

# The Unknown Dangers of Kratom on Vulnerable Neonates

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Bachelor of Science in Nursing

To

The Honors College

Oakland University

In partial fulfillment of the  
requirement to graduate from

The Honors College

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School of Nursing

Oakland University

April 5, 2023

## **The Unknown Dangers of Kratom on Vulnerable Neonates**

### **Abstract**

In the realm of herbal supplements, Kratom, often marketed as a harmless herbal remedy, unveils a darker reality as newborns enter the world struggling with intense withdrawal symptoms (Eldridge et al., 2018). Made from the leaves of a plant native to Southeast Asia and Africa, Kratom is readily available as an herbal supplement, marketed for its relaxation and mood-enhancing properties. Despite its portrayal as a harmless substance, Kratom operates on the same brain receptor sites as opioids, inducing a sense of euphoria when consumed at higher doses, and mirroring the psychological effects of these potent drugs. Sold openly at gas stations and not FDA-approved, Kratom takes on various forms, from chewable leaves to brewed tea or liquid ingestion. The ease of access to Kratom, often masked as a harmless, herbal remedy, puts many vulnerable individuals at risk, as they unknowingly introduce a dangerous substance to their bodies (Eldridge et al., 2018).

This issue becomes particularly concerning when pregnant women, perhaps unaware of the potential risks, consume Kratom throughout pregnancy. The consequence is neonates beginning life in distress, exhibiting symptoms such as seizures, tremors, sleeping and feeding problems, vomiting, diarrhea, sweating, and fever. Deception lurks in the marketing of Kratom as an herbal tea, leaving women and children vulnerable to the adverse effects of this drug. This dangerous substance requires a closer examination of its severe side effects on mothers who use Kratom during pregnancy. Neonates born to mothers who used Kratom face the challenge of Neonatal Abstinence Syndrome (NAS), a consequence often concealed from public awareness. The development of research and the spread of information on this topic is pivotal in addressing the hidden dangers of Kratom use. The purpose of this paper is to raise awareness about this

critical concern, and ultimately decrease the incidence of neonatal abstinence syndrome resulting from maternal Kratom use by providing a comprehensive literature review of existing research articles (Eldridge et al., 2018).

## **Methods**

The Cumulative Index of Nursing and Allied Health Literature (CINHAL) database was used to find articles to be included in the literature review section. In order to limit results down to relevant and current research, filters applied during the search include a subset of core nursing journals and a time marker of articles published between January 2019 to April 2024. Some of the search terms used in this process were “Kratom,” “neonates,” “pregnancy,” “maternal,” and “neonatal abstinence syndrome.” The articles were reviewed and chosen based on the population, nursing intervention, and study design. Finally, the articles and journals chosen were cross-referenced and checked to determine if the journals chosen for this literature review were credible and reputable journals. Any articles that are not approved by the International Academy of Nursing Editors (INANE), have a systematic study design or are inconsistent with the search terms used, were excluded.

## **Introduction**

Veltri et. al (2019) defines Kratom (*Mitragyna speciose* Korth.) as an evergreen tree native to Southeast Asia that is known for its medicinal and recreational uses. The major active compound of the drug is the indole alkaloid. These alkaloids act as partial agonists on opioid receptors in the human body. In the cell, they bind to  $\mu$ -opioid receptor sites which causes activation of the G-protein-coupled signaling pathway. The difference between this drug and major opioids is that Kratom does not lead to the activation of  $\beta$ -arrestin 2 which is what brings

on a lot of the undesired effects opioids can cause such as respiratory depression, hypotension, bradycardia, and constipation. Kratom sales have increased throughout North America and Europe which has caused increased safety concerns due to other countries publicly banning the drugs and its associated active alkaloids. Due to the dangerous and negative effects of Kratom, many countries in Europe have taken action to ban Kratom use and curb negative outcomes. In the United States, Kratom is currently not recognized by the Food and Drug Administration (FDA). Due to this, there are issues with the regulation and identification of Kratom. This is especially prevalent in a hospital or medical setting when dealing with patients who have consumed Kratom for its desirable effects. There have been suggestions regarding placing this compound into the Controlled Substance Act Schedule I by the US Drug Enforcement Administration (DEA). However, despite the benefits this would bring, this decision has not been put in place (Veltri et. al 2019).

This drug holds historical significance in Southeast Asia and has been dated back over 150 years. These early reports of Kratom document it as a stimulant when fresh leaves are chewed, and as a relaxing, analgesic effect when brewed into a tea. The first observed literature on Kratom dates back to the year 1836. The leaves of the trees were used in Malaysia and Thailand for two main applications. First, it was used as a stimulant to promote work efficiency and tolerance for workers in manual labor jobs performed in harsh climates and conditions. Secondly, it was used for a range of medicinal issues. In the West, Kratom is seen as a treatment for a multitude of health conditions including chronic pain, mental health disorders, and opioid dependency. A study done investigating the prevalence of Kratom use in Thailand residents surveyed 26,633 respondents aged 12-65 years (Veltri et. al 2019). The lifetime occurrence of Kratom use among this sample was 2.3%, which scored higher than marijuana use. The high

prevalence of this drug can be concluded that it is due to the long history of the drug used both in medicinal and recreational ways. Long-term use by day workers to increase endurance and stamina in harsh working conditions often results in the development of dependence and addiction to the drug (Veltri et. al 2019). On the positive side, according to several studies done in Malaysia, Kratom use and addiction do not inhibit daily functioning. However, this can encourage people to continue with Kratom use as they do not see the immediate negative effects of this drug on their lives. It is common for teenagers and adolescents to mix crushed Kratom leaves with a caffeinated drink such as soda or create a mixture containing Kratom and cough syrup. This furthers the euphoric sense the drug can have on an individual. Easily accessible, Kratom is sold online and in stores in the United States. Some stores that carry Kratom include health/wellness stores including herbal supplement stores, tobacco/smoke shops, and gas stations. In the United States, consumption of Kratom is primarily done in liquid forms. However, Kratom also can be consumed through the addition of powders into foods or beverages, oral capsules, or teas. Oftentimes a tea is made from steeping a leaf from the Kratom plant in hot water. This tea is usually accompanied by a bitter taste, so sweetening agents like honey or sugar are regularly added. Deceptive branding strategies are used to make Kratom appear desirable and harmless. Articles use enticing words like “stress relief”, “anti-anxiety”, and “pain control” to draw consumers in. An article by Team Mindful, posted in 2023, titled *Health Benefits of Kratom: Expert’s Guide*, is one example of how it could be easy for an individual to fall into the trap of the harmful marketing often seen painting Kratom in a false light.

NEW TO KRATOM

# Health Benefits of Kratom: Expert's Guide

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*Kratom: More Than a Leaf – Unearthing its Extraordinary Health Boosting Potential*



In recent years, the herbal supplement market has seen a surge in popularity, with a growing interest in alternative remedies for various health conditions. One such botanical wonder that has garnered attention is Kratom (*Mitragyna Speciosa*), a tree native to Southeast Asia. Known for its diverse range of effects and potential benefits,

<https://mindfulkratom.com/health-benefits-of-kratom/#>

As the availability and popularity of Kratom grows, there is an increasingly prevalent question: What are the unknown dangers of Kratom?

## Literature Review

The opioid crisis continues to rage across Canada, creating an urgent need for heightened awareness within the medical community regarding Kratom, an easily accessible and legally obtainable drug. A case study done by McKay (2018), provides an example of the harmful effects, addiction, potential, and withdrawal symptoms associated with Kratom use, particularly in maternal and neonatal populations. A 29-year-old woman with a complex obstetric history involving pregnancies, admissions for opioid detoxification, and chronic pain, was admitted while postpartum with the primary goal of tapering down her daily Kratom use. The patient's journey into Kratom use began during her pregnancy. Her attempts to reduce her Kratom intake resulted in symptoms indicating opioid withdrawal. This young mother's story emphasizes the challenging and sobering nature of Kratom dependence. The neonate, born slightly premature at 37 weeks and five days, exhibited withdrawal symptoms. These symptoms warranted a need for a NICU admission and intravenous morphine treatment. Despite being a controlled substance in Southeast Asia, the legal status and lack of regulation of Kratom in both the United States and Canada contribute to its escalating popularity, raising concerns about its potential for misuse. This case presented by McKay (2018), advocates for a rooming-in approach as an effective strategy for managing neonatal Kratom withdrawal. This holistic treatment emphasizes the critical role of close contact between the mother and the infant. Extensive evidence supports rooming-in as a cost-effective and beneficial approach for neonates experiencing opioid withdrawal. Given the easily addictive properties of Kratom, there is an important need for holistic care and patient education. Providers must offer support and detailed information regarding the risks associated with the use of unregulated drugs like Kratom. As the popularity of natural alternatives continues to grow, primary care providers must remain persistent regarding the potential dangers posed by Kratom and other unregulated psychoactive herbs. This case

highlights the importance of a clear understanding of Kratom's impact on maternal and neonatal outcomes. Healthcare providers have a responsibility to practice individualized care and detailed patient education, to increase safe outcomes for both mother and baby. These conversations between patients and healthcare providers become key in navigating the complex topic of substance use during pregnancy.

Neonatal abstinence syndrome is becoming increasingly common in the US due to illegal drug use. However, even a legal drug like Kratom, sold over the counter, is contributing to this crisis. Despite the deceptive marketing portraying Kratom as a natural alternative to opioids, Kratom poses serious health risks and complications. Davidson et al. (2019) discuss how this affected scenario affected a newborn baby girl and her mother. A 29-year-old mother gave birth to a full-term baby girl after a healthy pregnancy. The mother struggled with multiple health complications including fibromyalgia, chronic low back pain, anxiety, and a long history of cigarette smoking. In attempts to medicate and treat associated symptoms, the mother had used Kratom along with other prescribed medications and over-the-counter herbal supplements. These included gabapentin, clonazepam, and prenatal vitamins. Throughout pregnancy, all of the mother's prenatal labs were within defined limits, excluding a group B streptococcus (GBS) screening which was treated prophylactically with penicillin before birth. The mother had a spontaneous vaginal delivery with a normal transition at birth. Apgar scores were nine at one and five minutes. Only 24 hours after the healthy delivery, the newborn began showing signs of withdrawal. These symptoms included poor feeding, hypertonia, excessive sneezing, a high-pitched cry, and jitteriness which all pointed towards neonatal abstinence syndrome. The neonate showed negative results on a urine toxicology panel and a CBC was drawn, showing normal limits. Through further assessment with the Finnegan Neonatal Abstinence Scoring

System (FNAST)--a commonly used scoring tool to assess infants exposed in utero to opioids--a diagnosis of Neonatal Abstinence Syndrome was given to the newborn baby girl. In order to receive more extensive care, the neonate was transferred to a Neonatal Intensive Care Unit (NICU). During the admission assessment, the mother's history with the use of the "herbal supplement" Kratom was revealed. Throughout this process, the newborn continued to struggle and experienced tachypnea and hyperthermia. To treat these grueling symptoms, the neonate required pharmacological management of symptoms through oral morphine administration to manage the condition efficiently. The baby responded to treatment well and began weaning off of morphine on the third day of treatment. After complete cessation of morphine, she was observed for 48 hours and was discharged home. The neonates' stay was a total of 14 days. Morphine therapy was administered for a total duration of 11 days. This sequence of events all occurred for this newborn as a result of a "harmless herbal supplement." Kratom is dangerous and unregulated. Despite a positive response to pharmacological therapy, the neonate could've avoided this condition altogether if more extensive and readily available information on the truth of Kratom had been marketed publicly.

Neonatal Abstinence syndrome has become an increasingly prevalent concern, predominantly linked to maternal opioid use during pregnancy. Amidst the opioid epidemic, the pursuit of non-opioid alternatives has led individuals to explore various herbal supplements, including Kratom. This comprehensive review of the article "Neonatal absence syndrome due to maternal Kratom use" presented by Eldridge et al. (2018), aims to dive deeper into the classification of Kratom, as an opioid, its increasing popularity, and the concern for neonatal health. Kratom has gained popularity for its legal status and widespread availability. Despite its marketing as a non-opioid remedy for opioid withdrawal, ongoing conversations are occurring

regarding its classification. The United States Food and Drug Administration (FDA) recognizes Kratom as having opioid-like effects, given its action at opioid receptors. The herbal supplement has become increasingly popular with diverse and appealing formulations, such as powder, tea, or capsules. These enticing forms of this drug are available both online and in retail stores. The case study by Eldridge et al. (2018), stresses a devastating account of Neonatal Abstinence Syndrome in an infant born to a mother self-treating an opioid dependence with Kratom tea. After struggling with oxycodone addiction, this mother turned to a substance that was marketed as “harmless” to beat her addiction and ended up unknowingly harming her baby. When a pregnant mother uses Kratom, the drug crosses the placental barrier and affects the developing fetus. After an uncomplicated birth and a seemingly clear drug screen, the infant began to exhibit classic symptoms consistent with opioid withdrawal, including sneezing, jitteriness, excessive, suck, facial caution, and irritability. This complexity arose as Kratom was not detectable through standard drug screens, complicating the diagnosis and management of Neonatal Abstinence Syndrome. Without a way to detect Kratom in the body system, the infant is left vulnerable during precious moments when treatment could be used to provide the infant with comfort amidst these symptoms. Eventually, a traditional protocol for opioid-induced Neonatal Abstinence Syndrome was introduced into the infant’s care. This includes administering morphine as an opioid-replacement therapy to control symptoms, creating a low-stimulus environment for the newborn, swaddling, and skin-to-skin contact between the mother and her infant. However, the case study highlights the struggle in determining an optimal morphine dose due to inconsistent symptoms. Despite the FDA classification of Kratom compound as an opioid in 2018, the dangerous herbal supplement remains unregulated and available over the counter. In the United States, there are no federal regulations on the marketing and selling of Kratom

meaning there are no national quality and safety guidelines for products containing Kratom; kratom can even be found in gas stations sold in enticing flavors and colors in the forms of gummies and extracts (Herb 2023). As the opioid epidemic continues, cases of Neonatal Abstinence Syndrome due to maternal Kratom use are expected to rise. This highlights the importance of increasing awareness among pediatricians, healthcare, workers, and politicians. There is a crucial role all healthcare workers play in recognizing, managing, and advocating for regulations to promote the well-being of neonates born to mothers using this herbal supplement. With Kratom undetectable in standard drug screens, clinicians must proactively inquire about its use during pregnancy and properly educate mothers before conceiving as well as during prenatal care. As cases of neonatal abstinence syndrome due to Kratom exposure are likely to increase, pediatricians become important in ensuring the thorough care of affected neonates and enforcing regulatory measures.

Murthy et al. (2018) reports on a case study of a newborn experiencing neonatal abstinence syndrome due to maternal use of Kratom tea. The mother was 37 years old and gravida 2. She had a history of inactive genital herpes, chronic depression and anxiety, restless leg syndrome, and recurring urinary tract infections. A year before conceiving, she was prescribed a selective serotonin reuptake inhibitor; unfortunately, she remained significantly impacted by her depression. This is when she desperately turned to Kratom tea as a way to self-medicate and control symptoms. The ingestion of this drug three-to-four times per day controlled symptoms of restless leg syndrome as well as anxiety and depression. After a full-term pregnancy, the healthy 3.68kg female newborn was delivered via a C-section and transferred to a mother-baby postpartum unit. Within six to eight hours of birth, she was exhibiting signs of withdrawal including being jittery and having increased tone. By the 12th

hour after delivery, it was reported the newborn had increased irritability. The newborn also experienced other other feed-related issues including sleepiness between feeds and excessive sucking. Pharmacology therapy using morphine was introduced and was successful in reducing the severity of symptoms. In the following days, there were multiple unsuccessful attempts to wean her off morphine. Eventually, she was discharged on day 12 of treatment on oral morphine. A month later, the newborn was still exhibiting irritability and periods of prolonged crying. Finally, after two months of morphine therapy, the infant was successful at weaning off of pharmacological treatments. This is one of the first documented cases of neonatal abstinence syndrome due to maternal use of Kratom. With increasing Kratom use, the lack of a conventional drug screening that detects the drug, and the highly available status of the drug, a thorough maternal history is very important to obtain during prenatal care. As Kratom gains popularity as an alternative option to treat opioid withdrawal, the adverse effects of this drug will continue to rise. Withdrawal symptoms are experienced by around 76% of users who suddenly stopped Kratom intake. The symptoms lasted anywhere between one to three days in 64% of users and more than three days in 36% of users. Despite these severe side-effects Kratom is categorized as an herbal supplement under U.S. Department of Agriculture and Drug Enforcement Administration Policy and is a legal substance. This raises major concerns about the potential negative influence this drug can have if this status doesn't change (Murthy et al. (2018).

As Kratom has moved away from its use for medicinal and recreational purposes and is growing in popularity as a self-treatment method for opioid use disorder, the use of this herbal substance raises concerns. The work done by Smid et al. (2018) sheds light on the clinical outcomes, challenges, and considerations associated with Kratom use in pregnancy. This drug, also known as krathom, ketum, biak, or kakuum, is consumed globally for its euphoric effect and

as an alternative to opioids. The issue arises when the deceptive marketing of this substance catches the attention of mothers who begin unknowingly consuming a product harmful to their unborn child. Smid et al. (2018), present two compelling cases of pregnant women struggling with kratom dependence, both exhibiting symptoms consistent with opioid withdrawal. The additional layers of their medical histories, including anxiety, chronic pain, and prior substance use add complexities to the management and recovery of Kratom dependence during their pregnancies. Opioid replacement therapies with buprenorphine emerged as a successful treatment in stabilizing these pregnant women. Smid et al. (2018) describe the challenges faced by healthcare professionals in obstetrics and the lack of awareness regarding Kratom use among pregnant women with opioid use disorders. The lack of data on the prevalence of Kratom in the general population, coupled with the absence of information about the dangers associated with pregnancy and breastfeeding, adds complexity to the care of these prenatal patients. The pharmacological properties of Kratom and the fact it is undetectable in standard urine drug screens pose additional challenges for screening and monitoring during pregnancy. The lack of product regulation further complicates the risks for both maternal and neonatal well-being. Smid et al. (2018) also draw attention to multiple other public health concerns with Kratom including medical complications such as liver toxicity, seizures, and warnings of potential Salmonella contamination in Kratom-containing products. Women of childbearing age and with a history of substance use disorder should be thoroughly educated about these potential side effects. Providers should be proactively screening patients for potential Kratom use. The options for alternative opioid replacement therapy should also be made available to individuals qualifying for treatment. Options like buprenorphine suggest a promising solution for managing kratom dependence during pregnancy. No matter the treatment plan, there is an increasing need for

transparent conversations with pregnant women about the limited information on maternal and fetal effects of Kratom, available alternatives, and treatment options. The case studies are prime examples to highlight the importance of proactive screening, transparent communication, and a multidisciplinary approach to address the challenges posed by Kratom during pregnancy. Further research is needed to fill the existing gaps in knowledge providing a more extensive foundation for clinical guidelines and recommendations.

### **Conclusion**

The findings presented in this thesis shed light on the unknown dangers of Kratom on vulnerable neonates, emphasizing the urgent need for increased awareness and regulation surrounding its use, particularly during pregnancy. Through an extensive literature review, multiple case studies have been thoroughly examined, highlighting the grave impact of Kratom consumption during pregnancy and the effect it poses to neonates developing Neonatal Abstinence Syndrome. Despite being marketed as a natural herbal supplement, Kratom operates on the same receptor sites in the brain as opioids do. This induces a euphoric effect which mirrors the psychological effects of potent street drugs. Pregnant mothers, often unaware of the risks, ingest Kratom throughout their pregnancy, exposing their unborn child to harsh effects. Neonates born to mothers who used Kratom experience the challenges of Neonatal Abstinence Syndrome, characterized by withdrawal symptoms including seizures, tremors, feeding issues, and irritability. The lack of regulation around Kratom, its easy accessibility, and deceptive marketing increase the risk, leaving women and children alike vulnerable to its harmful effects. Standard toxicology screenings currently cannot detect Kratom use which complicates diagnosis and management of Kratom-associated Neonatal Abstinence Syndrome. Pharmacological treatment with opioids like morphine is often required to manage withdrawal symptoms in

affected neonates. Healthcare professionals play a crucial role in recognizing and addressing Kratom use during pregnancy, advocating for regulatory measures, and providing patient education to mitigate risks. Clear communication and proactive screening are essential in managing Kratom dependence. Moving forward, further research is needed to fill existing knowledge gaps and inform the public population vulnerable to Kratom's effects. The findings of this thesis underscore the importance of needed action to address the dangers of Kratom on neonatal health.

### **Limitations**

While this study contributes to the understanding of Neonatal Abstinence Syndrome (NAS) resulting from maternal Kratom use during pregnancy, it is essential to acknowledge several limitations that affect the scope and generalization of the findings. Firstly, despite the multiple credible articles cited in this thesis, research on NAS due to maternal Kratom use remains relatively limited. The available studies lack large-scale, longitudinal investigations and vary in sample sizes. As a consequence, the conclusions drawn in this paper may not capture the full spectrum of effects that adequately represent the diverse populations affected by this issue.

Secondly, there are significant gaps in knowledge regarding the issue of NAS related to Kratom exposure in utero. Studies examining long-term developmental outcomes, effects, and potential genetic predispositions associated with NAS caused by maternal Kratom use are lacking. Future research should prioritize longitudinal studies tracking infants exposed to Kratom in utero to assess their cognitive, behavioral, and physiological development over time.

Thirdly, the absence of diagnostic tools for identifying NAS resulting from maternal Kratom use poses a significant limitation. Current reliance on clinical assessment and subjective reporting may lead to underdiagnosis or misdiagnosis of cases. Urgent attention is needed to

develop reliable and standardized blood tests or urine drug screenings able to detect Kratom in mothers and neonates. This development would allow for prompt and accurate diagnosis in clinical settings, possibly improving the health outcomes and well-being of the affected neonates.

Additionally, ethical considerations surrounding research involving pregnant mothers and neonates introduce additional barriers. Conducting controlled trials or longitudinal studies involving women who use Kratom throughout pregnancy raises ethical dilemmas regarding the potential risks involved. Obtaining approval for these studies and ensuring the safe management of individuals can be time-consuming and challenging. This inhibits progress in the development and reporting of research to understand neonatal abstinence syndrome (NAS) due to maternal Kratom use.

Finally, neonatal abstinence syndrome (NAS) resulting from maternal Kratom use is influenced by multiple factors, including but not limited to dosage, duration of exposure, co-occurring substance use, maternal health status, and genetic predispositions. This presents a considerable challenge to researchers working on this topic. While this thesis touches on some of these factors, it is important to recognize that the diverse nature of neonatal abstinence syndrome due to Kratom warrants further investigation through interdisciplinary collaborations and comprehensive research.

While this thesis provided valuable insights into neonatal abstinence syndrome (NAS) resulting from maternal Kratom use, it is important to acknowledge the limitations that constrain the generalizability and depth of the findings. Addressing these limitations through continued research efforts, medical advancement, and interdisciplinary collaborations is essential to improve our understanding and management of neonatal abstinence syndrome associated with maternal Kratom use.

## **Acknowledgments**

Embarking on this academic endeavor of completing nursing school has been a transformative journey and inspired the creation of this thesis. I am eternally grateful for the support and guidance I have received along the way. My deepest appreciation goes to my mentor, Kimberly Finch, whose wisdom and inspiration have been key in the shaping of this thesis. Professor Finch's influence on my academic career started when she was my Obstetrics (OB) clinical instructor. Those early mornings at the hospital were made worthwhile as I learned how to be successful in the world of OB. I also extend my sincere gratitude to Professor Stephanie Vallie, whose passion for OB has left a mark on my academic pursuits. Professor Vallie's infectious enthusiasm and commitment to excellence have instilled in me a profound wonder for the world of OB and mother-baby nursing. Her encouragement and expertise have not only enriched my understanding of the subject matter but have also motivated me to dive deeper into the complexities of this field. The formation of this thesis can be traced back to the invaluable experiences and knowledge gained under the guidance of both Professor Kimberly Finch and Professor Stephanie Valley. Their combined influence has been pivotal in shaping the scope and purpose of this research.

I would also like to express my gratitude to my close circle of friends and family. Their unwavering support and understanding during the demanding years of nursing school have been a huge component of my success. Their encouragement and belief in my abilities have fueled my determination to overcome challenges and persevere. To my parents, siblings, and friends, your encouragement has been a constant source of strength. I am beyond grateful for the sacrifices made, and the encouragement provided, enabling me to pursue my passion in nursing.

This thesis stands as a testament to the combined efforts of those exceptional individuals who have played pivotal roles in my academic and personal development. Their collective influence has not only shaped this research, but also contributed to my growth as a student, researcher, and healthcare professional.

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