and opportunity in the curricula for students to practice providing nutritional guidance. The consistency between the findings in the current study and those of previous studies is evidence that curricular revision is needed. This conclusion is further substantiated by findings in previous studies that graduates of nursing programs lack the knowledge and skills necessary to provide nutritional guidance (Laing & Crowley, 2021; Livne, 2019; Mancin et al., 2023).

Faculty Experience

Of the faculty members in the current study who indicated that their curricula included a dedicated nutrition course, only a quarter of these were taught by nursing faculty. Many faculty members indicated that they have no experience teaching nutrition for health promotion, and nearly half of the faculty reported having never taught students

how to guide clients toward healthy behavioral changes. Though the underlying reasons for the lack of previous experience are not clear, this finding suggests that nursing faculty members will need support (i.e., continuing education and resources) in order to make improvements in prelicensure nursing nutrition education.

Instructional Methods

As noted previously, providing health-promoting nutritional guidance to clients is a complex behavior that requires the synthesis of knowledge, attitude, and skill. Instructional methods and pedagogies should reflect the complexity of the learning outcome (AACN, 2023; Ernest, 1989; Wilkins, 2008). Of nursing faculty members in the current study who answered affirmatively about previous experience teaching nutrition for health promotion, the instructional methods most commonly selected were PowerPoint lectures, case studies, and group discussions, suggesting classroom-based delivery of content. Few faculty members chose simulation or guided clinical experience as an instructional method used to teach this content, which is congruent with the current study's finding (discussed previously in the curriculum section) that few programs have integrated real-life opportunities to practice providing nutritional guidance in their curricula. In previous research, Sodjinou et al. (2014) and Mancin et al. (2023) also found that nutrition education in nursing programs was primarily delivered in the didactic (lecture, classroom) setting. Mancin et al. (2023) went further to report that the use of active teaching strategies in nutrition education by nursing faculty facilitated long-term knowledge retention. Changes are needed in the instructional methods commonly used to

teach nursing students the complex behavior of providing health-promoting nutritional guidance.

Relationships between Variables

Knowledge, Attitudes, and Beliefs

Relationships among the research variables of content knowledge, attitudes, and beliefs, as depicted in the model, were explored. Faculty members with higher levels of knowledge were more likely to have positive attitudes toward teaching nutrition for health promotion. The positive relationship between knowledge and attitude found in the current study aligns with that found in previous studies showing that nurses with higher levels of nutrition knowledge are more likely to have positive attitudes about providing nutritional guidance (Bauer et al., 2015; Boaz et al., 2013; Mekhoa et al., 2022; Theila et al., 2016). The consistency of the findings regarding this relationship between the current study and those of previous studies is encouraging. Still, the implications of this finding must be considered in light of the fact that we do not fully understand how knowledge and attitudes influence each other.

The current study also showed a weak but significant relationship between nursing faculty members' knowledge and beliefs, such that those with higher knowledge levels were more likely to have strong beliefs about teaching nutrition for health promotion. The relationship found in the current study is in contrast with Wilkins' (2008) findings that educators' content knowledge and instructional beliefs were negatively correlated. This inconsistency may be explained by the differences in sample

characteristics (math teachers versus nursing faculty) and instructional topic of interest (inquiry-based math instruction versus nutrition for health promotion).

Finally, the current study found that nursing faculty members' beliefs about teaching nutrition for health promotion were positively correlated with their attitudes, which is consistent with Wilkins' (2008) finding. Though it is not known precisely how beliefs and attitudes affect each other, the positive relationship between attitudes and beliefs implies interventions that strengthen nursing faculty members' beliefs may also shift attitudes and vice versa.

The positive correlations found in the current study between the variables of knowledge, attitudes, and beliefs suggest that interventions aimed at improving any of these will improve one of the others. For example, improving nutritional knowledge through continuing education may lead to a stronger belief in one's ability to teach the material (internal control beliefs) and providing resources may increase one's external control beliefs. Future studies to better understand the impact of one variable on another would be helpful to nursing programs wishing to make improvements in nutrition education.

Knowledge, Attitudes, Beliefs, and Instructional Practices

The relationships of knowledge, attitude, and beliefs with instructional practices were also examined. Knowledge was found to have a small, positive relationship with instructional practices; that is, nursing faculty members with more content knowledge were more likely to teach nutrition for health promotion. This positive relationship between content knowledge and instructional practices aligns with Wilkin's (2008)

model. Furthermore, it supports the assumption of the integrated model of the current study, which states that faculty must have relevant content knowledge in order to teach said content.

A small, positive relationship between attitude and instructional practices was also found in that nursing faculty members with positive attitudes were more likely to teach nutrition for health promotion. The assumption of the integrated model for the study, which states that educators are more likely to incorporate new content and teaching strategies if they have a positive attitude about the benefits of such action, is supported by this finding. Furthermore, the positive relationship found in the current study aligns with findings in previous studies indicating educators' attitudes about content and instructional practices influence the likelihood of integrating said content and instructional practices into their teaching (Ernest, 1989; Akhter et al., 2021; Lyon & Houser, 2018; Raker, 2022; Sirota, 2013, Wilkins, 2008).

Lastly, a small-to-medium positive relationship between beliefs and instructional practices was found; that is, faculty members with strong beliefs are more likely to teach nutrition for health promotion. The assumption of the integrated model that educators' beliefs regarding instructional practices are influential factors toward the intention to adopt new content or pedagogy was supported by this finding. Additionally, beliefs emerged as having the strongest relationship to instructional practices when compared to knowledge and attitudes. This finding aligns with those of Wilkins (2008), who showed that educators' beliefs were the most influential predictor of intent to undertake an instructional practice.

Overall, nursing faculty members' knowledge, attitudes, and beliefs were each positively correlated with instructional practices. Of the three, beliefs was the most influential variable on the likelihood of teaching nutrition for health promotion. These relationships have implications for nursing education, which will be discussed in the next section.

Application of Findings to Integrated Theoretical Model

Viewing the findings of the current study through the lens of the integrated theoretical model (Figure 10) highlights the significance and implications of the research. Gaps in instructional practices, both in curricular content and structure, as well as in instructional methods, were found. Faculty members' content knowledge, a necessary prerequisite for effective teaching, was found to be sub-optimal. Faculty members' attitudes, however, were positive regarding the importance and necessity of teaching nutrition for health promotion. Faculty members' control and normative beliefs regarding teaching nutrition for health promotion were moderate. Since faculty beliefs emerged as having the strongest relationship to instructional practices, future interventions that strengthen these beliefs could have a positive impact on the goal of teaching nutrition for health promotion in prelicensure nursing education programs. Based on the premise of the integrated model, the positive attitudes of nursing faculty members suggest that they would support the inclusion of nutrition for health promotion into their instructional practices if they felt confident, comfortable, and knowledgeable (control beliefs) and if the expectation to do so (normative beliefs) was evident.

Implications

The current study provides a foundational understanding of nursing faculty members' content knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. The findings can benefit nursing education programs as their faculty members work to ensure that the nursing workforce is well-prepared in their pre-licensure programs to provide health-promoting nutritional guidance. The implications of the current study include continuing education, curricular revision, standardized resources, policy change, and future research.

Faculty Continuing Education

Nursing faculty members' lack of nutrition knowledge and beliefs about perceived knowledge are barriers to teaching nutrition for health promotion, therefore nutrition-focused continuing education may serve to strengthen these variables. An opportunity exists to expand nursing faculty members' knowledge of nutrition for health promotion, which will also improve perceived knowledge, confidence, and comfort (control beliefs) in teaching the material. In the current study, beliefs held the strongest relationship to instructional practices; therefore, the aim of faculty development programs should be to increase confidence and comfort in teaching the material.

Nutrition-focused continuing education programs for nurses and other health professionals have been shown to improve nutrition knowledge and confidence (Lessem et al., 2020; Lindseth, 1997; Lucas et al., 2019; Mitchell et al., 2018; Xia, 2020). Nursing program administrators can support faculty professional development by setting expectations, providing opportunities and funds for faculty to participate in continuing

education programs, and bringing in experts to provide professional development at faculty meetings or other events.

Curricular Revision

AACN's (2021) *The Essentials: Core Competencies for Professional Nursing Education* outlines the competencies that newly graduated baccalaureate nursing students are expected to attain in their educational programs. For example, graduates are expected to *educate individuals and families regarding self-care for health promotion and illness prevention*. *The Essentials* is also a call to action for nursing programs to adopt a competency-based approach, that is, to emphasize and measure the output of education (what the learner can do) as opposed to the knowledge attained (what the learner knows) and to do so across different *spheres of care*, including *Wellness and Disease Prevention* (AACN, 2021). A fundamental tenet of a competency-based approach is that students have repeated opportunities across the curriculum to practice the various facets of nursing care at progressively higher levels of difficulty and complexity (AACN, 2021; AACN, 2023).

To accomplish the goal of creating a competency-based curriculum, a “one-and-done” approach to content delivery is not acceptable (AACN, 2021). Therefore, nursing programs cannot rely on a dedicated nutrition course alone to provide all that is needed. In the current study, a slight majority of faculty indicated that their curricula included a dedicated nutrition course, most of which were taught by non-nursing faculty. For these programs, the nursing faculty will need to determine how to build from the foundational information taught in the dedicated course in order to offer repeated opportunities to

apply nutrition knowledge in actionable ways. These programs may have an advantage if there are opportunities for inter-departmental collaboration with nutrition professionals who are already teaching the dedicated nutrition course.

For programs without a dedicated nutrition course, the challenges are different in that nursing faculty will need to determine the best way to systematically integrate not only the foundational nutrition knowledge into existing courses but also the repeated and progressively more challenging opportunities for practice and competency assessment. In either model (dedicated nutrition course versus fully integrated nutrition content), nursing faculty members will be called on to teach nutrition for health promotion in multiple courses across the curriculum if it is to be truly competency-based.

Nursing faculty members' positive attitudes about the necessity of including nutrition for health promotion in the curriculum, as found in the current study, are an advantage for nursing programs seeking to revise their curricula. Nursing program administrators can support curricular review and revision by identifying champions to lead the work and providing the necessary resources. Helpful resources may include professional development opportunities, teaching load relief, and commensurate pay for the time spent on curriculum revision.

Recommended Curriculum Revision: Content

It will be necessary for faculty to ensure that essential health-promoting nutrition content is comprehensively included in the curriculum. In the current study, a substantial number of nursing faculty members indicated that important topic areas are missing from their curricula. Shea et al. (2021) provide a sample curricular integration model for

nutrition education in pre-licensure nursing education that illustrates how nutrition content can be successfully integrated without a dedicated nutrition course. DiMaria-Ghalili et al. (2016) proposed standards of care and performance competencies in nutrition for generalist nurses, which nursing faculty members could use to guide the mapping of this content throughout the curriculum.

Interprofessional collaboration with nutrition experts has been shown to enhance the effectiveness of nutrition education among professional healthcare students (DiMaria-Ghalili et al., 2016; Livne, 2019; Shea et al., 2021). Consultation with nutrition experts is essential to ensure the content is current and evidence-based. If educational institutions have dietetics or other nutrition programs, consultation with faculty from these departments is a possible solution to the problem of subject matter expertise. In the absence of such departments, outside experts can be brought in for consultation (Shea et al., 2021).

Recommended Curriculum Revision: Pedagogy

It is essential that any curriculum revision address pedagogy as well as content. In the current study, the majority of faculty named passive teaching strategies (i.e., lecture-based) as the strategy used to promote learning about nutrition for health promotion. Active learning strategies and repeated exposure are recommended to encourage the retention of knowledge and the acquisition of competencies needed to provide health-promoting nutritional guidance upon graduation (AACN, 2023; Mancin et al., 2023; Shea et al., 2021). In a competency-based approach, as recommended in *The Essentials*

(AACN, 2021), students should have multiple opportunities in different contexts and settings to practice the skills needed to achieve competency (AACN, 2023).

Guided structured clinical and simulation experiences can be designed to give students opportunities to practice providing health-promoting nutritional guidance. These experiences also provide opportunities for formative and summative competency assessment. This strategy is aligned with the mandate of the AACN to build competency-based curricula (AACN, 2021). Incorporating guided clinical and simulation experiences at multiple levels and in existing courses (i.e., changing what is currently being done versus adding more) may mitigate the concern about inadequate time in the curriculum to teach nutrition for health promotion, especially for classroom faculty who are challenged to “cover” required content in a content-saturated curriculum.

Standardized Resources

Many faculty members in the current study did not feel that they had the resources necessary to teach nutrition for health promotion. This belief, coupled with doubts about their measured and perceived knowledge in this area, provides a strong case for the development of a model curriculum with established learning outcomes, established content, and performance indicators. A model curriculum removes the burden on faculty members to develop their own materials and reduces the impact of knowledge deficits. Model curricula have been designed for other topics in nursing education, such as end-of-life nursing care, which is widely available for nursing program adoption (AACN, 2024b).

The idea of a model curriculum for nutrition education in healthcare professional preparatory programs has been suggested in the literature (DiMaria-Ghalili et al., 2016; Livne, 2019; Shea et al., 2021). A model curriculum would likely mitigate the effect of knowledge gaps, lack of confidence, or discomfort that might impede the faculty members' intent to teach the content and would be beneficial to programs that do not have easy access to nutrition experts or a dedicated nutrition course.

Policy Implications

As discussed in Chapter Two, there is no specific curricular mandate for nutrition education in nursing programs, nor are there any specific performance-based standards. Accreditors do not explicitly require nutrition for health promotion, nor is it named as a distinct topic area on the NCLEX-RN test blueprint (ACEN, 2017; CCNE, 2024; NCSBN, 2022). Systematic incorporation of this essential curricular topic in prelicensure baccalaureate programs would be enhanced by its inclusion in the NCLEX-RN test blueprint. Since faculty attitudes are positive toward teaching nutrition for health promotion, explicit requirements to include it in nursing education curricula will provide the impetus for curricular integration discussed previously in this section.

Additionally, the establishment of standardized nutrition competencies specific to the nursing profession will help to clarify nursing's role in nutritional guidance, thus enhancing the inclusion of the topic in prelicensure nursing education. Livne (2019) reported that profession-specific nutrition competencies were positively linked to healthcare professionals' nutrition knowledge and counseling skills. Furthermore, nursing-specific nutrition competencies have been suggested by DiMaria-Ghalili et al.

(2016). The establishment of an accepted set of nursing-specific nutrition competencies, complete with performance indicators, would greatly simplify the work of nursing faculty to integrate nutrition for health promotion into curricula.

Future Research

The current study was the first known to describe nursing faculty members' knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. The findings provide a foundation for future research related to nutrition education in prelicensure nursing programs. This section discusses opportunities for future research.

Faculty teaching in accredited baccalaureate nursing programs were surveyed in this study. Replicating the study in which nursing faculty members in non-accredited and associate-degree programs are sampled will provide a more comprehensive description of nursing faculty members' knowledge, attitudes, beliefs, and instructional practices. Comparing the results from these replicated studies to the results in the current study may illuminate some important implications for nutrition education in all pre-licensure programs.

Though deemed an acceptable and valid measure of nutrition knowledge for the current study, the GNKQ-R was validated and previously used mainly in lay populations. Developing a valid instrument that measures the specialized nutrition for health promotion knowledge needed by healthcare professionals would be helpful for future studies of nurses' and nursing faculty members' knowledge. No such instrument was found in the literature search.

Future nursing research should assess the effectiveness of nutrition for health promotion education in prelicensure undergraduate nursing programs to determine the best curricular integration and teaching strategies. For example, approximately half of the faculty in the current study indicated that the program in which they teach has a dedicated nutrition course. Still, it is not known if dedicated nutrition courses improve the outcome of nutrition instruction in prelicensure nursing education programs. Additionally, facilitators and barriers to nursing faculty members teaching nutrition should be explored further. Outcome-based studies that assess the nutritional guidance competencies of prelicensure nursing students are also needed. As nursing programs revise curriculum and pedagogy, research must be done to confirm best practices and assess the impact of curricular change.

Limitations

The current study's research plan was appropriate for the research questions and provides valid results with important implications for prelicensure baccalaureate nursing education programs. However, results must be considered in light of limitations.

Study limitations arise from the sampling strategy for several reasons. Nursing program administrators were asked to forward the survey to faculty, so it is unknown if all intended participants had the opportunity to complete the survey. The decision of the nursing program administrators to forward or not forward the survey may have been based on some unknown consideration (i.e., personal interest in the topic, heavy workload, organizational policies related to outside research). The *a priori* sample size ($n = 330$) was not obtained. Though the final sample size was deemed robust enough for

adequate power and generalizability, a true response rate cannot be calculated because the survey was not sent directly to participants, as discussed above. The survey timing may have played a role in restricting response rates, as the initial and second survey launches occurred in November and December, a time in the academic year when many nursing faculty members have a particularly heavy workload. Additionally, the survey was lengthy, which may have deterred some from completing it.

Generally, the demographic and background characteristics of the sample reflect those of nursing faculty nationwide, which increases the likelihood of generalizability. However, there were more white respondents (91.7%) in the study sample than in nursing faculty nationwide (74.7%, AACN, 2024a), which may introduce bias. Additionally, nursing faculty members who are more interested in nutrition may be more inclined to complete a survey related to this topic. Also, results in the curriculum section may be skewed because more than one faculty member from each nursing education program may have answered those questions, which precludes an absolute tally of how many programs cover the content. For example, it cannot be said with certainty that a given percentage of nursing programs includes a topic if several faculty members from that program answered the question.

There is a risk of measurement error in that the instrument used to assess knowledge (GNKQ-R) was not previously validated in the sample population (nursing faculty members) but was instead validated with laypersons. Because of this, the knowledge measured in the GNKQ-R may represent what is generally known about

nutrition rather than the specialized knowledge required by professional healthcare providers.

An additional limitation is caused by the fact that the attitudes and beliefs items of the instrument were self-authored. Though rigorous steps were taken to ensure the validity and reliability of these items (see Chapter Three), novel items may increase the risk of measurement error.

Conclusion

The purpose of this study was to describe the knowledge, attitudes, beliefs, and instructional practices of nursing faculty regarding teaching nutrition for health promotion. The theory of planned behavior (Ajzen, 1991) and a model by Wilkins (2008) provided the theoretical underpinnings of the study. A nationwide survey of nursing faculty members was conducted using the KABP-TNHP, an instrument composed of a previously validated measure (GNKQ-R) and researcher-authored measures. Procedures to assess the face and construct validity of the researcher-authored items were conducted, and the psychometric properties of these measures were favorable.

Gaps in instructional practices, both in curricular content and structure, as well as in instructional methods, were found. Faculty members' content knowledge, a necessary prerequisite for effective teaching, was found to be sub-optimal. Nursing faculty members' attitudes, however, were strongly positive regarding the importance and necessity of teaching nutrition for health promotion. Faculty control beliefs (confidence, perceived knowledge, resources) regarding teaching nutrition for health promotion were not strong. Weak, positive correlations were found between faculty members' knowledge

and attitudes, as well as their knowledge and beliefs. A moderate, positive correlation was found between faculty members' beliefs and attitudes. Furthermore, all three independent variables (content knowledge, attitudes, beliefs) were each positively correlated with instructional practices. Faculty members' beliefs emerged as having the strongest relationship to instructional practices, where strong beliefs increased the likelihood of teaching nutrition for health promotion.

Based on the study findings, evaluation of nutritional content in undergraduate nursing curricula is recommended and revisions may be needed.

The positive attitudes of nursing faculty members found in the study suggest that they will support the inclusion of nutrition for health promotion in curricula. However, their knowledge deficits and moderate beliefs suggest that interventions are needed that will increase faculty members' content knowledge and provide them with resources to support their teaching of this content. The recommended interventions include continuing education, as well as standardization of nutrition education curricula and competencies. These interventions are likely to strengthen the faculty members' internal and external control beliefs about teaching nutrition for health promotion.

The current study provides insight that will assist faculty in pre-licensure baccalaureate nursing programs in successfully making necessary improvements to nutrition education in nursing programs. These improvements are aligned with the curricular priorities identified by AACN (2021) and other experts (DiMaria-Ghalili et al., 2014; Livne, 2019). Academic nursing has a responsibility to help address the growing problem of diet-related chronic disease by ensuring the nursing workforce is adequately

prepared to provide health-promoting nutritional guidance. Now is a suitable time for the nursing profession to rediscover its full capacity to optimize the health of those we serve.

Appendix A

Theoretical and Operational Definitions of Study Variables

Variable	Theoretical Basis for Variable Definitions	Theoretical Definitions for Proposed Study	Operational Definition(s)	Measure
Content Knowledge	A strong command and practical understanding of the subject matter that is being taught (Ernest, 1989; Wilkins, 2008)	A practical understanding of dietary patterns that are known to prevent disease and sustain or improve health (Ernest, 1989; Harkin, 2018; Oxford University Press, 2023; Romagnolo & Selmin, 2016; USDA, 2020; Wilkins, 2008; WHO, 2022)	Percentage of correct answers on nutrition knowledge instrument	General Nutrition Knowledge Scale-R (GNKS-R)
Attitude	“...the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen, 1991, p. 188). Attitudes are formed from one’s beliefs about the benefits and downsides of the behavior (Ajzen 2001, Ajzen, 2002).	An appraisal of the effect of nursing faculty teaching nutrition for health promotion characterized on a continuum from positive to negative (Ajzen, 1991; Ajzen, 2001; Ajzen, 2002)	Score on the Likert attitude rating scale	Attitude Questionnaire
Beliefs	Control Beliefs: Perceptions about the internal and	Perceptions about teaching nutrition for health promotion that nursing faculty	Score on the Likert belief rating scale;	Beliefs Questionnaire

Variable	Theoretical Basis for Variable Definitions	Theoretical Definitions for Proposed Study	Operational Definition(s)	Measure
	external factors that give rise to perceived behavioral control; the perceived ease or difficulty of performing the behavior (Ajzen, 1991; Ajzen, 2002) Normative Beliefs: Perceptions about the expectations of others regarding the performance of the behavior (Ajzen, 1991; Ajzen, 2002)	accept as true; including internal factors (perceived ability, confidence), external factors (time, resources), and social expectations (Ajzen, 1991, Ajzen, 2002; Oxford University Press, 2023).		
Instructional Practices	Selection of content and methods used to teach the content which has a direct impact on student learning (Ernest, 1989; Wilkins, 2008)	The curriculum, content, and instructional methods that nursing faculty use to teach nutrition for health promotion, which ultimately affect student learning (Ernest, 1989; Oxford University Press, 2023; Wilkins, 2008)	Answers to questions regarding instructional practices pertaining to teaching nutrition for health promotion.	Instructional Practices Questionnaire

Appendix B

Knowledge, Attitudes, Beliefs, and Instructional Practices-Teaching Nutrition for Health Promotion (KABP-TNHP)

Start of Block: IRB

Q1

Information Sheet for Exempt Survey Research

Nutrition for Health Promotion in Nursing Education: The Knowledge, Attitudes, Beliefs, and Practices of Nursing Faculty

Introduction

You are being asked to be in a research study that is being done by Tracy Alberta, Ph.D. candidate, working under the direction of Dr. Julia Paul, Associate Professor in the School of Nursing at Oakland University in southeast Michigan. Your decision to participate in this study is voluntary. You can stop your participation at any time or skip any part of the study if you are uncomfortable. Your decision will not affect your present or future relationship with Oakland University, the researcher, or the School of Nursing. If you are a student or an Oakland University employee, your participation decision will not affect your grades or employment status.

What is the purpose of this study?

This research study aims to describe nursing faculty knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. Who can participate in this study? You are being asked to participate in the study because you are a full-time nursing faculty member in a pre-licensure baccalaureate program.

What do I have to do?

You will be asked to complete a survey about your knowledge, attitudes, beliefs, and current instructional practices regarding teaching nutrition for health promotion. The survey will be done online and **will take approximately 30 minutes to complete.**

Are there any risks to me?

For this study, the potential risks are minimal. Any possible risks are related to the risks inherent in using a computer or mobile device, including, but not limited to, eye strain, muscle tension, and overuse injuries of wrists and hands. The length of this survey is not likely to cause these problems, but they can be minimized by taking frequent breaks. The survey is anonymous. No identifiable data that can directly be linked to you are collected. If you agree to participate in this research study, you will be asked to complete the survey online at a time and place of your choosing. After completing the survey, you will be redirected to an optional SECOND, SEPARATE survey. This survey will ask for your name and email address. Your contact information will be used for a drawing to receive one of four Amazon gift cards valued at \$50. This information will not be linked to your data in any way.

Are there any benefits to me?

There may be no direct benefits to participants. However, the results of this study may benefit others in the future. Participation in this research will help to create a foundation of information that pre-licensure nursing programs can use to revise the curriculum, improve pedagogy, and establish competencies for teaching nutrition for health promotion. Ultimately, findings from this research may lead to a better-prepared nursing workforce to promote health and wellness.

Will I receive anything for participating?

Once you complete the survey, you can access a second, separate survey (optional) that will ask for your name and email address. This information will be used for entry into a raffle to win one of four Amazon gift cards valued at fifty dollars. Once data collection is complete, four names will be randomly selected via Qualtrics, which allows the raffle winners' names to remain inaccessible to the researcher. Again, the names and addresses collected via this secondary survey will NOT be linked to any data.

What if I want to stop participating in this study?

If you want to stop participating, close your browser before completing and submitting the survey. If you wish to stop your participation after submitting the survey, please contact the researcher.

Who can I contact if I have questions about this study?

If you have any questions about the research, please contact me at talberta@oakland.edu or 517-526-2045. Dr. Julia Paul, my faculty advisor, can be reached at jcpaul@oakland.edu or (248) 364-8796. For questions regarding your rights as a participant in human subject research, you may contact the Oakland University Institutional Review Board at 248-370-4898.

☐ I agree to participate in this research study

End of Block: IRB

Start of Block: Screening Questions

Q1 Are you employed as a full-time nursing faculty member?

☐ Yes

☐ No

Q2 Do you have at least one year of experience teaching didactic (i.e. lecture, classroom) in a pre-licensure nursing program?

☐ Yes

☐ No

Q3 Do you teach nursing courses in a pre-licensure nursing program?

☐ Yes

☐ No

Q4 Please choose the description that best matches the type of pre-licensure nursing course(s) that you teach? **Select all that apply.**

- ☐ Fundamentals/Foundations
 - ☐ Medical-Surgical
 - ☐ Pharmacology
 - ☐ Pediatrics
 - ☐ Maternal-Child/Obstetrics
 - ☐ Mental Health/Psychiatric
 - ☐ Nutrition
 - ☐ Health Promotion
 - ☐ Community/Public Health Nursing
 - ☐ Leadership
 - ☐ Capstone
 - ☐ Research/Evidence-Based Practice
 - ☐ Other, please specify _____
-

Display This Question:

If Are you employed as a full-time nursing faculty member? = No

Or Do you have at least one year of experience teaching didactic (i.e. lecture, classroom) in a pre-... = No

Or Do you teach nursing courses in a pre-licensure nursing program? = No

Q108 Thank you for your willingness to participate in this survey. Have a nice day!

Skip To: End of Survey If Thank you for your willingness to participate in this survey. Have a nice day! Is Displayed

End of Block: Screening Questions

Start of Block: Knowledge

GNKQ General Nutrition Knowledge This is a survey, not a test. Your answers will be used to measure what nursing faculty know about general nutrition. It is important that you complete it by yourself and without looking up any answers. Your answers will remain anonymous. If you don't know the answer, mark "not sure" rather than guess.

Q110 The first few items are about what advice you think experts are giving us.



Q109 Do health experts recommend that people should be eating more, the same amount, or less of the following foods?

	More	Same	Less	Not sure
Fruit	☐	☐	☐	☐
Food and drinks with added sugar	☐	☐	☐	☐
Vegetables	☐	☐	☐	☐
Fatty foods	☐	☐	☐	☐
Processed red meat	☐	☐	☐	☐
Whole grains	☐	☐	☐	☐
Salty foods	☐	☐	☐	☐
Water	☐	☐	☐	☐

Q111 How many servings of fruit and vegetables per day do experts advise people to eat as a minimum? (One serving could be, for example, an apple or a handful of chopped carrots)

- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ Not sure
-

Q112 Which of these types of fats do experts recommend that people should eat less of?

	Eat less	Not eat less	Not sure
Unsaturated fats	☐	☐	☐
Trans fats	☐	☐	☐
Saturated fats	☐	☐	☐

Page Break

Q113 Which type of dairy foods do experts say people should drink?

- ☐ Full fat (e.g., full fat milk)
 - ☐ Reduced fat (e.g., skim and 2% milk)
 - ☐ Mixture of full fat and reduced fat
 - ☐ Neither, dairy foods should be avoided
 - ☐ Not sure
-

Q115 How many times per week do experts recommend that people eat oily fish (e.g. salmon and mackerel)?

- ☐ 1-2 times per week
 - ☐ 3-4 times per week
 - ☐ Every day
 - ☐ Not sure
-

Q116 Approximately how many alcoholic drinks is the maximum recommended per day (The exact number depends on the size and strength of the drink)?

- ☐ 1 drink each for men and women
 - ☐ 2 drinks each for men and women
 - ☐ 2 drinks for men and 1 drink for women
 - ☐ 3 drinks for men and 2 drinks for women
 - ☐ Not sure
-

Page Break

Q114 How many times per week do experts recommend that people eat breakfast?

- ☐ 3 times per week
 - ☐ 4 times per week
 - ☐ Every day
 - ☐ Not sure
-

Q117 If a person has two glasses of fruit juice in a day, how many of their daily fruit and vegetable servings would this count as?

- ☐ None
 - ☐ One serving
 - ☐ Two servings
 - ☐ Three servings
 - ☐ Not sure
-

Q118 According to the 'MyPlate' guide (a guideline showing the proportions of food types people should eat to have a balanced and healthy diet), how much of a person's diet should be made up of starchy foods?

- ☐ 25%
 - ☐ 30%
 - ☐ 50%
 - ☐ Not sure
-

Page Break

Q120 Experts classify foods into groups. We are interested to see whether people are aware of food groups and the nutrients they contain.

Q119 Do you think these foods are typically high or low in added sugar?

	High in added sugar	Low in added sugar	Not sure
Diet sodas	☐	☐	☐
Plain yogurt	☐	☐	☐
Ice cream	☐	☐	☐
Tomato ketchup	☐	☐	☐
Melon	☐	☐	☐

Page Break

Q121 Do you think these foods are typically high or low in salt?

	High in salt	Low in salt	Not sure
Breakfast cereals	☐	☐	☐
Frozen vegetables	☐	☐	☐
Bread	☐	☐	☐
Baked beans	☐	☐	☐
Red meat	☐	☐	☐
Canned soup	☐	☐	☐

Page Break

Q122 Do you think these foods are typically high or low in fiber?

	High in fiber	Low in fiber	Not sure
Oats	☐	☐	☐
Bananas	☐	☐	☐
White rice	☐	☐	☐
Eggs	☐	☐	☐
Potatoes with skin	☐	☐	☐
Pasta	☐	☐	☐

Page Break

Q123 Do you think these foods are a good source of protein?

	Good source of protein	Not a good source of protein	Not sure
Poultry	☐	☐	☐
Cheese	☐	☐	☐
Fruit	☐	☐	☐
Baked beans	☐	☐	☐
Butter	☐	☐	☐
Nuts	☐	☐	☐

Page Break

Q124 Which of the following foods do experts count as a starchy food?

	Starchy food	Not a starchy food	Not sure
Cheese	☐	☐	☐
Pasta	☐	☐	☐
Potatoes	☐	☐	☐
Nuts	☐	☐	☐
Plantains	☐	☐	☐

Page Break

Q125 Which is the main type of fat present in each of the following foods?

	Polyunsaturated fat	Monounsaturated fat	Saturated fat	Cholesterol	Not sure
Olive oil	☐	☐	☐	☐	☐
Butter	☐	☐	☐	☐	☐
Sunflower oil	☐	☐	☐	☐	☐
Eggs	☐	☐	☐	☐	☐

Page Break

Q127 Which of these foods has the most trans fats?

- ☐ Cookies, cakes, and pastries
- ☐ Fish
- ☐ Canola oil
- ☐ Eggs
- ☐ Not sure

Q128 The amount of calcium in a glass of whole milk compared to a glass of skimmed milk is:

- ☐ About the same
 - ☐ Much higher
 - ☐ Much lower
 - ☐ Not sure
-

Page Break

Q129 Which of the following nutrients has the most calories for the same weight of food?

- ☐ Sugar
- ☐ Starchy
- ☐ Fiber/roughage
- ☐ Fat
- ☐ Not sure

Q130 Compared to minimally processed foods, processed foods are:

- ☐ Higher in calories
 - ☐ Higher in fiber
 - ☐ Lower in salt
 - ☐ Not sure
-

Page Break

Q131 The next few items are about choosing foods

Q132 If a person wanted to buy a yogurt at the supermarket, which would have the least sugar/sweetener?

- ☐ 0% fat cherry yogurt
- ☐ Plain yogurt
- ☐ Creamy fruit yogurt
- ☐ Not sure

Q133 If a person wanted soup in a restaurant or cafe, which one would be the lowest fat option?

- ☐ Mushroom risotto soup (field mushrooms, porcini mushrooms, arborio rice, butter, cream, parsley and cracked black pepper)
 - ☐ Carrot butternut and spice soup (carrot , butternut squash, sweet potato, cumin, red chilies, coriander seeds and lemon)
 - ☐ Cream of chicken soup (chicken, onions, carrots, celery, potatoes, garlic, sage, wheat flour, double cream)
 - ☐ Not sure
-

Q134 Which would be the healthiest and most balanced choice of main meal in a restaurant?

- ☐ Roast turkey, mashed potatoes, and vegetables
- ☐ Beef, dinner roll, and roast potatoes
- ☐ Breaded fried fish and french fries served with peas and tartar sauce
- ☐ Not sure

Page Break

Q135 Which would be the healthiest and most balanced sandwich lunch?

- ☐ Ham sandwich + fruit + blueberry muffin + fruit juice
 - ☐ Tuna salad sandwich + fruit + low fat yogurt + water
 - ☐ Egg salad sandwich + chips + low fat yogurt + water
 - ☐ Not sure
-

Q136 Which of these foods would be the healthiest choice for dessert?

- ☐ Berry sorbet
- ☐ Apple and blackberry pie
- ☐ Lemon cheesecake
- ☐ Carrot cake with cream cheese topping
- ☐ Not sure

Q137 Which of these combinations of vegetables in a salad would give the greatest variety of vitamins and antioxidants?

- ☐ Lettuce, green peppers, and cabbage
 - ☐ Broccoli, carrot, and tomatoes
 - ☐ Red peppers, tomatoes, and lettuce
 - ☐ Not sure
-

Page Break

Q138 If a person wanted to reduce the amount of fat in their diet but didn't want to give up French fries, which of the following foods would be the best option?

- ☐ Thick cut fries
 - ☐ Thin cut fries
 - ☐ Crinkle cut fries
 - ☐ Not sure
-

Q139 One healthy way to add flavor to food without adding extra fat or salt is:

- ☐ Coconut milk
 - ☐ Herbs
 - ☐ Soy sauce
 - ☐ Not sure
-

Q140 Which of the following cooking methods requires fat to be added?

- ☐ Grilling
 - ☐ Steaming
 - ☐ Baking
 - ☐ Sauteing
 - ☐ Not sure
-

Page Break

Q141 Traffic lights are often used on nutrition labeling. What would yellow mean for the fat content of a food?

- ☐ Low fat
 - ☐ Medium fat
 - ☐ High fat
 - ☐ Not sure
-

Q142 "Light" foods (or diet foods) are always good options because they are low in calories

- ☐ Agree
 - ☐ Disagree
 - ☐ Not sure
-

Page Break

Q144 The following questions are related to food labels:

Q145 Looking at products 1 and 2, which one has the most calories (kcal) per 100 grams?

- ☐ Product 1
 - ☐ Product 2
 - ☐ Both have the same quantity
 - ☐ Not sure
-

Q146 Looking at product 1, what are the sources of sugar in the ingredients list?

- ☐ Sugar and malt syrup
 - ☐ Sugar, fructose, and lecithin
 - ☐ Sugar, fructose, and malt syrup
 - ☐ Not sure
-

Page Break

Q147 This next section is about health problems or diseases related to diet and weight management.

Q148 Which of these diseases is related to a low intake of fiber?

- ☐ Bowel disorders
 - ☐ Anemia
 - ☐ Tooth decay
 - ☐ Not sure
-

Q149 Which of these diseases is related to how much sugar you eat?

- ☐ High blood pressure
 - ☐ Tooth decay
 - ☐ Anemia
 - ☐ Not sure
-

Q150 Which of these diseases is related to how much salt and sodium you eat?

- ☐ Hypothyroidism
 - ☐ Diabetes
 - ☐ High blood pressure
 - ☐ Not sure
-

Page Break

Q151 Which of these options do experts recommend to reduce the chances of getting cancer?

- ☐ Drinking alcohol regularly
- ☐ Eating less red meat
- ☐ Avoiding additives in food
- ☐ Not sure

Q152 Which of these options do experts recommend to prevent heart disease?

- ☐ Taking nutritional supplements
- ☐ Eating less oily fish
- ☐ Eating less trans fats
- ☐ Not sure

Q153 Which of these options do experts recommend to prevent diabetes?

- ☐ Eating less refined foods
 - ☐ Drinking more fruit juice
 - ☐ Eating more processed meat
 - ☐ Not sure
-

Page Break

Q154 Which one of these foods is more likely to raise people's blood cholesterol?

- ☐ Eggs
 - ☐ Vegetable oils
 - ☐ Animal fat
 - ☐ Not sure
-

Q155 Which one of these foods is classified as having a high Glycemic Index (Glycemic Index is a measure of the impact of a food on blood sugar levels, thus a high Glycemic Index means a greater rise in blood sugar after eating)?

- ☐ Wholegrain cereals
- ☐ White bread
- ☐ Fruits and vegetables
- ☐ Not sure

Q156 To maintain a healthy weight people should cut fat out completely

- ☐ Agree
 - ☐ Disagree
 - ☐ Not sure
-

Page Break

Q157 To maintain a healthy weight people should eat a high protein diet

- ☐ Agree
 - ☐ Disagree
 - ☐ Not sure
-

Q158 Eating bread always causes weight gain

- ☐ Agree
 - ☐ Disagree
 - ☐ Not sure
-

Q159 Fiber can decrease the chances of gaining weight

- ☐ Agree
 - ☐ Disagree
 - ☐ Not sure
-

Page Break

Q160 Which of these options can help people to maintain a healthy weight?

	Yes	No	Not sure
Not eating while watching TV	☐	☐	☐
Reading food labels	☐	☐	☐
Taking nutritional supplements	☐	☐	☐
Monitoring their eating	☐	☐	☐
Monitoring their weight	☐	☐	☐
Grazing throughout the day	☐	☐	☐

Page Break

Q161 If someone has a body mass index (BMI) of 23, what would their weight status be?

- ☐ Underweight
 - ☐ Normal weight
 - ☐ Overweight
 - ☐ Obese
 - ☐ Not sure
-

Q162 If someone has a body mass index (BMI) of 32, what would their weight status be?

- ☐ Underweight
- ☐ Normal weight
- ☐ Overweight
- ☐ Obese
- ☐ Not sure

Q163 Look at the body shapes below:

Which of these body shapes increases the risk of cardiovascular disease? (*Cardiovascular disease is a general term that describes a disease of the heart or blood vessels, for example, angina, heart attack, heart failure, congenital heart disease and stroke*)?

- ☐ Apple shape
- ☐ Pear shape
- ☐ Not sure

End of Block: Knowledge

Start of Block: Attitudes

Q122 The next section of the survey asks about your thoughts about teaching nutrition for health promotion. Please answer based on your own opinions. To facilitate your understanding of the questions, these definitions may be helpful:

1. Nutrition for health promotion: A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease. Also, avoiding foods or food-like substances that are known to contribute to poor health

2. Teaching nutrition for health promotion: The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners

Q13 Do nurses have a professional obligation to provide counseling about nutrition for health promotion?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q32 Do nursing faculty have a professional obligation to teach nutrition for health promotion?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q17 Does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q15 Does health-promoting nutritional guidance provided by nurses increase patients' motivation to eat a healthy diet?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q21 Does nutrition for health promotion belong in pre-licensure nursing curricula?

- ☐ Yes, definitely
- ☐ Yes, probably
- ☐ Neither yes or no (neutral)
- ☐ Probably not
- ☐ Definitely not

Q19 Does teaching nursing students about nutrition for health promotion improve nursing care?

- ☐ Yes, definitely
- ☐ Yes, probably
- ☐ Neither yes or no (neutral)
- ☐ Probably not
- ☐ Definitely not

Q20 Does teaching nursing students about nutrition for health promotion improve patient outcomes?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q18 How much impact does health-promoting nutritional guidance, provided by nurses, have on patients' motivation to eat a healthy diet?

- ☐ High impact
 - ☐ Moderate impact
 - ☐ Little impact
 - ☐ No impact
 - ☐ I don't know
-

Q14 Is it important to incorporate nutrition for health promotion concepts into pre-licensure nursing courses?

- ☐ Yes, definitely
 - ☐ Yes, probably
 - ☐ Neither yes or no (neutral)
 - ☐ Probably not
 - ☐ Definitely not
-

Q27 Would you enjoy teaching nutrition for health promotion to pre-licensure nursing students?

- ☐ Definitely not
- ☐ Probably not
- ☐ Might or might not
- ☐ Probably yes
- ☐ Definitely yes

End of Block: Attitudes

Start of Block: Beliefs

Q1 As a reminder, here are those definitions again.

1. Nutrition for health promotion: A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease; Also, avoiding foods or food-like substances that are known to contribute to poor health

2. Teaching nutrition for health promotion: The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners

Q26 Are you confident that you could teach nutrition for health promotion to pre-licensure nursing students?

- ☐ Definitely not
 - ☐ Probably not
 - ☐ Might or might not
 - ☐ Probably yes
 - ☐ Definitely yes
-

Q22 Do you have enough time, in the courses that you teach to pre-licensure nursing students, to include nutrition for health promotion?

- ☐ Definitely yes
 - ☐ Probably yes
 - ☐ Might or might not
 - ☐ Probably not
 - ☐ Definitely not
-

Q25 Do you have the necessary knowledge to teach nutrition for health promotion to pre-licensure nursing students?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

Q23 Do you have the necessary resources to teach nutrition for health promotion? (Examples include, but are not limited to, reference materials, pre-made instructor resources, standard curriculum, etc.)

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

Q24 How comfortable do you feel discussing nutrition for health promotion with your pre-licensure nursing students?

- ☐ Extremely uncomfortable
- ☐ Somewhat uncomfortable
- ☐ Neither comfortable nor uncomfortable
- ☐ Somewhat comfortable

☐ Extremely comfortable

Q31 Do accreditors think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?

☐ Definitely yes

☐ Probably yes

☐ Might or might not

☐ Probably not

☐ Definitely not

Q130 Do healthcare employers think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

Q30 Do students enrolled in your pre-licensure nursing program think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?

- ☐ Definitely yes
 - ☐ Probably yes
 - ☐ Might or might not
 - ☐ Probably not
 - ☐ Definitely not
-

Q28 Do your nursing faculty colleagues think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?

- ☐ Definitely yes
 - ☐ Probably yes
 - ☐ Might or might not
 - ☐ Probably not
 - ☐ Definitely not
-

Q29 Do your program administrators (i.e. deans, directors) think nutrition for health promotion concepts should be incorporated into pre-licensure nursing curricula?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

End of Block: Beliefs

Start of Block: Instructional Practices

Q126 The next section asks about your pre-licensure nursing program's curriculum and your personal experience regarding teaching nutrition for health promotion. If you don't know the answer, please select 'I don't know' rather than guess.

Please answer these questions in the context of the definition of teaching nutrition for health promotion, which is:

The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners

Q1 Which groups of pre-licensure students learn about nutrition for health promotion in your nursing program? **Select all that apply.**

- ☐ Students in prerequisite courses
- ☐ Students in foundational nursing courses
- ☐ Students in medical-surgical nursing courses
- ☐ Students in specialty nursing courses (i.e. pediatrics, obstetrics)
- ☐ Students in dedicated nutrition courses
- ☐ Students in community nursing courses
- ☐ Other (please specify) _____
- ☐ Nutrition for health promotion is not taught in my program's curriculum
- ☐ I don't know

Q2 Do pre-licensure nursing students in your nursing program's curriculum, take at least one dedicated nutrition course?

☐ Yes

☐ No

☐ I don't know

Display This Question:

If Do pre-licensure nursing students in your nursing program's curriculum, take at least one dedicat...
= Yes

Q129 If pre-licensure nursing students take at least one dedicated nutrition course, which of the following is true? **Select all that apply.**

☐

Dedicated nutrition courses are taught by nursing faculty

☐

Dedicated nutrition courses are taught by nutrition faculty

☐

Dedicated nutrition courses are taught by other (please specify)

Display This Question:

If Do pre-licensure nursing students in your nursing program's curriculum, take at least one dedicat...
= Yes

Q3 How many hours of instruction is provided in **dedicated nutrition courses** to pre-licensure nursing students in your program? (For example, a one-credit course is approximately 16 hours of instruction)

- ☐ 16 or fewer hours
 - ☐ 17-32 hours
 - ☐ 33-48 hours
 - ☐ 49-64 hours
 - ☐ 65 or more hours
 - ☐ I don't know
-

Page Break

Q4 Do pre-licensure students in your nursing program have opportunities in their clinical experiences to provide health-promoting nutritional guidance for clients?

- ☐ Yes
 - ☐ No
 - ☐ I don't know
-

Page Break

Display This Question:

If Do pre-licensure students in your nursing program have opportunities in their clinical experience... = Yes

Q6 In your pre-licensure nursing program, which of the following is true about opportunities to provide health-promoting nutritional guidance in clinical experiences?

- ☐ Opportunities to provide health-promoting nutritional guidance in clinical experiences are systematically incorporated into the curriculum (i.e., all students have the same opportunities)
- ☐ Opportunities to provide health-promoting nutritional guidance in clinical experiences vary (i.e., the opportunities are random and/or not systematically delivered to all students)
- ☐ Other (please specify) _____
- ☐ I don't know

Page Break

Q5 Do pre-licensure students in your nursing program have opportunities in simulation experiences to provide health-promoting nutritional guidance for clients?

- ☐ Yes
- ☐ No
- ☐ I don't know

Display This Question:

If Do pre-licensure students in your nursing program have opportunities in simulation experiences to...
= Yes

Q7 In your pre-licensure nursing program, which of the following is true about opportunities to provide health-promoting nutritional guidance in simulation?

- ☐ Opportunities to provide health-promoting nutritional guidance in simulation are systematically incorporated into the curriculum (i.e., all students have the same opportunities)
- ☐ Opportunities to provide health-promoting nutritional guidance in simulation vary (i.e., the opportunities are random and/or not systematically delivered to all students)
- ☐ Other (please specify) _____
- ☐ I don't know

Page Break _____



Q8 Which of the following content areas do pre-licensure students in your nursing program learn about?

	Yes, present in the curriculum	No, not present in the curriculum	I don't know
Eating to maintain a healthy weight	☐	☐	☐
Health benefits of eating a wide variety of vegetables and fruits	☐	☐	☐
Health benefits of eating a plant-forward diet (i.e., emphasizes plant-based foods over animal-based foods)?	☐	☐	☐
Health benefits of eating a high-fiber diet	☐	☐	☐
Health benefits of eating a diet rich in healthy fats (i.e., olive oil, omega-3 fats)	☐	☐	☐
Health benefits of avoiding highly-processed foods	☐	☐	☐
Health benefits of avoiding added sugar	☐	☐	☐
Health benefits of eating whole (unprocessed) grains	☐	☐	☐
Health benefits of eating fish	☐	☐	☐
Health benefits of eating legumes (i.e., beans, lentils)	☐	☐	☐
Health benefits of eating nuts (in moderation)	☐	☐	☐
Health benefits of eating brightly-colored vegetables and fruits	☐	☐	☐
Connection between diet and health	☐	☐	☐

Connection between
diet and disease

☐☐☐

Other, please specify

☐☐☐

Page Break

Q9 In your nursing program, which of the following health behavior change models do pre-licensure students learn about? **Select all that apply.**

☐

Health Belief Model

☐

Motivational Interviewing

☐

Transtheoretical Model (Stages of Change)

☐

Theory of Planned Behavior

☐

Social Cognitive Theory (Self-Efficacy)

☐

Other, please specify _____

☐

None

☐

I don't know



Q10 In your nursing program, which of the following health behavior change techniques or strategies do pre-licensure students learn about?

	Yes, present in curriculum	No, not present in curriculum	I don't know
Goal-setting	☐	☐	☐
Problem-solving	☐	☐	☐
Social support	☐	☐	☐
Self-monitoring of behavior	☐	☐	☐
Providing information about health consequences	☐	☐	☐
Feedback on behavior	☐	☐	☐
Reward for behavior	☐	☐	☐
Restructuring the physical environment	☐	☐	☐
Framing/Re-framing	☐	☐	☐
Other, please specify	☐	☐	☐

Page Break

Q11 Do you have personal experience teaching pre-licensure nursing students about nutrition for health promotion?

☐ Yes

☐ No

☐ Unsure

Display This Question:

If Do you have personal experience teaching pre-licensure nursing students about nutrition for health... = Yes

Or Do you have personal experience teaching pre-licensure nursing students about nutrition for health... = Unsure



Q15 Considering your personal teaching experience, which of the following nutrition for health promotion content areas **have you taught** to pre-licensure nursing students?

	Yes, I have experience teaching this content	No, I have not taught this content before	I don't know
Eating to maintain a healthy weight	☐	☐	☐
Health benefits of eating a wide variety of vegetables and fruits	☐	☐	☐
Health benefits of eating a plant-forward diet (i.e., emphasizes plant-based foods over animal-based foods)?	☐	☐	☐
Health benefits of eating a high-fiber diet	☐	☐	☐
Health benefits of eating a diet rich in healthy fats (i.e., olive oil, omega-3 fats)	☐	☐	☐
Health benefits of avoiding highly-processed foods	☐	☐	☐
Health benefits of avoiding added sugar	☐	☐	☐
Health benefits of eating whole (unprocessed) grains	☐	☐	☐
Health benefits of eating fish	☐	☐	☐
Health benefits of eating legumes (i.e., beans, lentils)	☐	☐	☐
Health benefits of eating nuts (in moderation)	☐	☐	☐
Health benefits of eating brightly-colored vegetables and fruits	☐	☐	☐
Connection between diet and health	☐	☐	☐

Connection between
diet and disease

☐☐☐

Other, please specify

☐☐☐

Page Break

Q13 Do you have personal experience teaching pre-licensure nursing students about how to counsel clients to make a healthy behavioral change?

- ☐ Yes
- ☐ No
- ☐ Unsure

Display This Question:

If Do you have personal experience teaching pre-licensure nursing students about how to counsel clie... = Yes

Or Do you have personal experience teaching pre-licensure nursing students about how to counsel clie... = Unsure

Q14 Considering your personal teaching experience, which of the following behavior change models **have you taught** to pre-licensure nursing students? **Select all that apply.**

- ☐ Health Belief Model
- ☐ Motivational Interviewing
- ☐ Transtheoretical Model (Stages of Change)
- ☐ Theory of Planned Behavior
- ☐ Social Cognitive Theory (Self-Efficacy)
- ☐ Other, please specify _____
- ☐ None

Display This Question:

If Do you have personal experience teaching pre-licensure nursing students about how to counsel
clie... = Yes

Or Do you have personal experience teaching pre-licensure nursing students about how to counsel
clie... = Unsure

Q18 Considering your personal teaching experience, which of the following behavior change techniques or strategies **have you taught** to pre-licensure nursing students? **Select all that apply.**

- ☐ Goal-setting
- ☐ Problem-solving
- ☐ Social support
- ☐ Self-monitoring of behavior
- ☐ Providing information about health consequences
- ☐ Feedback on behavior
- ☐ Reward for behavior
- ☐ Restructuring the physical environment
- ☐ Framing/Re-framing
- ☐ Other, please specify _____
- ☐ None

Q19 What teaching strategies have you personally used, with prelicensure nursing students, to promote learning about nutrition for health promotion? **Select all that apply.**

- ☐ I have never taught nutrition for health promotion.
- ☐ Case study
- ☐ Flipped classroom
- ☐ Gaming
- ☐ Guided clinical experience
- ☐ Independent reading
- ☐ Journal clubs
- ☐ Online module
- ☐ Peer learning
- ☐ Pre-or post-clinical conference
- ☐ PowerPoint lecture
- ☐ Simulation
- ☐ Group discussion
- ☐ Student presentation
- ☐ Other, please specify _____

☐

I don't know

End of Block: Instructional Practices

Start of Block: Demographics

Q127 This last section asks demographic questions. All answers are anonymous and not linked to respondents in any way.

Q1 Which of the following best describes the number(s) of years that you have been teaching in a baccalaureate nursing program?

☐ Less than one year

☐ 1 to 5 years

☐ 6 to 10 years

☐ 11 to 15 years

☐ More than 15 years

Q2 What is your highest educational level/degree achieved?

- ☐ Bachelors Degree
- ☐ Masters Degree
- ☐ Doctoral Degree
- ☐ Other, please specify _____

Q3 Have you ever taken a continuing education training pertaining to nutrition?

- ☐ No
 - ☐ Yes
 - ☐ I don't know
-

Q4 Which of the following best describes the type of academic institution that you work for?

- ☐ Public university
 - ☐ Private university, secular
 - ☐ Private university, religious
 - ☐ Other, please specify _____
-

Q5 Which of the following best describes the geographic location of the academic institution that you work for?

- ☐ Western United States
 - ☐ Midwest United States
 - ☐ Southern United States
 - ☐ Eastern United States
-

Q6 Which of the following best describes your job title? **Select all that apply.**

- ☐ Nursing faculty member
 - ☐ Department Chair
 - ☐ Program Director
 - ☐ Program Coordinator
 - ☐ Associate Dean
 - ☐ Dean
 - ☐ Other, please specify _____
-

Q7 Which of the following best describes your academic rank?

☐ Instructor

☐ Assistant Professor

☐ Associate Professor

☐ Professor

☐ Other, please specify _____

Q8 Which of the following best describes your area of teaching expertise? **Select all that apply.**

- ☐ Fundamentals/Foundations
 - ☐ Pharmacology
 - ☐ Nutrition
 - ☐ Medical-Surgical Nursing
 - ☐ Critical Care Nursing
 - ☐ Mental Health Nursing
 - ☐ Maternal-Child/Obstetrics
 - ☐ Pediatric Nursing
 - ☐ Community Health
 - ☐ Leadership
 - ☐ Public Health Nursing
 - ☐ Other, please specify _____
-

Q9 Which of the following best describes your gender?

- ☐ Male
 - ☐ Female
 - ☐ Non-binary / third gender
 - ☐ Prefer not to say
-

Q10 Which of the following best describes your age?

- ☐ Less than 30 years
 - ☐ Between 30 and 40 years
 - ☐ Between 40 and 50 years
 - ☐ Greater than 50 years
 - ☐ Prefer not to say
-

Q11 Are you Hispanic or Latino?

- ☐ Yes
 - ☐ No
 - ☐ Unsure
 - ☐ Prefer not to say
-

Q12 Which of the following best describes your race? **Select all that apply.**

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other, please specify _____
- ☐ Prefer not to say

End of Block: Demographics

Start of Block: End of Survey

Q107 Thank you for completing the survey. Your time is greatly appreciated! If you would like your name placed in a drawing for a \$50 dollar Amazon gift card, please access this link (LINK HERE) to provide your contact information in a survey that is separate from this one. Your name will NOT be linked in any way to your survey responses.

Thanks again!
Tracy Alberta
talberta@Oakland.edu

End of Block: End of Survey

Appendix C

General Nutrition Knowledge Questionnaire-Revised

GENERAL NUTRITION KNOWLEDGE QUESTIONNAIRE				
This is a survey, not a test. Your answers will help identify which dietary advice people find confusing. It is important that you complete it by yourself. Your answers will remain anonymous. If you don't know the answer, mark "not sure" rather than guess. Thank you for your time.				
Section 1: The first few items are about what advice you think experts are giving us.				
1. Do health experts recommend that people should be eating more, the same amount, or less of the following foods? (tick one box per food)				
	More	Same	Less	Not Sure
Fruit	☒	☐	☐	☐
Food and drinks with added sugar	☐	☐	☒	☐
Vegetables	☒	☐	☐	☐
Fatty foods	☐	☐	☒	☐
Processed red meat	☐	☐	☒	☐
Wholegrains	☒	☐	☐	☐
Salty foods	☐	☐	☒	☐
Water	☒	☐	☐	☐
2. How many servings of fruit and vegetables per day do experts advise people to eat as a minimum? (One serving could be, for example, an apple or a handful of chopped carrots) (tick one)				
2	☐			
3	☐			
4	☐			
5 or more	☒			
Not sure	☐			
3. Which of these types of fats do experts recommend that people should eat less of? (tick one box per food)				
	Eat less	Not eat less	Not sure	
Unsaturated fats	☐	☒	☐	
Trans fats	☒	☐	☐	
Saturated fats	☒	☐	☐	

4. Which type of dairy foods do experts say people should drink? (tick one)	
Full fat (e.g. full fat milk)	☐
Reduced fat (e.g. skimmed and semi-skimmed milk)	☒
Mixture of full fat and reduced fat	☐
Neither, dairy foods should be avoided	☐
Not sure	☐
5. How many times per week do experts recommend that people eat oily fish (e.g. salmon and mackerel)? (tick one)	
1-2 times per week	☒
3-4 times per week	☐
Every day	☐
Not sure	☐
6. Approximately how many alcoholic drinks is the maximum recommended per day (The exact number depends on the size and strength of the drink)? (tick one)	
1 drink each for men and women	☒
2 drinks each for men and women	☐
2 drinks for men and 1 drink for women	☐
3 drinks for men and 2 drinks for women	☐
Not sure	☐
7. How many times per week do experts recommend that people eat breakfast? (tick one)	
3 times per week	☐
4 times per week	☐
Every day	☒
Not sure	☐
8. If a person has two glasses of fruit juice in a day, how many of their daily fruit and vegetable servings would this count as? (tick one)	
None	☐
One serving	☒
Two servings	☐
Three servings	☐
Not sure	☐

9. According to the 'MyPlate' guide (a guideline showing the proportions of food types people should eat to have a balanced and healthy diet), how much of a person's diet should be made up of starchy foods? (tick one)

Quarter	☐
Third	☒
Half	☐
Not sure	☐

Section 2: Experts classify foods into groups. We are interested to see whether people are aware of food groups and the nutrients they contain.

1. Do you think these foods and drinks are typically high or low in added sugar? (tick one box per food)

	High in added sugar	Low in added sugar	Not sure
Diet cola drinks	☐	☒	☐
Plain yogurt	☐	☒	☐
Ice cream	☒	☐	☐
Tomato ketchup	☒	☐	☐
Melon	☐	☒	☐

2. Do you think these foods are typically high or low in salt? (tick one box per food)

	High in salt	Low in salt	Not Sure
Breakfast cereals	☒	☐	☐
Frozen vegetables	☐	☒	☐
Bread	☒	☐	☐
Baked beans	☒	☐	☐
Red meat	☐	☒	☐
Canned soup	☒	☐	☐

3. Do you think these foods are typically high or low in fiber? (tick one box per food)

	High in fiber	Low in fiber	Not Sure
Oats	☒	☐	☐
Bananas	☒	☐	☐
White rice	☐	☒	☐
Eggs	☐	☒	☐
Potatoes with skin	☒	☐	☐

Pasta	☐	☒	☐
-------	--------------------------	-------------------------------------	--------------------------

4. Do you think these foods are a good source of protein? (tick one box per food)			
	Good source of protein	Not a good source of protein	Not sure
Poultry	☒	☐	☐
Cheese	☒	☐	☐
Fruit	☐	☒	☐
Baked beans	☒	☐	☐
Butter	☐	☒	☐
Nuts	☒	☐	☐

5. Which of the following foods do experts count as starchy foods? (tick one box per food)				
	Starchy food	Not a starchy food	Not sure	Res
Cheese	☐	☒	☐	
Pasta	☒	☐	☐	
Potatoes	☒	☐	☐	
Nuts	☐	☒	☐	
Plantains	☒	☐	☐	

6. Which is the main type of fat present in each of these foods? (tick one box per food)					
	Polyunsaturated fat	Monounsaturated fat	Saturated fat	Cholesterol	Not sure
Olive oil	☐	☒	☐	☐	☐
Butter	☐	☐	☒	☐	☐
Sunflower oil	☒	☐	☐	☐	☐
Eggs	☐	☐	☐	☒	☐

7. Which of these foods has the most trans-fat? (tick one)	
Cookies, cakes and pastries	☒
Fish	☐
Canola oil	☐
Eggs	☐
Not sure	☐

8.	The amount of calcium in a glass of whole milk compared to a glass of skimmed milk is: (tick one)	
About the same	☒	
Much higher	☐	
Much lower	☐	
Not sure	☐	
9.	Which one of the following nutrients has the most calories for the same weight of food? (tick one)	
Sugar	☐	
Starchy	☐	
Fiber/roughage	☐	
Fat	☒	
Not sure	☐	
10.	Compared to minimally processed foods, processed foods are: (tick one)	
Higher in calories	☒	
Higher in fiber	☐	
Lower in salt	☐	
Not sure	☐	
Section 3: The next few items are about choosing foods		
1.	If a person wanted to buy a yogurt at the supermarket, which would have the least sugar/sweetener? (tick one)	
0% fat cherry yogurt	☐	
Plain yogurt	☒	
Creamy fruit yogurt	☐	
Not sure	☐	
2.	If a person wanted soup in a restaurant or cafe, which one would be the lowest fat option? (tick one)	
Mushroom risotto soup (field mushrooms, porcini mushrooms, arborio rice, butter, cream, parsley and cracked black pepper)	☐	
Carrot butternut and spice soup (carrot, butternut squash, sweet potato, cumin, red chillies, coriander seeds and lemon)	☒	
Cream of chicken soup (chicken, onions, carrots, celery, potatoes, garlic, sage, wheat flour, double cream)	☐	
Not sure	☐	

3. Which would be the healthiest and most balanced choice for a main meal in a restaurant? (tick one)	
Roast turkey, mashed potatoes and vegetables	☒
Beef, dinner roll, and roast potatoes	☐
Breaded fried fish and French fries, served with peas and tartar sauce	☐
Not sure	☐
4. Which would be the healthiest and most balanced sandwich lunch? (tick one)	
Ham sandwich + fruit + blueberry muffin + fruit juice	☐
Tuna salad sandwich + fruit + low fat yogurt + water	☒
Egg salad sandwich + chips + low fat yogurt + water	☐
Not sure	☐
5. Which of these foods would be the healthiest choice for desert? (tick one)	
Berry sorbet	☒
Apple and blackberry pie	☐
Lemon cheesecake	☐
Carrot cake with cream cheese topping	☐
Not sure	☐
6. Which of these combinations of vegetables in a salad would give the greatest variety of vitamins and antioxidants? (tick one)	
Lettuce, green peppers and cabbage	☐
Broccoli, carrot and tomatoes	☒
Red peppers, tomatoes and lettuce	☐
Not sure	☐
7. If a person wanted to reduce the amount of fat in their diet, but didn't want to give up French fries, which of the following foods would be the best choice? (tick one)	
Thick cut chips	☒
Thin cut chips	☐
Crinkle cut chips	☐
Not sure	☐

8. One healthy way to add flavour to food without adding extra fat or salt is to add: (tick one)	
Coconut milk	☐
Herbs	☒
Soy sauce	☐
Not sure	☐
9. Which of the following cooking methods requires fat to be added? (tick one)	
Grilling	☐
Steaming	☐
Baking	☐
Sautéing	☒
Not sure	☐
10. Traffic lights are often used on nutrition labelling, what would amber mean for the fat content of a food? (tick one)	
Low fat	☐
Medium fat	☒
High in fat	☐
Not sure	☐
11. "Light" foods (or Diet foods) are always good options because they are low in calories. (tick one)	
Agree	☐
Disagree	☒
Not sure	☐
The following questions are related to food labels:	

Product 1 (Sweet biscuit)		Product 2 (Savoury biscuit)	
Each biscuit (9.5g) contains:		Each biscuit (16g) contains:	
Calories 43 2%	Sugar 2g 2%	Calories 66 3%	Sugar 1g 1%
Fat 1g 2%	Saturates 1g 3%	Fat 3g 4%	Saturates Trace 1%
Salt 0.1g 2%			
Typical value (as sold) per 100g: 450 Kcal		Typical value (as sold) per 100g: 412	
Ingredient list: Oat flakes, sugar, palm oil, fortified wheat flour, whole wheat flour, fructose, malt syrup, salt, raising agents: sodium hydrogen carbonate, ammonium hydrogen carbonate, flavouring		Ingredient list: Wheat Flour, Palm Oil, Corn Syrup, Malt, Salt, Yeast, Leavening Agents (Sodium Bicarbonate, Ammonium Bicarbonate, Sodium Pyrophosphate), Corn Starch, Soy Lecithin, Sodium Metabisulphite (Baking Agent).	

12.

Looking at products 1 and 2, which one has the most calories (kcal) per 100 grams (tick one)

Product 1	☒
Product 2	☐
Both have the same quantity	☐
Not sure	☐

13.

Looking at product 1, what are the sources of sugar in the ingredient list? (tick one)

Sugar and malt syrup	☐
Sugar, fructose and lecithin	☐
Sugar, fructose and malt syrup	☒
Not sure	☐

Section 4: This section is about health problems or diseases related to diet and weight management

1.

Which of these diseases is related to a low intake of fiber? (tick one)

Bowel disorders	☒
Anemia	☐
Tooth decay	☐
Not sure	☐

2. Which of these diseases is related to how much sugar people eat? (tick one)	
High blood pressure	☐
Tooth decay	☒
Anemia	☐
Not sure	☐
3. Which of these diseases is related to how much salt (or sodium) people eat? (tick one)	
Hypothyroidism	☐
Diabetes	☐
High blood pressure	☒
Not sure	☐
4. Which of these options do experts recommend to reduce the chances of getting cancer? (tick one)	
Drinking alcohol regularly	☐
Eating less red meat	☒
Avoiding additives in food	☐
Not sure	☐
5. Which of these options do experts recommend to prevent heart disease? (tick one)	
Taking nutritional supplements	☐
Eating less oily fish	☐
Eating less trans-fats	☒
Not sure	☐
6. Which of these options do experts recommend to prevent diabetes? (tick one)	
Eating less refined foods	☒
Drinking more fruit juice	☐
Eating more processed meat	☐
Not sure	☐
7. Which one of these foods is more likely to raise people's blood cholesterol? (tick one)	
Eggs	☐
Vegetable oils	☐
Animal fat	☒
Not sure	☐

8. Which one of these foods is classified as having a high Glycemic Index (Glycemic Index is a measure of the impact of a food on blood sugar levels, thus a high Glycaemic Index means a greater rise in blood sugar after eating)? (tick one)			
Wholegrain cereals	☐		
white bread	☒		
Fruit and vegetables	☐		
Not sure	☐		
9. To maintain a healthy weight people should cut fat out completely. (tick one)			
Agree	☐		
Disagree	☒		
Not sure	☐		
10. To maintain a healthy weight people should eat a high protein diet. (tick one)			
Agree	☒		
Disagree	☐		
Not sure	☐		
11. Eating bread always causes weight gain. (tick one)			
Agree	☐		
Disagree	☒		
Not Sure	☐		
12. Fiber can decrease the chances of gaining weight. (tick one)			
Agree	☒		
Disagree	☐		
Not sure	☐		
13. Which of these options can help people to maintain a healthy weight? (answer each one)			
	Yes	No	Not sure
Not eating while watching TV	☒	☐	☐
Reading food labels	☒	☐	☐

Taking nutritional supplements	☐	☒	☐
Monitoring their eating	☒	☐	☐
Monitoring their weight	☒	☐	☐
Grazing throughout the day	☐	☒	☐

14. If someone has a Body Mass Index (BMI) of 23kg/m², what would their weight status be? (tick one)

Underweight	☐
Normal weight	☒
Overweight	☐
Obese	☐
Not sure	☐

15. If someone has a Body Mass Index (BMI) of 31kg/m², what would their weight status be? (tick one)

Underweight	☐
Normal weight	☐
Overweight	☐
Obese	☒
Not sure	☐

Look at the body shapes below:




16. Which of these body shapes increases the risk of cardiovascular disease (Cardiovascular disease is a general term that describes a disease of the heart or blood vessels, for example, angina, heart attack, heart failure, congenital heart disease and stroke)? (tick one)

Apple shape	☒
Pear shape	☐
Not sure	☐

Appendix D

Pre-Study Evaluation Questionnaire

Start of Block: Introduction

Q35

Information Sheet for Exempt Research

Pre-Study Evaluation: Nutrition for Health Promotion in Nursing Education: The Knowledge, Attitudes, Beliefs, and Practices of Nursing Faculty Introduction

You are being asked to participate in a pre-study evaluation of survey items for a research study proposed by Tracy Alberta, Ph.D. candidate, working under the direction of Dr. Julia Paul, Associate Professor in the School of Nursing at Oakland University in Southeast Michigan.

Your decision to participate in this pre-study evaluation is voluntary. You can stop your participation at any time or skip any part of the pre-study evaluation if you are uncomfortable.

Your decision will not affect your present or future relationship with Oakland University, the researcher, or the School of Nursing. If you are a student or an Oakland University employee, your participation decision will not affect your grades or employment status.

What is the purpose of this pre-study evaluation? This pre-study evaluation aims to evaluate potential survey items for sufficiency, clarity, coherence, and relevance to the measured construct(s). Who can participate in this pre-study evaluation? You are being asked to participate in the pre-study evaluation because you are a doctorally-prepared nursing faculty member with five or more years of teaching experience in undergraduate nursing programs.

What do I have to do? You will be asked to complete a survey that poses questions about survey items designed to measure the attitudes and beliefs of nursing faculty regarding teaching nutrition for health promotion. The survey will be completed online and will take approximately 30 minutes to complete.

Are there any risks to me? For this study, the potential risks are minimal. Any possible risks are related to the risks inherent in using a computer or mobile device, including, but not limited to, eye strain, muscle tension, and overuse injuries of wrists and hands. The length of this survey is not likely to cause these problems, but they can be minimized by taking frequent breaks.

The survey is anonymous. No identifiable data that can directly be linked to you are collected. If you agree to participate in this pre-study evaluation, you will be asked to complete the survey online at a time and place of your choosing.

Are there any benefits to me? There may be no direct benefits to participants. However, the results of this study may benefit others in the future. Participation in this pre-study evaluation will help to create a valid measurement tool that will aid the discovery of evidence that pre-licensure nursing programs can use to revise the curriculum, improve pedagogy, and establish competencies for teaching nutrition for health promotion. Ultimately, findings from this research may lead to a better-prepared nursing workforce to promote health and wellness.

Will I receive anything for participating? There are no financial or non-financial incentives for participating in this pre-study evaluation.

What if I want to stop participating in this study? If you want to stop participating, close your browser before completing and submitting the survey. If you wish to stop your participation after submitting the survey, please contact the researcher.

Who can I contact if I have questions about this study? If you have any questions about the research, please contact me at talberta@oakland.edu or 517-526-2045. Dr. Julia Paul, my faculty advisor, can be reached at jcpaul@oakland.edu or (248) 364-8796.

For questions regarding your rights as a participant in human subject research, you may contact the Oakland University Institutional Review Board at 248-370-4898.

☐ I agree to participate in this pre-study evaluation

Page Break

Q5

Background Information

Thank you for your time and willingness to assist me with my research. I am planning a study to measure nursing faculty's knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion. We know that diet has a powerful impact on one's health. Despite advancements in preventative health and understanding of health behaviors, diet-related chronic health problems are increasing in prevalence and contribute significantly to morbidity and mortality, as well as to decreased quality of life and a high economic burden for society. It is currently not clear if nutrition for health promotion is deliberately and systematically incorporated into prelicensure nursing education. Since nursing faculty are responsible for delivering content in the curriculum and curricular and pedagogical revision, I would like to understand if knowledge gaps, attitudes, or beliefs prevent nursing faculty from instructing students about nutrition for health promotion.

Some of the items on my survey tool are novel. This questionnaire aims to evaluate potential survey items for sufficiency, clarity, coherence, and relevance to the construct(s) being measured.

End of Block: Introduction

Start of Block: Attitude Items

Q1

Attitudes of Nursing Faculty Toward Teaching Nutrition for Health Promotion

I am interested in measuring the attitudes of nursing faculty toward teaching nutrition for health promotion. The definition of attitudes for this study is derived from the theory of planned behavior, which conceptualizes an attitude as the degree to which a person has a favorable or unfavorable appraisal of the behavior in question. One's attitude toward a behavior is based on the perception of the effect or outcome of the behavior. In other words, a positive attitude toward a behavior arises from the perception that the behavior will have a favorable outcome. For my study, the definition of attitudes is an *appraisal of the effect of nursing faculty teaching nutrition for health promotion, characterized on a continuum from positive to negative*.

As an expert nurse educator, I'd like your evaluation of the survey items themselves. Please consider the items in the context of the definition above.

Page Break

Q1 Definitions

1. **Nutrition for health promotion:** A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease; Also, avoiding foods or food-like substances that are known to contribute to poor health
 2. **Teaching nutrition for health promotion:** The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners
 3. **Attitudes:** An appraisal of the effect of nursing faculty teaching nutrition for health promotion, characterized on a continuum from positive to negative.
-

Q16 Attitude Items

Q3 1. Is it important to incorporate nutrition for health promotion concepts into prelicensure nursing courses?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q7 2. Do nurses have a professional obligation to provide counseling about nutrition for health promotion?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q8 3. Does health-promoting nutritional guidance provided by nurses increase patients' motivation to eat a healthy diet?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q9 4. Does counseling a patient about eating a health-promoting diet compromise the nurse-patient relationship?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q10 5. How much impact does health-promoting nutritional guidance, provided by nurses, have on patients' motivation to eat a healthy diet?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q11 6. Does teaching prelicensure nursing students about nutrition for health promotion improve nursing care?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q12 7. Does teaching pre-licensure nursing students about nutrition for health promotion improve patient outcomes?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q13 8. Does nutrition for health promotion belong in prelicensure nursing curricula?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q14 9. Do nursing faculty have a professional obligation to teach nutrition for health promotion to prelicensure nursing students?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of <i>attitude</i> being used for this study?	☐	☐	☐	☐	☐
Considering the definition, is this item important to measure?	☐	☐	☐	☐	☐

Q32 Are the items sufficient to measure attitudes in the context of the definition? Add comments as needed to further elaborate your answer.

- ☐ The items are sufficient to measure attitudes.

- ☐ The items measure some aspects of attitude, but do not fully represent the construct of attitude. _____
- ☐ A few items must be added in order to fully measure the construct of attitude.

- ☐ The items are insufficient to measure attitudes.

End of Block: Attitude Items

Start of Block: Beliefs

Q17

Beliefs of Nursing Faculty about Teaching Nutrition for Health Promotion

I am interested in measuring the beliefs of nursing faculty toward teaching nutrition for health promotion. The definition of beliefs for this study is derived from the theory of planned behavior. The theory of planned behavior describes three types of beliefs that influence one's behavior, namely, normative beliefs (subjective norm), internal and external control beliefs (perceived behavioral control), and behavioral beliefs (attitude). For my study, the definition of beliefs is *perceptions about teaching nutrition for health promotion that nursing faculty accept as true; including internal factors (perceived ability, confidence), external factors (time, resources), and social expectations*. As an expert nurse educator, I'd like your evaluation of the survey items themselves. Please consider the items in the context of the definition above.

Q18 Definitions

1. **Nutrition for health promotion:** A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease; Also, avoiding foods or food-like substances that are known to contribute to poor health

2. **Teaching nutrition for health promotion:** The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners

3. **Beliefs:** Perceptions about teaching nutrition for health promotion that nursing faculty accept as true; including internal factors (perceived ability, confidence), external factors (time, resources), and social expectations.

a. **Control Beliefs :** Perceptions about factors that may enhance or hinder one's willingness to undertake a behavior. These are internal factors (perceived ability, confidence) or external (time, resources).

b. **Normative Beliefs:** Perceptions about social expectations to perform (or not perform) a behavior.

Q19 Control Belief Items

Q20 1. Do you have enough time, in the courses that you teach to prelicensure nursing students, to include nutrition for health promotion?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

**Q21 2. Do you have the necessary resources to teach nutrition for health promotion?
(Examples include, but are not limited to, reference materials, pre-made instructor resources, standard curriculum, etc.)**

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q22 3. How comfortable do you feel discussing nutrition for health promotion with your prelicensure nursing students?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q23 4. Do you have the necessary knowledge to teach nutrition for health promotion to prelicensure nursing students?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q24 5. Are you confident that you could teach nutrition for health promotion to prelicensure nursing students?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q25 6. Would you enjoy teaching nutrition for health promotion to prelicensure nursing students?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of control beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Page Break

Q28 Definitions

1. **Nutrition for health promotion:** A pattern of eating that provides balanced energy (calories) and optimizes the intake of micro and macronutrients known to support physical and mental health and prevent disease; Also, avoiding foods or food-like substances that are known to contribute to poor health

2. **Teaching nutrition for health promotion:** The act of instruction in which the knowledge and skills needed to provide health-promoting nutritional guidance are imparted to learners

3. **Beliefs:** Perceptions about teaching nutrition for health promotion that nursing faculty accept as true; including internal factors (perceived ability, confidence), external factors (time, resources), and social expectations.

a. **Control Beliefs :** Perceptions about factors that may enhance or hinder one's willingness to undertake a behavior. These are internal factors (perceived ability, confidence) or external (time, resources).

b. **Normative Beliefs:** Perceptions about social expectations to perform (or not perform) a behavior.

Q26 Normative Belief Items

Q27 1. Do your nursing faculty colleagues think nutrition for health promotion concepts should be incorporated into prelicensure nursing curricula?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of normative beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q29 2. Do your program administrators (i.e. deans, directors) think nutrition for health promotion concepts should be incorporated into prelicensure nursing curricula?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of normative beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q30 3. Do students enrolled in your prelicensure nursing program think nutrition for health promotion concepts should be incorporated into prelicensure nursing curricula?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of normative beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q31 4. Do accreditors think nutrition for health promotion concepts should be incorporated into prelicensure nursing curricula?

	Definitely not	Probably not	Neither yes or no	Probably yes	Definitely yes
Do you easily understand what this item is asking?	☐	☐	☐	☐	☐
Does this item relate to the definition of normative beliefs?	☐	☐	☐	☐	☐
Considering the definition of beliefs, is this item important to measure?	☐	☐	☐	☐	☐

Q33 Are the items (in totality) sufficient to measure beliefs in the context of the definition? Add comments as needed to further elaborate your answer.

- ☐ The items are sufficient to measure beliefs.

- ☐ The items measure some aspects of attitude, but do not fully represent the construct of beliefs. _____
- ☐ A few items must be added in order to fully measure the construct of beliefs.

- ☐ The items are insufficient to measure beliefs.

Q34 The End. Thank you again for your time!

Appendix E

Initial Email to Nursing Program Administrators



Subject: Action Requested: Research Participation Opportunity, Please Forward to Nursing Faculty

Dear Nursing Program Administrator,

Hello! I am Tracy Alberta, Ph.D. candidate, working under the direction of Dr. Julia Paul, Assistant Professor in the School of Nursing at Oakland University in southeast Michigan. For my dissertation, I am conducting a research study to describe nursing faculty knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion.

I am recruiting full-time nursing faculty in prelicensure baccalaureate programs to complete an online survey. **Completion of the survey will take approximately 30 minutes.**

I request your help and ask that you **forward this email, with the attached recruitment letter and survey link, to the full-time nursing faculty at your institution.** Your assistance is greatly appreciated and will contribute toward improving the nursing workforce's capacity to promote health through diet.

This study has been approved by the Institutional Research Board at Oakland University for exempt status.

If you have any questions about the research, please contact me at talberta@oakland.edu or 517-526-2045. Dr. Julia Paul can be reached at jcpaul@oakland.edu.

SURVEY LINK

Appendix F

Recruitment Letter



Hello! I am Tracy Alberta, a PhD candidate, working under the direction of Dr. Julia Paul, Assistant Professor in the School of Nursing at Oakland University. I am conducting a research study, the purpose of which is to describe nursing faculty knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion.

The nursing profession can do more to promote health through diet and stem the tide of diet-related chronic health conditions. However, it is not known if nutrition for health promotion is systematically incorporated into pre-licensure nursing education. **Your participation in this research will help to develop a foundation of information which pre-licensure nursing programs can use to revise curriculum, improve pedagogy, and establish competencies for teaching nutrition for health promotion.**

I am recruiting individuals who are full-time nursing faculty in prelicensure, baccalaureate programs, who have at least one year of didactic (classroom) experience teaching nursing courses to complete an online survey regarding their knowledge, attitudes, beliefs and current instructional practices regarding teaching nutrition for health promotion.

Completion of the survey will take approximately 30 minutes.

Your participation in this study is voluntary and you may withdraw from participation at any time. **If you choose to finish the survey, you will have the opportunity to be entered into a drawing to win one of four Amazon gift cards, each valued at \$50.**

If you have any questions about the research, please contact me at talberta@oakland.edu or 517-526-2045. Dr. Julia Paul can be reached at jcpaul@oakland.edu.

If you agree to participate in the study, access the survey link below at anytime to begin.

SURVEY LINK

Thank you very much for your help!

Tracy Alberta, MSN, RN
PhD Candidate, Oakland University

Appendix G

Oakland University Institutional Review Board Approval Letters



Institutional Review Board

Date: September 15, 2023

Study #: IRB-FY2023-342

Study Title: Nutrition for Health promotion in Nursing Education: The Knowledge, Attitudes, Beliefs and Instructional Practices of Nursing Faculty

Submission Type: Initial

IRB Decision: Exempt

Research Team:

Tracy Alberta

Julia Paul

Based on applicable federal regulations, the above referenced study has been determined to be Exempt, with the following categories:

Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

Letter and Consent Document:

This letter along with the two IRB approved (date-stamped) consent documents can be found in Cayuse in the [Submission Details](#) page under [Letters](#) and [Attachments](#), respectively. Please make sure to use the most recent IRB approved version of the consent forms in consenting participants.

Appendix G Continued



Institutional Review Board

Date: November 1, 2023

Study #: IRB-FY2023-342

Study Title: Nutrition for Health promotion in Nursing Education: The Knowledge, Attitudes, Beliefs and Instructional Practices of Nursing Faculty

Submission Type: Modification

IRB Decision: Exempt

Research Team:

Tracy Alberta

Julia Paul

Julia Paul, Kyle Moxley

The IRB has reviewed the Modification submission related to the above referenced study and determined that the changes listed below do not affect the exemption status of the study. The Modification submission is Approved and the study remains Exempt per federal regulations.

The approved modifications are the following:

Minor revisions to improve clarity and validity of the following sections of the Main Study questionnaire:

- Nutrition for Health Promotion-Nursing Faculty Attitudes and Beliefs
- Nutrition for Health Promotion-Nursing Faculty Instructional Practices

This submission include the following approved documents:

- Updated versions of the above sections as well as updated entire Main Study questionnaire.

You are approved to implement the aforementioned modifications. Please retain a copy of this notification for your records.

This letter can also be found in Cayuse under the [Letters](#) tab in the [Submission Details](#) page.

If you have any questions, please contact the IRB office.

Appendix G Continued



Institutional Review Board

Date: January 8, 2024

Study #: IRB-FY2023-342

Study Title: Nutrition for Health promotion in Nursing Education: The Knowledge, Attitudes, Beliefs and Instructional Practices of Nursing Faculty

Submission Type: Modification

IRB Decision: Exempt

Research Team:

Tracy Alberta

Julia Paul

Julia Paul, Kyle Moxley

The IRB has reviewed the Modification submission related to the above referenced study and determined that the changes listed below do not affect the exemption status of the study. The Modification submission is Approved and the study remains Exempt per federal regulations.

The approved modifications are the following:

- Minor revisions to the third recruitment email in hopes of inspiring more survey responses.

You are approved to implement the aforementioned modifications. Please retain a copy of this notification for your records.

This letter can also be found in Cayuse under the Letters tab in the Submission Details page.

Appendix H

Information Sheet for Exempt Survey Research

Nutrition for Health Promotion in Nursing Education: The Knowledge, Attitudes, Beliefs, and Practices of Nursing Faculty

Introduction

You are being asked to be in a research study that is being done by Tracy Alberta, Ph.D. candidate, working under the direction of Dr. Julia Paul, Associate Professor in the School of Nursing at Oakland University in southeast Michigan.

Your decision to participate in this study is voluntary. You can stop your participation at any time or skip any part of the study if you are uncomfortable. Your decision will not affect your present or future relationship with Oakland University, the researcher, or the *School of Nursing*.

If you are a student or an Oakland University employee, your participation decision will not affect your grades or employment status.

What is the purpose of this study?

This research study aims to describe nursing faculty knowledge, attitudes, beliefs, and instructional practices regarding teaching nutrition for health promotion.

Who can participate in this study?

You are being asked to participate in the study because you are a full-time nursing faculty member in a prelicensure baccalaureate program.

What do I have to do?

You will be asked to complete a survey about your knowledge, attitudes, beliefs, and current instructional practices regarding teaching nutrition for health promotion. The survey will be done online and will take approximately 30 minutes to complete.

Are there any risks to me?

For this study, the potential risks are minimal. Any possible risks are related to the risks inherent in using a computer or mobile device, including, but not limited to, eye strain, muscle tension, and overuse injuries of wrists and hands. The length of this survey is not likely to cause these problems, but they can be minimized by taking frequent breaks.

The survey is anonymous. No identifiable data that can directly be linked to you are collected.

If you agree to participate in this research study, you will be asked to complete the survey online at a time and place of your choosing. After completing the survey, you will be redirected to an optional SECOND, SEPARATE survey. This survey will ask for your name and email address. Your contact information will be used for a drawing to receive

one of four Amazon gift cards valued at \$50. This information will not be linked to your data in any way.

Appendix H Continued

Are there any benefits to me?

There may be no direct benefits to participants. However, the results of this study may benefit others in the future. Participation in this research will help to create a foundation of information that pre-licensure nursing programs can use to revise the curriculum, improve pedagogy, and establish competencies for teaching nutrition for health promotion. Ultimately, findings from this research may lead to a better-prepared nursing workforce to promote health and wellness.

Will I receive anything for participating?

Once you complete the survey, you can access a second, separate survey (optional) that will ask for your name and email address. This information will be used for entry into a raffle to win one of four Amazon gift cards valued at fifty dollars. Once data collection is complete, four names will be randomly selected via Qualtrics, which allows the raffle winners' names to remain inaccessible to the researcher. Again, the names and addresses collected via this secondary survey will NOT be linked to any data.

What if I want to stop participating in this study?

If you want to stop participating, close your browser before completing and submitting the survey. If you wish to stop your participation after submitting the survey, please contact the researcher.

Who can I contact if I have questions about this study?

If you have any questions about the research, please contact me at talberta@oakland.edu or 517-526-2045. Dr. Julia Paul, my faculty advisor, can be reached at jcpaul@oakland.edu or (248) 364-8796.

For questions regarding your rights as a participant in human subject research, you may contact the Oakland University Institutional Review Board at 248-370-4898.

References

- Accreditation Commission for Education in Nursing (ACEN). (2017). *The ACEN accreditation manual*. ACEN. <https://www.acenursing.org/acen-accreditation-manual/>
- Adams, C., Gringart, E. & Strobel, N. (2022). Explaining adults' mental health help-seeking through the lens of the theory of planned behavior: A scoping review. *BMC*, 11(160), 1-16. <https://doi.org/10.1186/s13643-022-02034-y>
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.) *Action Control. SSP Springer Series in Social Psychology*. Springer
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27-58.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Akhter, Z., Malik, G., & Plummer, V. (2021). Nurse educator knowledge, attitude, and skills towards using high-fidelity simulation: A study in the vocational education sector. *Nurse Education in Practice*, 53, 1-8. <https://doi.org/10.1016/j.nepr.2021.103048>
- Alkerwi, A. (2014). Diet quality concept. *Nutrition*, 30, 613-618.

- Al-Shwaiyat, N., Sinjillawi, A., Al-Rethaiaa, A., Fahmy, A., Al-Saraireh, A. Agel, M., Alhajjaj, S., & Al-Sbou, A. (2013). Assessment of therapeutic nutritional knowledge of Jordanian Nurses. *International Journal of Nutrition and Food Sciences*, 2(3), 142-148. <https://doi.org/10.11648/J.IJNFS.20130203.18>
- American Association of Colleges of Nursing (2013). *Competencies and curricular expectations for clinical nurse leader education and practice*.
<https://tinyurl.com/27jt6jrk>
- American Association of Colleges of Nursing. (2018). *Baccalaureate education*.
<https://www.aacnnursing.org/Nursing-Education-Programs/Baccalaureate-Education#:~:text=Currently%2C%20there%20are%20more%20than,a%20baccalaureate%20degree%20was%20363%2C433>.
- American Association of Colleges of Nursing. (2019). *AACN's vision for academic nursing*. <https://tinyurl.com/5n7jedxr>
- American Association of Colleges of Nursing. (2021). *The essentials: Core competencies for professional nursing education*.
<https://www.aacnnursing.org/AACN-Essentials>
- American Association of Colleges of Nursing. (2022). *Reimagining nursing education: 2022 annual report*. <https://www.aacnnursing.org/Portals/42/Publications/Annual-Reports/2022-AACN-Annual-Report.pdf>
- American Association of Colleges of Nursing. (2023). *Essentials: Competency Assessment Framework*.
<https://www.aacnnursing.org/Portals/0/PDFs/Essentials/AACN-Essentials->

- American Association of Colleges of Nursing. (2024a). *2023-2024 Salaries of instructional and administrative nursing faculty in baccalaureate and graduate programs in nursing*. American Association of Colleges of Nursing
- American Association of Colleges of Nursing. (2024b). End-of-life nursing education consortium (ELNEC). <https://www.aacnnursing.org/el nec>
- American Nurses Association. (2021). *Nursing: Scope and standards of practice*, 4th ed. ANA
- Arifin, N., Fuad, E., & Muhson, A. (2021). Innovative behavior in religious-based theory of planned behavior perspective. *Journal of Human Resource Management*, 20(1), e1-e11. <https://doi.org/10.41-2/sajhrm.v2-i0.1809>
- Azami, G., Lam-Soh, K., Sazlina, S. Salmiah, M., Aazami, S., Mozafari, M., & Taghinejad, H. (2018). Effect of a nurse-led diabetes self-management education program on glycosylated hemoglobin among adults with type-2 diabetes. *Journal of Diabetes Research*, 1-12. <https://doi.org/10.1155/2018/4930157>
- Bakre, A., Akodu, A., & Akodu, B. (2012). Examining the nutritional knowledge of nurses: A theoretical perspective. *Journal of Public Health and Epidemiology*, 3(4), 105-109. <https://doi.org/10.5897/JPHE11.211>
- Barr, O. & le May, A. (2012). Pre-registration nurse education: Building the foundation of a nursing career and profession? *Journal of Research in Nursing*, 17(4), 309-311. <https://doi.org/10.1177/1744987112454777>
- Bauer, S., Halfens, R., & Lohrmann, C. (2015). Knowledge and attitudes of nursing staff

- towards malnutrition care in nursing homes: A multicenter cross-sectional study. *Journal of Nutrition in Healthy Aging*, 19(7), 734-740. <https://doi.org/10.1007/s12603-015-0535-7>
- Billings, D. M., & Halstead, J. A. (Eds.) (2020). *Teaching in nursing: A guide for faculty* (6th ed.) Elsevier
- Boaz, M., Rychani, L., Barami, K., Hour, Z., Yosef, R., Siag, A., Berlovitz, Y. & Leibovitz, E. (2013). Nurses and nutrition: A survey of knowledge and attitudes regarding nutrition assessment and care of hospitalized elderly patients. *The Journal of Continuing Education in Nursing*, 44(8), 357-364. <https://doi.org/10.3928/00220124-20130603-89>
- Boston University. (2022). *Theory of planned behavior*. <https://tinyurl.com/36x9rsty>
- Buxton, C. & Davies, A. (2013). Nutritional knowledge levels of nursing students in a Tertiary institution: Lessons for curriculum planning. *Nursing Education in Practice*. 13(5), 355-360. <https://doi.org/10.1016/j.nepr.2012.09.014>
- Carrington, M. & Zimmet, P. (2017). Nurse coordinated health and lifestyle modification for reducing multiple cardio-metabolic risk factors in regional adults: outcomes from the MODERN randomized controlled trial. *European Journal of Cardiovascular Nursing*, 21, 26-35. <https://doi.org/10.1093/eurjcn/zvab042>
- Centers for Disease Control and Prevention. (2021, February). *Adult obesity facts*. U.S. Department of Health and Human Services. <https://www.cdc.gov/obesity/data/adult.html>
- Centers for Disease Control and Prevention. (2020, August). *National diabetes statistics*

- report, 2020. U.S. Department of Health and Human Services.
<https://www.cdc.gov/diabetes/data/statistics-report/index.html>
- Chakrabarty, K., & Chakrabarty, A. (2019). *Textbook of nutrition in health and disease*. Springer
- Champely, S. (2020). *_pwr: Basic Functions for Power Analysis_*. R package version 1.3-0, <<https://CRAN.R-project.org/package=pwr>>.
- Chao, A., Luong, V., Dowd, M., & Compher, C. (2020). A national survey of faculty perceptions of nutrition in nursing education. *Journal of Nursing Education*, 59(10), 566-569. <https://doi.org/10.3928/01484834-20200921-05>
- Chao, A., Zhou, Y., Wei, X., Wisdom-Goulbourne, T., Dowd, M., & Compher, C. (2021). Nutrition education in primary care adult and family nurse practitioner programs. *Nurse Educator*, 47(1), 47-50. <https://doi.org/10.1087/NNE.0000000000001050>
- Chepulis, L. & Mearns, G. (2015). Evaluation of the nutritional knowledge of undergraduate nursing students. *Journal of Nursing Education*, 54(9), 103-106. <https://doi.org/10.3928/01484834-20150814-19>
- Commission on Collegiate Nursing Education (CCNE). (2024). Standards for accreditation of baccalaureate and graduate nursing programs. *American Association of Colleges of Nursing*. <https://www.aacnnursing.org/ccne-accreditation/accreditation-resources/standards-procedures-guidelines>
- Coppell, K., Abel, S. Freer, T., Gray, A., Sharp, K., Norton, J., Spedding, T., Ward, L., & Whitehead, L. (2017). The effectiveness of a primary care nursing-led dietary intervention for prediabetes: A mixed methods pilot study. *BMC Family*

Practice, 106(18), 1-13. <https://doi.org/10.1186/s12875-017-0671-8>

Crogan, N., Shultz, J., & Massey, L. (2001). Nutrition knowledge of nurses in long-term care facilities. *The Journal of Continuing Education in Nursing*, 32(4), 171-176

Dernini, S. & Berry, E. (2016). Historical and behavioral perspectives of the Mediterranean diet. In D. Romagnolo & O. Selmin (Eds.), *Mediterranean Diet: Dietary Guidelines and Impact on Health and Disease*, (pp. 29-41). Humana Press.

Diabetes Prevention Program Research Group. (2015). Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications over 15-year follow-up: The Diabetes Prevention Program Outcomes Study (DPPOS). *Lancet Diabetes Endocrinology*, 3(11), 866-875. [https://doi.org/10.1016/S2213-8587\(15\)00291-0](https://doi.org/10.1016/S2213-8587(15)00291-0)

Dillman, D., Smyth, J., & Christian, L. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley

DiMaria-Ghalili, R., Mirtallo, J., Tobin, B., Hark, L., Van horn, L., & Palmer, C. (2014). Challenges and opportunities for nutrition education and training in the health care professions: Intraprofessional and interprofessional call to action. *American Journal of Clinical Nutrition*, 99(5), 1184-1193. <https://doi.org/10.3945/ajcn.113.073536>

DiMaria-Ghalili, R., Gilbert, K., Lord, L., Neal, T., Richardson, D., Tyler, R., & Guenter, P. (2016). Standards of nutrition care practice and professional performance for nutrition support and generalist nurses. *Journal of Nutrition in Clinical Practice*,

31(4), 527-547. <https://doi.org/10.1177/0884533616653835>

- Dorce, L., da Silva, M., Mauad, J., deFaria, D., Carla, H., & Borges, J. (2021). Extending the theory of planned behavior to understand consumer purchase behavior for organic vegetables in Brazil: The role of perceived health benefits, perceived sustainability benefits, and perceived price. *Food Quality and Preference*, 91, Article 10419. <https://doi.org/10.1016/j.foodqual.2021.104191>
- Engleer, D., Halfens, R., Schussler, S., Visser, M., Volkert, D., & Lohrmann, C. (2018). Is the topic of malnutrition in older adults addressed in the European nursing curricula? A MaNuEL study. *Nurse Education Today*, 68, 13-18. <https://doi.org/10.1016/j.nedt.2018.05.015>
- Endevelt, R., Werner, P., Goldman, D., & Karpati, T. (2009). Nurses' knowledge and attitudes regarding nutrition in the elderly. *The Journal of Nutrition, Health & Aging*, 13(6), 485-489. <https://doi.org/10.1007/s12603-009-0098-6>
- Englert, D., Crocker, K., & Stotts, N. (1986). Nutrition education in schools of nursing in the United States, part 1: The evolution of nutrition education in schools of nursing. *Journal of Parenteral and Enteral Nutrition*, 10(5), 522-527.
- Ernest, P. (1989). The knowledge, beliefs, and attitudes of the mathematics teacher: A model. *Journal of Education for Teaching*, 15(1), 13-33.
- Estruch R., Emilio, R., Salas-Salvado, J., Covas, M., Corella, D., Aros, F., Gomez-Gracia, E., Ruiz-Gutiérrez, V., Fiol, M., Lapetra, J., Lamuela-Raventós, R., Serra-Majem, L., Pinto, X., Basora, J., Muñoz, M., Sorlí, J., Martínez, J., & Martínez-González, M. (2013). Primary prevention of cardiovascular disease with a

- Mediterranean diet. *New England Journal of Medicine*, 368(14), 1279-1290.
<https://doi/10.1056/NEJMoa1200303>
- Fishbein, M. & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press
- French, D., Sutton, S., Hennings, S., Mitchell, J., Wareham, N., Griffin, S., Hardeman, W., & Kinmonth, A. (2005). The importance of affective beliefs and attitudes in the theory of planned behavior: Predicting intention to increase physical activity. *Journal of Applied Social Psychology*, 35(9), 1824-1848.
- Garret, B.M. (2012). Changing the game: Some thoughts on future healthcare demands, technology, nursing, and interprofessional education. *Nurse Education in Practice*, 12(4), 179-181. <https://doi.org/10.1016/j.nepr.2012.03.006>
- Giddens, J. & Brady, D. (2007). Rescuing nursing education from content saturation: The case for a concept-based curriculum. *Journal of Nursing Education*, 46(2), 65-69. <https://doi.org/10.3928/01484834-20070201-05>.
- Grant, C. & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your "house." *Administrative Issues Journal: Connecting Education, Practice and Research*, 4(2), 1-26. <https://doi.org/10.5929/2014.4.2.9>
- Gropper, S., Smith, J., & Carr, T. (2022). *Advanced nutrition and human metabolism* (8th ed.). Cengage
- Hakonsen, S., Bjerrum, M., Bygholm, A., Jjelgaard, H., & Pedersen, P. (2018). The routines, knowledge, and attitudes towards nutrition and documentation of

- nursing staff in primary healthcare: A cross-sectional study. *Journal of Community & Public Health Nursing*, 4(3), 1000220.
<https://doi.org/10.4172/2471-9846.1000220>
- Harkin, N., Mathews, T., Schwartzbard, Berger, J., & Gianos, E. (2018). Physicians' dietary knowledge, attitudes, and counseling practices: The experience of a single health care center at changing the landscape for dietary education. *American Journal of Lifestyle Medicine*, 13(3), 292-300.
<https://doi.org/10.1177/1559827618809934>
- Henderson-Sabry, J., Hedley, M., & Kirstine, M. (1987). Nutrition applications in public health nursing: A survey of needs and preferences of public health nurses for continuing education in nursing. *Canadian Journal of Public Health*, 78(1), 51-56.
- Horizon Research (2000). *Local systemic change: 1999-2000 core evaluation data Collection manual*. Horizon Research, Inc.
- Hutchins, K. (2009). *Examining college science teachers' belief systems about inquiry-based teaching in the context of a professional development program* [Doctoral dissertation, University of Missouri]. ProQuest Dissertations and Theses Global
- Hutchins, K. & Friedrichsen, P. (2012). Science faculty belief systems in a professional development program: Inquiry in college laboratories. *Journal of Science Teacher Education*, 23(8), 867-887. <https://doi.org/10.1007/s10972-012-9294-z>
- Iarossi, G. (2006). *The power of survey design: A user's guide for managing surveys, interpreting results, and influencing respondents*. The World Bank

- Ilmonen, J., Isolauri, E., & Laitinen, K. (2012). Nutrition education and counseling practices in mother and child health clinics: Study amongst nurses. *Journal of Clinical Nursing*, 21(19pt20), 2985-2994. <https://doi.org/10.1111/j.1365-2702.2012.04232.x>
- Kable, A., James, C., Snodgrass, S., Plotnikoff, R., Guest, m., Ashby, S., Olmeadow, C. & Collins, C. (2015). Nurse provision of healthy lifestyle advice to people who are overweight or obese. *Nursing and Health Sciences* 17(4), 451-459. <https://doi.org/10.1111/nhs.12214>
- Kim, H. & Choue, R. (2009). Nurses' positive attitudes to nutritional management but limited knowledge of nutritional assessment in Korea. *International Nursing Review* 56(3), 333-339.
- Kim, M. & Mallory, C. (2017). *Statistics for evidence-based practice in nursing* (2nd ed.). Jones & Bartlett
- Kliemann, N., Wardle, F., Johnson, F, & Croker, H. (2016). Reliability and validity of a revised version of the General Nutrition Knowledge Questionnaire. *European Journal of Clinical Nutrition*, 70(10), 1174-1180. <https://doi.org/10.1038/ejcn.2016.87>
- Kobe, J. (2006). Aspects of nutritional knowledge, attitudes and practices of nurses working in the surgical division at the Kenyatta National Hospital, Kenya. [Masters thesis. Department of Human Nutrition of the University of Stellenbasch].
- Kris-Etherton, P., Akabas, S., Bales, C., Bistran, B., Braun, L., Edwards, M., Laur, C.,

- Lenders, C., Levy, M., Palmer, C., Pratt, C., Ray, S., Rock, C., Saltzman, E., Seidner, D., & VanHorn, L. (2014). The need to advance nutrition education in the training of health care professionals and recommended research to evaluate implementation and effectiveness. *American Journal of Clinical Nutrition* 99(5), 1153-1166.
- Laing, B. & Crowley, J. (2021). Is undergraduate nutrition education sufficient for patients' nutrition care in today's pandemics? Assessing the nutrition knowledge of nursing students, an integrative review. *Nurse Education in Practice*, 54, e103137. <https://doi.org/10.1016/j.nepr.2021.103137>
- Lane, M., Davis, J., Beattie, S., Gomez-Donoso, C., Loughman, A., O'Neil, A., Jacka, F., Berk, M., Page, R., Marz, W., & Rocks, T. (2022). Ultra-processed food and chronic noncommunicable diseases: A systematic review and meta-analysis of 43 observational studies. *Obesity Review*, 22(3), Article e13146. <https://doi.org/10.1111/obr.13146>.
- Lareyre, O., Gourlan, M., Stoebe-Delbarre, A., & Cousson-Gelie, F. (2021). Characteristics and impact of theory of planned behavior interventions on smoking behavior: A systematic review of the literature. *Preventive Medicine*, 143, 106327-106327. <https://doi.org/10.1016/j.ypmed.2020.106327>
- Leighton, R. & Griffioen, D. (2021). Lecturers' curational behavior in higher education. *Teaching in Higher Education*, 28(6), 1207-1226. <https://doi.org/1.1080/13562517.2021.1872530>
- Lepage, M., Dumas, L., & Saint-Pierre, C. (2015). Teaching smoking cessation to future

- nurses: Quebec educators' beliefs. *Western Journal of Nursing Research*, 37(3), 376-393. <https://doi.org/10.1177/0193945913510629>
- Lessem, A., Martin, S., Evans, J. , & Dunemn, K. (2020). A whole-food plant-based experiential education program for healthcare providers results in personal and professional changes. *Journal of the American Association of Nurse Practitioners*, 32(12), 788-794. <https://doi.org/10.1097/JXX.0000000000000305>
- Lindseth, G. (1989). *An evaluative analysis of preventive nutrition in nursing curricula* [unpublished doctoral dissertation], Saint Louis University.
- Lindseth G. (1990). Evaluating rural nurses for preparation in implementing nutrition interventions. *Journal of Rural Health*, 6(3), 231-245. doi: 10.1111/j.1748-0361.1990.tb00664.x.
- Lindseth G. (1994). Nutrition preparation and the geriatric nurse. *Western Journal of Nursing Research*, 16(6): 692-703
- Lindseth, G. (1997). Factors affecting graduating nurses' nutritional knowledge: Implications for continuing education. *The Journal of Continuing Education in Nursing*, 28(6), pp. 245-251.
- Livne, N. (2019). Need for nutrition education in health professional programs: A review of the literature. *Internet Journal of Allied Health Sciences and Practice*, 17(1), 1540-1580. <https://doi.org/nsuworks.nova.edu/ijahsp/vol17iss1/5>.
- Lucas, C., McMahon, A., Charlton, K. (2019). Developing professional education for primary healthcare providers about nutrition. *Australian Journal of Primary Health*, 25, 534-538. <https://doi.org/10.1070/PY19075>

- Lyon, L. & Houser, R. (2018). Nurse educator attitudes toward people with disabilities. *Nurse Education Perspectives*, 39(3).
<https://doi.org/10.1097/01.NEP.0000000000000282>
- Lyu, Y., Chen, G., Shen, L., Liu, Y., Gao, F., He, X., & Crilly, J. (2021). Knowledge, attitudes, clinical practice and perceived barrier with nutrition support among physicians and nurses in the emergency department: A national cross-sectional survey. *International Emergency Nursing*, 55, 100973.
<https://doi.org/10.1016/j.ienj.2021.100973>
- Mancin, S., Sguanci, M., Cattani, D., Soekeland, F., Axiak, G., Mazzoleni, B., De Marinis, M., & Piredda, M. (2023). Nutritional knowledge of nursing students: A systematic literature review. *Nurse Education Today*, 126.
<https://doi.org/10.1016/j.nedt.2023.105826>
- Manitz, J., Hempelmann, M., Kauermann, G., Kuechenhoff, H., Shao, S., Oberhauser, C., Westerheide, N., & Wiesenfarth, M. (2021). *_samplingbook: Survey Sampling Procedures_*. R package version 1.2.4, <<https://CRAN.R-project.org/package=samplingbook>>.
- Martin, L., Leveritt, M., Desbrow, B. & Ball, L. (2013). The self-perceived knowledge, skills, and attitudes of Australian practice nurses in providing nutrition care to patients with chronic disease. *Family Practice*, 31(2), 201-208.
<https://doi.org/10.1093/fampra/cmt070>
- McCormick, K. & Salcedo, J. (2017). *SPSS statistics for data analysis and visualization*.

Wiley

McDermott, M., Oliver, M., Simnadis, T., Beck, E., Coltman, T., Iverson, D., Caputi, P., & Sharma, R. (2015). The theory of planned behavior and dietary patterns: A systematic review and meta-analysis. *Preventive Medicine, 81*, 150-156.

<https://doi.org/10.1016/j.ypmed.2015.08.020>

Mekhoa, T., Mooi, N., & Baloyi, O. (2022). Knowledge, attitudes, and practices of nurses regarding maternal nutrition in pregnant women at a large hospital and filter clinics, Lesotho. *Health SA Gesondheid, 27*(0), a1768.

<https://doi.org/10.4102/hsag.v27i0.1768>

Mertler, C. & Reinhart, R. (2017). *Advanced and multivariate statistical methods*, 6th ed. Routledge

Mitchell, H., Lucas, C., Charlton, K., & McMahon, A. (2018). Models of nutrition-focused continuing education programs for nurses: A systematic review of the evidence. *Australian Journal of Primary Health, 24*, 101-108. 11

<https://doi.org/10.1071/PY17088>

Naser, I., Ellulu, M., Tabash, M., Najim, A., & Tair, A. (2021). Nutrition knowledge, attitude and practice of nurses and physicians of Palestinian hospitals in the Gaza Strip. *Current Research in Nutrition and Food Science, 9*(2), 671-682.

<https://doi.org/10.12944/CRNFSJ.9.2.30>

National Council of State Boards of Nursing (NCSBN). (2022). *Next generation NCLEX-RN test plan*. <https://www.ncsbn.org/publications/2023-nclex-rn-test-plan>

National Council of State Boards of Nursing (NCSBN). (2020). *NCSBN's*

environmental scan: A portrait of nursing and healthcare in 2020 and beyond.

<https://www.ncsbn.org/6212.htm>

National League for Nursing (NLN). (2020). *Novice nurse educator competencies with task statements*. <https://tinyurl.com/y6ns9fa2>

National Organization of Nurse Practitioner Faculty (NONPF). (2024). *Competency implementation guide for nurse practitioner faculty*. <https://tinyurl.com/2nsu7y5y>

Nguyen, T., Nham, P., & Hoang, V. (2019). The theory of planned behavior and knowledge sharing. *VINE Journal of Information and Knowledge Management Systems*, 49(1), 76-94. <https://doi.org/10.1108/VJIKMS-10-2018-0086>

Office of Disease Prevention and Health Promotion (ODPHP). (2020). Nutrition and healthy eating. *Healthy People 2030*, U.S. Department of Health and Human Services. <https://tinyurl.com/ycxzsfc>

Oxford University Press. (2023, January). *Belief*, n. OED Online.

Oxford University Press. (2023, January). *Knowledge*, n. OED Online.
www.oed.com/view/Entry/104170

Oxford University Press. (2023, January). *Perception*, n. OED Online

Park, K., Cho, W., Song, K., Lee, Y., Sung, I., & Choi-Kwon, S. (2011). Assessment of nurses' nutritional knowledge regarding therapeutic diet regimens. *Nurse Education Today*, 31(2)192-197. <https://doi.org/10.1016/j.nedt.2010.05.017>

Parker, W., Steyn, N., Levitt, N., & Lombard, C. (2011). They think they know, but do they? Misalignment of perceptions of lifestyle modification knowledge among health professionals. *Public Health Nutrition*, 14(8), 1429-1438.

<https://doi.org/10.1017/S1368980009993272>

- Parmenter, K. & Wardle, J. (1999). Development of a general nutrition knowledge questionnaire for adults. *European Journal of Clinical Nutrition*, 53(4), 298-308. <https://doi.org/10.1038/sj.ejcn.1600726>
- Patil, R. & Balai, K. (2021). Nutrition knowledge attitude and practice of hospital nurses. *Research Horizons*, 11, 91-100.
- Perry, L. (1997). Fishing for understanding: Nurses knowledge and attitudes in relation to nutritional care. *International Journal of Nursing Studies*, 34(6), 395-404.
- Pierce, A. (2018). *Theory of planned behavior applied to high school science teachers implementing next-generation science standards*. [unpublished doctoral dissertation], University of Northern Colorado
- Portney, L. (2020). *Foundations of clinical research: Applications to evidence-based practice*, (4th ed.). F. A. Davis
- Raker, K. (2022). *An examination of nurse educators' knowledge, attitudes, instructional beliefs, and instructional practices of human trafficking*. [unpublished doctoral dissertation], Indiana University of Pennsylvania
- Rich, A., Brandes, K., Mullan, B., & Hagger, M. (2015). Theory of planned behavior and adherence in chronic illness: A meta-analysis. *Journal of Behavioral Medicine*, 38(4), 673-688. <https://doi.org/10.1007/s10865-015-9644-3>
- Rigby, R., Mitchell, L., Hamilton, K., & Williams, L. (2020). The use of behavior change theories in dietetics practice in primary health care: A systematic review of randomized controlled trials. *Journal of the Academy of Nutrition and Dietetics*,

120(7), 1172-1197. <https://doi.org/10.1016/j.jand.2020.03019>

- Romagnolo, D. & Selmin, O. (2016). Mediterranean diet and lifestyle for health promotion. In D. Romagnolo & O. Selmin (Eds.), *Mediterranean Diet: Dietary Guidelines and Impact on Health and Disease*, (pp. xx-xxi). Humana Press.
- Sacks, G. (2017). The shrinking of formalized nutrition education in health professions curricula and postgraduate training. *Journal of Parenteral and Enteral Nutrition*, 41(2), 217-225. <https://doi.org/10.1177/0148607116685049>
- Salas-Salvado, J., Diaz-Lopez, A., Ruiz-Canela, M., Basora, J., Fito, M., Corella, D., Serra- Jajem, L., Warnberg, J., Romaguera, D., Estruch, R., Vidal, J., Martinez, J., Aros, F., Vazquez, C., Ros, E., Vioque, J., Lopez-Miranda, J., Bueno-Cavanillas, A., Tur, J...Martinez-Gonzalez, M. (2019). Effect of a lifestyle intervention program with energy-restricted Mediterranean diet and exercise on weight loss and cardiovascular risk factors: One-year results of the PREDIMED-Plus Trial, *Diabetes Care*, 42(5), 777-788. <https://doi.org/10.2337/dc18-0836>
- Schaller, C. & James, E. (2005). The nutritional knowledge of Australian nurses. *Nurse Education Today*, 25, 405-412. <https://doi.org/10.1016/j.nedt.2005.04.002>
- Shea, A., Brophy, L., Nininger, J., Abbott, M. & Wilson, L. (2021). Nutrition integration across the nursing curriculum: A novel teaching model within a pre-licensure program. *Journal of Professional Nursing*, 37, 1162-1166. <https://doi.org/10.1016/j.profnurs.2021.10.006>
- Sirota, T. (2013). Attitudes among nurse educators toward homosexuality. *Journal of*

Nursing Education, 52(4), 219-227. <https://doi.org/10.3928/01484834-20130320-01>

Sodjinou, R., Bosu, W., Fanou, N., Deart, I., Kupka, R., Tchibindat, F., & Baker, S. (2014). Nutrition training in medical and other health professional schools in West Africa: The need to improve current approaches and enhance training effectiveness. *Global Health Action*, 7(1), 24827. <https://doi.org/10.3402/gha.v7.24827>

Stanek, K., Powell, M., & Betts, N. (1991). Nutritional knowledge of nurses in long-term health care facilities. *Journal of Nutrition for the Elderly*, 10(3), 35-48. <https://doi.org/10.1300/J052v10n03>.

Stotts, N., Englert, D., Crocker, K., Bennum, N., & Hoppe, M. (1987). Nutrition education in schools of nursing in the United States. Part 2: The status of nutrition education in schools of nursing. *Journal of Parenteral and Enteral Nutrition*, 11(4), 406-411.

Theila, M., Cohen, J., singer, P. , Liebman, C., & Kagan, I. (2016). The assessment, knowledge, and perceived quality of nutrition care amongst nurses. *Journal of Nutritional Medicine and Diet Care* 2(1), 1-5. <https://doi.org/10.23937/2572-3278.1510012>

Tsai, K., Chou, T., Kittikowit, S., Hongsuchon, T., Lin, Y., & Chen, S. (2022). Extending theory of planned behavior to understand service-oriented organizational citizen behavior. *Frontiers in Psychology*, 13, Article 839688. <https://doi.org/10.3389/fpsyg.2022.839688>

- Ulker-Demirel, E. & Ciftci, G. (2020). A systematic literature review of the theory of planned behavior in tourism, leisure, and hospitality research. *Journal of Hospitality and Tourism Management*, 43, 209-219.
<https://doi.org/10.1016/j.jhtm.2020.04.003>
- U.S. Department of Agriculture (defin). (2020). *Dietary guidelines for Americans 2020-2025*. U.S. Department of Health and Human Services.
- U.S. Department of Labor. (2018). *Occupational employment and wages, May 2017*.
<https://www.bls.gov/oes/current/oes291141.htm>
- Vesely R. (2014). The great migration. *Hospitals & Health Networks*. American Hospital Association. www.hhnmag.com/articles/5005-the-great-migration.
- Vickstrom, J. & Fox, A. (1976). Nutritional knowledge and attitudes of registered nurses. *Journal of the American Dietetic Association*, 68, 453-456.
- Waltz, C., Strickland, O., & Lenz, E. (2017). *Measurement in nursing and health research*, 5th ed. Springer Publishing Company
- Wilkins, J. (2008). The relationship among elementary teachers' content knowledge, attitudes, beliefs, and practices. *Journal of Math Teacher Education*, 11(2), 139-164. 10.1007/s10857-007-9068-2
- World Health Organization. (2022). *Health promotion*. <https://tinyurl.com/2bxry92s>
- World Health Organization. (2024). *Healthy diet*. <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
- Yfanti, E., Tsiriga, S., Yfantis, A., Tiniakou, I., & Mastrapa, E. (2011). Nutrition

- knowledge of students in a nursing school. *Health Science Journal* 5(2), 118-127.
<https://www.itmedicalteam.pl/articles/nutrition-knowledge-in-students-of-a-nursing-school-105628.html>
- Younas, A. & Quennell, S. (2019). Usefulness of nursing theory-guided practice: An integrative review. *Scandinavian Journal of Caring Science* 33(3), 540-555.
<https://doi.org/10.1111/scs.12670>
- Xia, J. (2020). Web-based nutrition education module for health professions students. *Journal of Nutrition Education and Behavior*, 52(7S), S77.
- Zeldman, J. & Andrade, J. (2020). Identifying physicians' and nurses' nutrition knowledge using validated instruments: A systematic narrative review. *International Journal of Nutrition and Food Sciences*, 9(2), 43-53.
<https://doi.org/10.11648/j.ijnfs.20200902.12>
- Zickgraf, H. & Barrada, J. (2022). Orthorexia nervosa vs. healthy orthorexia: Relationships with disordered eating, eating behavior, and healthy lifestyle choices. *Eating and Weight Disorders*, 17(4), 1313-1325.
<https://doi.org/10.1007/s40519-021-01263>