

University of Nevada, Reno

Content And Effects Of Facebook Breastfeeding Support Groups For WIC Mothers

A dissertation submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy in Public Health

by

Louisiana M. Sanchez, MScIH

Sung-Yeon Park, Ph.D., Dissertation Advisor

May 2024



THE GRADUATE SCHOOL

We recommend that the dissertation
prepared under our supervision by

Louisiana M. Sanchez

entitled

**Content And Effects Of Facebook Breastfeeding Support Groups
For WIC Mothers**

be accepted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

Sung-Yeon Park, Ph.D.

Advisor

Elizabeth Christiansen, Ph.D.

Committee Member

Ann Weber, Ph.D., MPH

Committee Member

Kristen Clements-Nolle, Ph.D., MPH

Committee Member

Gi Woong Yun, Ph.D.

Graduate School Representative

Markus Kemmelmeier, Ph.D., Dean

Graduate School

May 2024

Abstract

Breastfeeding inequity in the United States is a significant public health concern, with low-income women facing disproportionate challenges that contribute to lower rates of breastfeeding, highlighting a critical need for targeted support and intervention strategies. This dissertation explores the transformative potential of Facebook Breastfeeding Support Groups (FBSGs) in supporting low-income women, particularly participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), in their breastfeeding journey. Comprising three papers, the study adopts a multifaceted approach to unpack the dynamics of FBSGs in promoting and supporting breastfeeding. The first paper leverages the Uses and Gratifications Theory, analyzing the content of posts made by participants and administrators as well as the interactions among them mediated through the posts. The second and third papers are grounded in the Integrated Behavioral Model. In the second paper, a focus group study was conducted to gather rich, in-depth insights from WIC participants and administrators. The third paper adopts a quantitative approach, utilizing a cross-sectional survey to assess the association between the level of FBSG participation and breastfeeding duration with social support and self-efficacy as mediating variables. The first paper reveals that active participation and posts about breastfeeding-related experiences increase community interaction. The second paper emphasizes FBSG's role in fostering positive breastfeeding attitudes and underscores participants' preference for lactation consultants as group administrators. Lastly, the third paper indicates positive associations between higher levels of FBSG participation and breastfeeding social support and self-efficacy among WIC participants. This dissertation demonstrates the effectiveness of FBSGs in aiding WIC participants and elucidates the mechanisms through which FBSGs promote breastfeeding among low-income women.

Dedication

To my family and my mentor, Dr. Roy F. Oman.

Table of Contents

Abstract	i
Dedication	ii
List of Tables	vi
List of Figures	vii
CHAPTER I. Introduction	1
Literature Review	2
<i>The Importance of Breastfeeding</i>	2
<i>Breastfeeding Disparities in the United States</i>	3
<i>Barriers to Breastfeeding among Low-income Women</i>	6
<i>The Emergence and Role of Facebook Breastfeeding Support Groups</i>	12
<i>Gaps in the Literature</i>	16
Theories	17
<i>Uses and Gratifications Theory</i>	17
<i>Integrated Behavioral Model</i>	17
Study Aims	19
CHAPTER II. Methods	21
Study Design	21
<i>Paper 1: Content Analysis</i>	21
<i>Paper 2: Qualitative Focus Groups</i>	22
<i>Paper 3: Cross-sectional Survey</i>	22
Setting	23
Participants	24

Ethical Approval	25
CHAPTER III. Manuscripts	26
Paper 1 – Growth and Engagement Patterns of a Facebook Breastfeeding Support Group: A Case Study Using Content Analysis and Group Insights	26
<i>Abstract</i>	26
<i>Introduction</i>	26
<i>Methods</i>	31
<i>Results</i>	34
<i>Discussion</i>	38
Paper 2 – Providing Breastfeeding Support through Facebook Groups: An Integrated Behavioral Model Analysis of Focus Groups among WIC Participants and Administrators	43
<i>Abstract</i>	43
<i>Introduction</i>	44
<i>Methods</i>	47
<i>Results</i>	49
<i>Discussion</i>	58
Paper 3 – Promoting Breastfeeding among WIC Participants through Facebook Breastfeeding Support Group Participation: A Serial Mediation Model	62
<i>Abstract</i>	62
<i>Introduction</i>	63
<i>Methods</i>	65
<i>Results</i>	70

<i>Discussion</i>	74
CHAPTER IV. Conclusion	78
Research Findings	78
Recommendations for Future Research	80
Contributions to Knowledge and Practice	81
CHAPTER V. Appendices	84
Appendix A	84
Appendix B	85
References	87

List of Tables

Table 1. The Number of Posts by Motivation, Format, and Source and the Differences Between the Posts Made by Administrators and Users	36
Table 2. Predictors of Motivations, Formats, and Sources Toward the Number of Views, Reactions, and Comments	37
Table 3. Sociodemographic Characteristics of Participants by Level of FBSG Participation	71
Table 4. Breastfeeding Characteristics of Participants by Level of FBSG Participation	71
Table 5. Results from PROCESS macro testing breastfeeding social support and self-efficacy mediation model	73

List of Figures

Figure 1. Wisconsin WIC Projects by Number	24
Figure 2. Wisconsin WIC Population by Race	25
Figure 3. The Number of Total Users and Average Daily Active Users Each Month in Milwaukee County WIC Facebook Breastfeeding Support Group, February 2021–July 2021	35
Figure 4. Path Models of Direct and Indirect Associations between FBSG Participation and Breastfeeding Duration	74

CHAPTER I

Introduction

The fabric of social support and public health interventions is being rewoven through the threads of online communities and social media platforms. Among these, Facebook Breastfeeding Support Groups (FBSGs) have emerged as pivotal arenas for nurturing low-income women in their breastfeeding journey. This dissertation explores the transformative potential of these digital platforms, which offer a unique blend of peer support, expert advice, and communal solidarity, all accessible with the swipe of a finger.

Breastfeeding, while a natural process, is fraught with challenges magnified by socioeconomic disparities. For low-income women, the hurdles to successful breastfeeding are not just physical but are compounded by systematic barriers such as limited access to healthcare resources, lack of family support, and pervasive misinformation. In this landscape, FBSGs stand as a beacon of support, offering a space that transcends geographic and socioeconomic boundaries to provide critical information, encouragement, and a sense of belonging.

The significance of these groups is not merely in their existence but in their operation and influence. They represent a confluence of technology and human empathy, where algorithms meet personal stories, and data analytics reveal engagement, support, and positive changes in health behaviors. By examining the growth and engagement patterns, the motivations behind postings, the nature of interactions, and the associations between the level of FBSG participation, breastfeeding social support, self-efficacy, and duration behaviors, this dissertation delves into how FBSGs are reshaping the support network for breastfeeding among low-income women.

This inquiry is rooted in a broader context of digital health interventions, where the power of online communities is harnessed to address public health challenges. As we navigate

through the findings from content analysis, focus groups, and survey analyses, we uncover the quantitative metrics of success and the qualitative experiences of mothers who find these groups to be a lifeline, a forum for learning, and a platform for sharing.

Thus, this dissertation is not an academic exploration alone; it is a narrative of empowerment, a testament to the resilience of mothers navigating the complexities of breastfeeding, and a reflection on the role of digital platforms in bridging the divide between access and need. As we embark on this journey, readers are encouraged to consider the implications of these findings for designing digital public health interventions that are inclusive and responsive to the needs of marginalized populations.

Literature Review

The Importance of Breastfeeding

Breastfeeding is a vital practice that promotes the health and well-being of infants and mothers (CDC, 2024; [ODPHP], 2024; WHO, 2024). Breastfed infants, compared to non-breastfed infants, have lower rates of infectious disease, childhood obesity, and improved cognitive outcomes (Qiao et al., 2020; Victora et al., 2016). In addition, breastfeeding protects mothers against breast and ovarian cancers, type 2 diabetes, and cardiovascular disease (Ip et al., 2009; Victora et al., 2016). These benefits increase with exclusive breastfeeding during the first six months of life and longer duration of breastfeeding (Pérez-Escamilla et al., 2023; Victora et al., 2016).

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of a baby's life, followed by continued breastfeeding and appropriate complementary foods up to two years of age or beyond (WHO, 2024). This guideline ensures optimal health, growth, and development of infants worldwide (WHO, 2024). The Centers for Disease Control

and Prevention (CDC) aligns with the WHO's recommendation, advocating for exclusive breastfeeding for the first six months of an infant's life (CDC, 2024). Following this period, the CDC recommends continuing breastfeeding while introducing complementary foods until the child is at least 12 months old and thereafter, as long as breastfeeding is mutually desired by the mother and baby (CDC, 2024).

The Healthy People 2030 initiative, a comprehensive set of national health objectives, underscores the importance of breastfeeding for infants and mothers by setting ambitious goals to enhance breastfeeding practices across the United States (U.S.) (ODPHP, 2024). Specifically, the initiative seeks to increase the overall percentage of infants who are ever breastfed, thereby recognizing the foundational role of breastfeeding in early-life nutrition (ODPHP, 2024). Furthermore, it emphasizes the importance of exclusive breastfeeding for the first six months, highlighting its unparalleled benefits in supporting infant health and development (ODPHP, 2024). Additionally, Healthy People 2030 aims to boost the proportion of infants who continue to breastfeed at 12 months of age, reflecting a commitment to extending the health advantages of breastfeeding well into the first year of life (ODPHP, 2024). The initiative aims to foster a healthier future for the next generation through these targeted goals by promoting breastfeeding as a key public health strategy (ODPHP, 2024).

Breastfeeding Disparities in the United States

The U.S. has been an outlier among its economic peers in breastfeeding rates, a disparity that is pronounced among low-income women, particularly participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (Diaz et al., 2023; Zhang et al., 2021; Zhang et al., 2019). According to the CDC, 83% of infants are ever breastfed, and 25% are exclusively breastfed at six months among the general population (CDC, 2020,

2022). In comparison, 37% of WIC infants are breastfed (comparable to ever breastfed), and 13% are fully breastfed (comparable to exclusively breastfed at six months) (USDA, 2023). This divergence is attributed to multiple systematic and socioeconomic barriers, including but not limited to lack of breastfeeding education and support, inadequate maternity leave policies, and pervasive marketing of infant formula (Rasmussen et al., 2016; Segura-Pérez et al., 2021; Segura-Pérez et al., 2022).

Breastfeeding initiation. Studies have explored the link between enrollment in the WIC program and breastfeeding initiation (Bunik et al., 2009; Flower et al., 2008; Hendricks et al., 2006; Jensen, 2012; Ma et al., 2014; Mao et al., 2012; Marshall et al., 2013; Ryan & Zhou, 2006; Ziol-Guest & Hernandez, 2010). Most studies, except two (Bunik et al., 2009; Hendricks et al., 2006), found a significant association between WIC participation and a reduced likelihood of breastfeeding initiation.

Following the examination of the relationship between enrollment in the WIC program and breastfeeding initiation, there are interrelated factors that may affect breastfeeding initiation among WIC women. Positive associations with breastfeeding initiation among WIC mothers include immediate post-delivery breastfeeding in hospital settings, support from peer counselors, being a foreign-born mother, the mother being married, the mother being non-Hispanic white or Hispanic, living in the Western U.S., income above the poverty threshold, participation in WIC for three months or longer, and older maternal age (Darfour-Oduro & Kim, 2014; Gross et al., 2009; Jacobson et al., 2015; Ma & Magnus, 2012; Yun et al., 2010; Ziol-Guest & Hernandez, 2010). On the other hand, breastfeeding initiation among WIC mothers has been negatively associated with the receipt of food stamps, younger maternal age, and mothers being at or below the poverty level (Gleason et al., 2020; Gross et al., 2009).

Previous studies suggest the importance of multimodal professional and lay support in boosting breastfeeding initiation (Haider et al., 2014; Hildebrand et al., 2014; Ogbo et al., 2020; Renfrew et al., 2012). For instance, a systematic review found that all forms of extra support for breastfeeding mothers, including professional and lay support, increased the initiation and duration of breastfeeding (Renfrew et al., 2012). Moreover, interventions spanning from pregnancy through postnatal period and involving various methods of education and support are more effective than those focusing on a single approach (Hannula et al., 2008; Kaunonen et al., 2012). Additionally, verbal encouragement and practical support from partners or fathers can improve breastfeeding initiation and duration (Ogbo et al., 2020).

Breastfeeding duration. Numerous studies have identified a link between WIC participation and either lower odds of breastfeeding or higher risk for discontinuation of breastfeeding at four, six, or 12 months (Bunik et al., 2009; Flower et al., 2008; Hendricks et al., 2006; Jensen, 2012; Ryan & Zhou, 2006; Shim et al., 2012; Ziol-Guest & Hernandez, 2010). For example, a study utilized cross-sectional data from the National Immunization Survey and discovered that the average length of breastfeeding was approximately 1.91 months shorter for WIC participants compared to those eligible but not participating in WIC [95% confidence interval (CI): 1.43 – 2.40] (Jensen, 2012).

Following the examination of the relationship between enrollment in the WIC program and breastfeeding duration, specific interrelated factors may affect breastfeeding duration among WIC women. The duration of breastfeeding was longer when mothers began breastfeeding in the hospital when mothers were foreign-born, and when a relative provided child care (Langellier et al., 2012; Shim et al., 2012; Ziol-Guest & Hernandez, 2010).

In addition, prior studies showed the association between professional and/or lay breastfeeding support and the increased occurrence of any breastfeeding up to six months (Haider et al., 2014; Hildebrand et al., 2014). For instance, breastfeeding support, including breastfeeding education, breast pump education, infant hunger cue knowledge, and lay support, increased the duration of any breastfeeding by an average of two to 17 weeks compared with no intervention (Haider et al., 2014; Olson et al., 2010).

Barriers to Breastfeeding among Low-income Women

The decision-making process for breastfeeding is multifactorial. Previous studies identified the following factors as barriers to breastfeeding among low-income women.

Lack of Breastfeeding Knowledge. A majority of women in the U.S. recognize breastfeeding as the optimal nutrition source for infants (Meek et al., 2022). Yet, many are unfamiliar with its specific advantages or the potential drawbacks of not breastfeeding. Many low-income mothers are unaware of the extensive health benefits of breastfeeding for their infants and themselves, including but not limited to enhanced immune function, protection against infectious diseases (e.g., diarrhea), reduced risks of chronic conditions (e.g., obesity, type 2 diabetes), and improved cognitive development for infants; in addition to reduced risk of breast and ovarian cancer, type 2 diabetes, and higher blood pressure for mothers (Doughty & Taylor, 2021; Hossain & Mahrshahi, 2022; McGowan & Bland, 2023; Moore et al., 2021; Tschiderer et al., 2022) For example, a study of a national sample of women enrolled in WIC reported that only 36% of participants thought that breastfeeding would protect the baby against diarrhea (McCann et al., 2007). Another study found that a low percentage of the U.S. adult population believed that breastfeeding protects mothers against breast cancer (23.9%), high blood pressure (15.5%), and type 2 diabetes (15.4%) (Boundy et al., 2023).

In addition, studies reveal that women's obstetricians rarely provide information about breastfeeding during prenatal visits (Pérez-Escamilla et al., 2023; Segura-Pérez et al., 2022). The American College of Obstetricians and Gynecologists (ACOG) identified a lack of breastfeeding education and support from doctors, either due to the cost of care for the patient or the physician's discomfort with providing breastfeeding advice, as one barrier to increasing breastfeeding knowledge and rates in the U.S. (ACOG, 2021). Moreover, studies show that mothers with problems with infants latching on or sucking within the first days and weeks following birth reported that their healthcare provider recommended formula supplementation without further information about breastfeeding techniques (Radzimirski & Callister, 2015, 2016; Taveras et al., 2004a, 2004b).

As a result, there is a widespread misconception regarding infant formula as equivalent to breastfeeding (Barbosa et al., 2017; Munblit et al., 2020). Also, many women believe formula provides better nutrition than breast milk, particularly when the mother's diet is not nutritionally adequate (Bonia et al., 2013). Some perceive infant formula as potentially more beneficial than breast milk because the marketing messages of infant formula highlight the addition of extra vitamins to aid in the development and growth of infants (Munblit et al., 2020). In fact, in-hospital formula supplementation for breastfed infants is often advised for several reasons (e.g., low milk supply, difficulty latching), even though the advice lacks robust evidence-based support or requires more thoughtful evaluation (Azad et al., 2018; Bookhart et al., 2022; Chantry et al., 2014).

Lack of Breastfeeding Skills. Women's breastfeeding knowledge is primarily acquired from healthcare providers (Hinsliff-Smith et al., 2014; Regan & Ball, 2013). Consequently,

many low-income women lack the necessary skills for breastfeeding practices, which is often associated with breastfeeding cessation (Hornsby et al., 2019).

The most common reasons breastfed infants receive formula supplementation are due to early lactation challenges, including nipple pain, engorgement, low milk supply, mastitis, plugged ducts, difficulty latching, and overactive let-downs (Azad et al., 2018; Bookhart et al., 2022; Cordero et al., 2019). Previous studies highlight how providing comprehensive breastfeeding information, techniques, and support systems, such as hospital practices aligned with the Baby-Friendly Hospital Initiative (BFHI), site-level breastfeeding supports, breast pump education, and hand-expressing techniques, improves breastfeeding rates and experiences among low-income women, particularly among WIC participants (Angeletti & Llossas, 2018; Cordero et al., 2019; Gleason et al., 2020; Nobari et al., 2017).

For instance, a study in Los Angeles County indicated that the BFHI-enhanced hospital practices significantly boosted exclusive breastfeeding rates at one and three months among WIC-participating families (Nobari et al., 2017). Another study revealed that WIC site-level supports, including access to peer counseling and lactation consultants, home visits, breast pump education, and limiting formula provision, significantly enhanced breastfeeding rates at two, six, and 12 months (Gleason et al., 2020).

Negative Attitudes Towards Breastfeeding. As mentioned above, the vast majority of published literature identifies problems with latching and the pain associated with breastfeeding as the most common barriers for women to initiate breastfeeding (U.S. Department of Health and Human Services. et al., 2011). Inadequate milk supply, both actual and perceived, is another barrier to breastfeeding initiation and duration (Francis et al., 2020; Sandhi et al., 2020). Breastfeeding mothers sometimes cannot determine how much milk their infants consume

compared to how much milk the infant had when bottle feeding, causing uncertainty among mothers (Ventura et al., 2021). Women's inability to overcome the common barriers has been found to foster negative attitudes toward breastfeeding, lack of confidence in their ability to breastfeed, and postpartum depression (Bartle & Harvey, 2017; Hamze et al., 2018; Sriraman & Kellams, 2016).

Moreover, recent studies emphasize embarrassment and stigma as barriers to breastfeeding, especially among low-income women in the U.S. (Houlihan et al., 2023; Kaufman et al., 2010; Kim et al., 2017; Zaikman & Houlihan, 2022) This is partly due to societal views on breastfeeding in public, where mothers often face disapproval or are asked to move to secluded areas when breastfeeding (Kaufman et al., 2010). The perception of breasts as sexual objects dominant in American culture further complicates this issue, making women uncomfortable breastfeeding in public (Zaikman & Houlihan, 2022). Additionally, the lack of images showing women breastfeeding in public impacts women's comfort and decisions regarding breastfeeding (Magnusson et al., 2017).

Lack of Breastfeeding Social Support. Previous research also identifies mothers' networks as a key factor in sharing their breastfeeding behaviors (Beggs et al., 2021; Lauer et al., 2019). Lack of role models – mothers, female relatives, and friends who breastfeed – is cited as one of the barriers to breastfeeding (Beggs et al., 2021). Family members and friends may actively discourage breastfeeding while openly questioning the benefits of the practice over formula feeding (Beggs et al., 2021). For example, breastfeeding during family gatherings has been reported as a challenge for some women from Black communities (Lutenbacher et al., 2016).

Furthermore, breastfeeding-related decisions have created conflict in women's relationships with significant others (Brown et al., 2014). Some women have noted they were pressured by their spouse/partner to cease breastfeeding, especially when women continued to breastfeed six months postpartum (Beggs et al., 2021; Burns et al., 2010). The literature suggests partners are central to women's breastfeeding practices (Beggs et al., 2021; Davidson & Ollerton, 2020).

Low Breastfeeding Self-efficacy. Women's breastfeeding self-efficacy has been identified as one of the strongest modifiable predictors of breastfeeding initiation and duration (Blyth et al., 2004; Dennis & Faux, 1999; Economou et al., 2021). A strong sense of breastfeeding self-efficacy results in a positive perception and success-promoting thought patterns about the mother's breastfeeding ability (Hamze et al., 2018; Rowe, 2015). In contrast, low self-efficacy is more likely to be associated with negative experiences, thought patterns, and emotional reactions (Economou et al., 2021).

For instance, a recent study found that low-income women, especially those with late-preterm and early-term infants, experience lower rates of exclusive breastfeeding, lower breastfeeding self-efficacy, and lower satisfaction with breastfeeding compared to mothers of full-term infants (Ahmed & Rojjanasrirat, 2021). The study suggests the need for ongoing professional breastfeeding support to improve low-income mothers' breastfeeding self-efficacy and outcomes. Moreover, a qualitative study on low-income African American women identified that women who succeeded in breastfeeding often had higher self-efficacy (Barbosa et al., 2017). In contrast, women who intended to formula feed from the start expressed fears and discomfort with breastfeeding, pointing toward the need for tailored interventions to increase social, institutional, and community support while also addressing self-efficacy (Barbosa et al., 2017).

Environmental Constraints to Breastfeeding. Breastfeeding, especially among low-income women, has numerous environmental constraints that impact the ability to start and continue breastfeeding. These constraints span workplace lactation programs (or the lack thereof), policies and practices, and navigating governmental assistance programs like WIC.

Recent studies highlight the lack of workplace lactation programs as a significant barrier to continued breastfeeding for working mothers (Dinour & Szaro, 2017; Ibarra-Ortega et al., 2020). Payton et al. (2019) highlight the importance of workplace lactation support for low-income breastfeeding mothers, particularly in the context of WIC service sites (Payton et al., 2019). WIC site-level supports, such as access to peer counselors and lactation consultants, are associated with increased breastfeeding duration (Angeletti & Llossas, 2018; Gleason et al., 2020). Lennon et al. (2017) demonstrated variability in lactation support among Milwaukee County businesses post-Affordable Care Act, emphasizing the need for enhanced support across all employers (Lennon et al., 2018). Ballou et al. (2017) described a successful collaboration between the City of Dallas WIC programs and local hospitals to improve breastfeeding rates through staff training (Ballou et al., 2017).

Moreover, challenges in navigating WIC and its impact on breastfeeding practices have been noted. For example, Chapman (2013) evaluated the impact of a policy change in the WIC program that aimed to promote and incentivize breastfeeding, finding that such policy changes can positively influence breastfeeding practices among low-income women (Chapman, 2013).

In sum, breastfeeding is not as habitual for low-income women as it is for high-income women living in the U.S. (Gonzalez-Nahm & Benjamin-Neelon, 2023). The lack of breastfeeding practices is attributed to a complex interplay of socioeconomic, cultural, and systematic barriers. Low-income women, particularly those participating in the WIC program,

often face significant obstacles that impede breastfeeding, including limited access to maternity leave, inadequate breastfeeding support and education, and social constraints that do not accommodate breastfeeding or milk expression (Rasmussen et al., 2016). Moreover, cultural and social norms within certain communities may not prioritize breastfeeding, further diminishing its prevalence among low-income groups (Rasmussen et al., 2016). Additionally, systematic issues within healthcare settings may fail to provide consistent, empowering support for breastfeeding, leaving many women without the necessary confidence and resources to breastfeed successfully (Rasmussen et al., 2016).

The Emergence and Role of Facebook Breastfeeding Support Groups

Online support communities, particularly those focused on health-related issues, have evolved significantly over the years, transitioning from email lists and forums to sophisticated, platform-based groups. Among these, FBSGs have emerged as a vital resource for new mothers seeking advice, emotional support, and practical tips on breastfeeding. These groups underscore the broader trend of leveraging social media for peer support and health education, especially in domains that benefit from shared personal experiences and advice.

FBSGs have become increasingly popular due to their accessibility and the immediacy of support they offer. They serve as safe havens where mothers can share their experiences, seek advice, and find solace in the stories of others navigating similar challenges. These groups range from general support to more specialized, such as breastfeeding preemies, dealing with specific health conditions, balancing breastfeeding with work, or WIC communities.

Facebook groups. Facebook groups are online communities within the Facebook platform where users can gather, connect, and participate in discussions around shared interests, topics, or goals. Facebook groups may be managed by administrators or led collectively by peers

and can be tailored to users' geographic location, racial affinity, age, gender identity, and other characteristics (Alianmoghammad et al., 2019; Robinson, Lauckner, et al., 2019; Skelton et al., 2020; Stollefson et al., 2020). Facebook groups offer two privacy settings, public and private. Public groups are searchable, and all their content is publicly visible. On the other hand, private groups require initial admission into the groups and member log-in to access the content, although they can be located through internet searches.

Moreover, *Facebook Group Insights* provides data and analytics about the performance and engagement of a Facebook group (Houk & Thornhill, 2013). These Insights are available to administrators of groups larger than 50 members and can help them understand how members interact with the group, which content resonates the most, and how the group is growing over time. The key features of *Facebook Group Insights* include but are not limited to the Members section, post-performance, and engagement metrics.

The Members section includes specific metrics such as the overall number of members in the FBSG (total users) and the total number of unique users who engage in the FBSG daily (daily active users). A larger user base in FBSGs is crucial to a group's success, as more individuals can access and benefit from the support, resources, and information shared within the group.

Post-performance refers to the popular days and times to post. The most popular days are the average number of times members post, react, or comment on a given day in the specified date range, and popular times are the average number of times members post, react, or comment at a given hour of the day in the specified date range. Analyzing popular days and times allows administrators to optimize their group's engagement, content strategy, and overall members' experience.

Engagement metrics provide insights into the number of posts and the views, reactions, and comments per post. The number of views indicates how many people have seen a post. Higher view counts suggest greater visibility and exposure of the posts. Reactions represent the emotional response of users to the posted content. Facebook offers a range of reaction options, such as like, love, care, haha, wow, sad, and angry, allowing users to express their feelings towards a post. Comments reflect the level of engagement and interaction with the posted content. Comments provide an opportunity for direct interaction with the group audience and can be a source of feedback, insights, and community building.

Facebook Breastfeeding Support Group Participation Benefits. FBSGs are a promising internet-based channel to disseminate, promote, educate, and provide breastfeeding support. Given their versatility and popularity, recent studies have explored users' perceptions, examined the types of support provided through FBSGs, and examined their effects on breastfeeding outcomes (Alianmoghaddam et al., 2019; Bridges, 2016; Bridges et al., 2018; Jackson & Hallam, 2021; Moon & Woo, 2021; Moon et al., 2019; Niela-Vilén et al., 2015; Robinson, Davis, et al., 2019; Robinson, Lauckner, et al., 2019; Skelton et al., 2020; Skelton et al., 2018; Wilson, 2020).

Jackson and Hallam (2021) found that mothers experienced a sense of empowerment for themselves and others through their participation in FBSGs and changed their perceptions of social stigma associated with breastfeeding to pride. Similarly, Niela-Vilén (2015) found that mothers felt a sense of empowerment and a good and accessible source of information and support from their participation in FBSGs after hospital discharge. Additionally, qualitative studies found that FBSGs provide emotional and informational breastfeeding support and form a virtual community to normalize and empower breastfeeding (Alianmoghaddam et al., 2019;

Bridges, 2016; Skelton et al., 2018). Moreover, Robinson, Davis, et al. (2019) suggest that FBSGs improved participants' confidence and prolonged initial breastfeeding duration goals. FBSG participants have also reported a higher level of breastfeeding support from their FBSG than offline breastfeeding support groups (Robinson, Lauckner, et al., 2019). Furthermore, breastfeeding mothers have reported that the highest amount of breastfeeding support was received from FBSGs compared to other sources (e.g., spouse/partner, mother, healthcare providers, and peers). FBSG participation was also significantly correlated with intended breastfeeding duration (Robinson, Lauckner, et al., 2019).

Facebook Breastfeeding Support Group Best Practices. Successful FBSGs implement various best practices that significantly enhance the support and information to breastfeeding mothers. These groups are characterized by effective moderation and clear guidelines to ensure that discussions remain respectful, misinformation is addressed, and the environment is supportive (Morse & Brown, 2022). Inclusivity is another key component, with groups encouraging diverse experiences and perspectives, fostering a welcoming environment for all mothers, regardless of their breastfeeding journey (Bridges, 2016). In addition, the involvement of experts, such as lactation consultants and healthcare providers, adds authoritative advice and support for complex issues and is highly valued by group members (Morse & Brown, 2021, 2022). Furthermore, providing a wide range of resources, from informational articles to videos, supports mothers in their breastfeeding goals, contributing to a positive and empowering experience (Robinson, Lauckner, et al., 2019). Together, these practices create a supportive, informative, and inclusive community that encourages and facilitates successful breastfeeding experiences for mothers.

Gaps in the Literature

The current breastfeeding situation in the U.S. calls for improving public health interventions in promoting and supporting breastfeeding among low-income women, particularly those participating in the WIC program. Using FBSGs as a tool has had several positive impacts on improving breastfeeding attitudes and behaviors among women. Following the elucidation of currently known best practices within FBSGs, there remains a gap in the optimal engagement and growth of FBSGs and their influence on low-income women's breastfeeding attitudes and behaviors, particularly those participating in the WIC program.

Moreover, research focused on the specific needs of WIC participants using FBSGs is warranted. Existing research calls for a deeper exploration into the factors that motivate WIC participants to engage with FBSGs and identify the specific information and resources required to initiate or continue their breastfeeding journey effectively. In addition, understanding the experiences of low-income mothers and moderators (henceforward: administrators) in FBSGs is crucial for enhancing support for WIC participants. The knowledge gained by administrators may enrich our understanding of the dynamics within FBSGs, enabling the development of tailored support strategies for designing and developing future FBSGs. Moreover, empirical research investigating the influence of the level of FBSG participation on breastfeeding practices, specifically duration, through mediating variables such as breastfeeding social support and self-efficacy among WIC participants will enrich our understanding of the psychological mechanisms behind FBSGs interventions.

Theories

The theories that will be used to understand and address the gaps identified in the current literature are presented in the following section.

Uses and Gratifications Theory

The Uses and Gratification Theory (U&G) emphasizes the proactive role of audiences in selecting media to fulfill specific needs. Contrary to theories focusing on media's effects on individuals and societies, this approach underscores the consumer's agency in media engagement. It posits that individuals actively seek media sources for various purposes, including information acquisition, personal identity affirmation, social integration, entertainment, and escapism. This theory illuminates how media serves as a platform for information dissemination and a tool for personal reflection, community connection, and leisure, allowing individuals to navigate and interpret their social reality.

Moreover, in this digital age, the theory adapts to encompass new forms of media interaction, such as content creation and online community participation, reflecting the evolving landscape of media consumption. Despite critiques concerning its focus on individual motivations over societal impacts and the challenges of measuring subjective gratifications, U&G remains pivotal in understanding the dynamic relationship between media and its audiences, highlighting the varied and complex motivations behind media use.

Integrated Behavioral Model Theory

The Integrated Behavioral Model (IBM) represents a significant evolution in the theoretical understanding of behavioral determinants, offering a comprehensive framework that synthesizes elements from several precursor theories, including the theory of Planned Behavior (TPB) and the Theory of Reasoned Action (TRA), among others. Central to IBM is the premise that human behaviors are the result of a complex interplay of various factors rather than the outcome of isolated influences. This model serves as a robust foundation for analyzing and

predicting human behavior, providing invaluable insights for developing and evaluating interventions aimed at behavior change.

At the core of the IBM are several key constructs that interact to influence an individual's likelihood of engaging in a specific behavior. First, attitudes towards the behavior play a critical role; this encompasses an individual's positive or negative evaluations of performing the behavior based on the anticipated outcomes. Theorists have described attitude as being experiential and instrumental. Experiential attitude is the individual's emotional response to the idea of performing a recommended behavior. Instrumental attitude is cognitively based and determined by beliefs about outcomes of behavioral performance, as in the TRA/TPB. The model posits that more favorable attitudes towards the behavior increase the propensity for its enactment.

Perceived norms constitute another pivotal element, encapsulating the perceived social pressure to perform or abstain from the behavior. This is subdivided into injunctive norms (beliefs about what significant others think one should do) and descriptive norms (beliefs about what significant others are actually doing), which influence behavioral intentions.

Personal agency, encompassing self-efficacy (the confidence in one's ability to perform the behavior under various circumstances) and perceived control (the belief in one's control over the performance of the behavior), is another crucial determinant. This aspect of IBM underscored the importance of an individual's belief in their capability to execute the behavior successfully and their perceived autonomy in doing so.

The construct of intention is a central mediator in IBM, representing the individual's motivational readiness to perform the behavior. It reflects the degree of effort an individual is

prepared to invest and is influenced by attitudes, perceived norms, and personal agency.

Intention is posited to be the most immediate antecedent of behavior within the model.

Moreover, IBM introduces knowledge and skills as key components to perform the behavior. This includes the physical ability to enact the behavior and the confidence in one's skillfulness. Lastly, environmental constraints are recognized within IBM as external factors that can facilitate or impede behavior, regardless of the individual's intention or capabilities. This highlights the role of the broader context in enabling or restricting behavior, underscoring the importance of considering environmental factors in behavior change interventions.

The IBM model does not prescribe a linear or hierarchical order in which its constructs must be applied. Instead, IBM posits that behavior is influenced by a set of core determinants, directly affecting whether the behavior is performed. The flexible model allows adaptability to the specific needs and circumstances of the target behavior and population.

Study Aims

Recognizing the gaps in the literature, this dissertation explores the effectiveness of FBSGs for low-income women, particularly WIC participants. The first proposed theory, U&G, guides the first paper to (a) illustrate the growth of FBSGs for a better understanding of the process, (b) identify the motivations, formats, and sources of the posts, and (c) examine the relationships between the post characteristics and user response behaviors, such as the number of views, reactions, and comments. The research questions (RQs) for the first paper are as follows:

RQ 1.1: How many users and daily active users did a Facebook breastfeeding support group for low-income women accrue?

RQ 1.2: What were the most popular days and times for posting in a Facebook breastfeeding support group for low-income women?

RQ 1.3: How many posts were made in a Facebook breastfeeding support group for low-income women, and how many user views, reactions, and comments did they generate?

RQ 1.4: What were the motivations, formats, and sources of posts in a Facebook breastfeeding support group for low-income women, and were the motivations and formats different by the source?

RQ 1.5: Were specific motivations, formats, and sources of the posts on a Facebook breastfeeding support group for low-income women associated with the number of user views, reactions, and comments?

The second proposed theory, the IBM, guides this dissertation's second and third papers. The second paper investigates the FBSG's influence on the IBM constructs when providing breastfeeding information and support among low-income women and incorporating administrators' experiences and perspectives.

The third paper aims to shed light on the association between the level of FBSG participation and breastfeeding duration through mediating variables such as breastfeeding social support and self-efficacy. The RQ for the third paper is as follows:

RQ 3.1: What are the direct and indirect effects of FBSG participation on breastfeeding duration through breastfeeding social support and self-efficacy?

This dissertation explores the effectiveness of FBSGs through three manuscripts that collectively aim to enhance breastfeeding support strategies for low-income women, particularly WIC participants, thereby filling the identified gaps in the literature.

CHAPTER II

Methods

To answer the research questions that emerged from a comprehensive review of the current literature on breastfeeding support among low-income women and the role of FBSGs in facilitating this support, this dissertation implemented a multi-phase research design, beginning with content analysis, followed by qualitative focus groups with participants and administrators, and concluding with a cross-sectional survey of Wisconsin WIC FBSG participants. This approach allows for a comprehensive, in-depth exploration of the study aims, leveraging the strengths of each method to provide an overview of the effectiveness of FBSGs among WIC participants.

Study Design

The research methods applied to the three papers of this dissertation are observational studies. Observational studies aim to identify and analyze the participants' characteristics, behaviors, and outcomes without manipulating the study environment or applying treatments. Hence, as an investigator, one does not intervene but rather simply "observe" and assess the strength of the relationship between an independent and dependent variable. These methods allow researchers to collect data in a natural setting while preserving the real-world context.

Paper 1: Content Analysis

This paper applies a content analysis research technique to systematically analyze communication content in one of the five Wisconsin WIC FBSGs, the Milwaukee County FBSG (See details below, p. 31-32). The content analysis of the FBSG posts was conducted to identify the posts' content motivations, formats, and sources. In addition, the *Facebook Group Insights*

data were matched to each post to examine the relationships between post characteristics and the number of views, reactions, and comments.

Paper 2: Qualitative Focus Groups

This paper uses data from two focus groups of participants and one focus group of administrators to discuss and explore their experiences and perspectives using any of the five Wisconsin WIC FBSGs to access and provide breastfeeding information and support. This method allows for in-depth discussion and offers rich, detailed data that can reveal insights into participants' and administrators' experiences, motivations, and behaviors toward breastfeeding. The focus group questions for participants and administrators were designed by the Wisconsin WIC Program, with the U.S. Department of Agriculture Food and Nutrition Services (USDA-FNS) funding and in partnership with the University of Nevada, Reno (UNR). The focus groups were conducted by Wisconsin WIC staff.

Paper 3: Cross-sectional Survey

A cross-sectional online survey was used to collect data from WIC women participating in any of the five Wisconsin WIC FBSGs. This design assessed the association between the level of FBSG participation and breastfeeding duration through mediating variables such as breastfeeding social support and self-efficacy. The Wisconsin WIC Program designed the online survey with USDA-FNS funding and in partnership with the UNR.

The sequential use of content analysis, focus groups, and cross-sectional surveys employs a mixed-methods approach that progressively builds understanding, depth, and breadth in the research on the influence of FBSGs. Each phase informs and refines the subsequent phase, allowing for a thorough investigation that encompasses the macro and micro-level dynamics of

FBSG participation and its influence on breastfeeding attitudes, perceived norms, self-efficacy, support, and outcomes. Further details of the methods for each paper are provided in Chapter III.

Setting

The three papers constituting this dissertation used data from the Wisconsin WIC Program. In 2019, USDA-FNS entered a cooperative agreement with the UNR to provide technical support to multiple states and at least one Indian Tribal organization for implementing a breastfeeding support campaign, “Learn Together, Grow Together” (henceforward “the Campaign), targeting WIC participants. Subsequently, the project team at UNR issued a request for proposals, competitively evaluated all submitted proposals, and selected seven states and one Indian Tribal Organization as the sites to carry out the campaign. Wisconsin was one of the chosen states, along with Georgia, Massachusetts, Nevada, North Dakota, Pennsylvania, and the Chickasaw Nation.

The Campaign had standard elements – a social media campaign and Buddy program – implemented on all sites. In addition, the Campaign required each site to have at least one site-specific campaign element to address their unique needs for breastfeeding support. Wisconsin WIC chose online support groups as their state-specific element and decided to use Facebook as the social media platform, given its popularity among the target population.

The FBSG intervention focused on general breastfeeding support, including increasing knowledge, skills, attitudes, and self-efficacy and raising awareness of WIC services among participants and staff. The Campaign’s social media content was posted on five Wisconsin WIC FBSGs five days a week for 12 months. The Wisconsin WIC FBSGs were activated in the (1) Northern, (2) Northeastern, (3) Western, (4) Southern, and (5) Milwaukee County/Southeastern,

with one FBSG per region. The geographical locations of Wisconsin WIC regions are shown in Figure 1.

Figure 1

Geographical Locations of Wisconsin WIC Regions



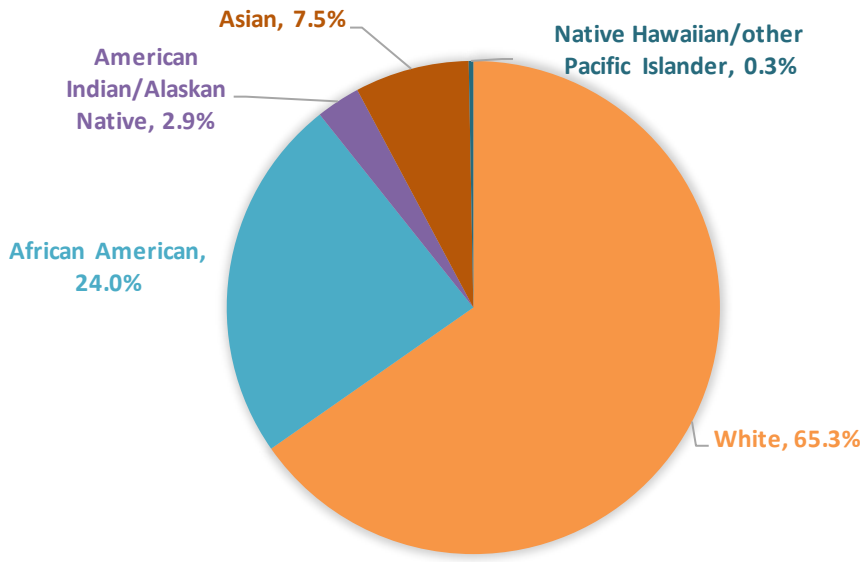
Note: This figure demonstrates the Wisconsin WIC regions.

Participants

The Wisconsin WIC Program comprises 67 local WIC agencies: 50 local health departments, 13 non-profits, and four tribal agencies. The number of caseloads varies from 65 to 7,489 participants per agency. Most Wisconsin WIC participants are white, followed by African American and Asian participants (See Figure 2). Twenty-five percent of all participants identify as Hispanic. In addition, about 32% of all Wisconsin WIC participants live in Milwaukee County. Of all African American participants in WIC, 82% live in Milwaukee.

Figure 2

Wisconsin WIC Population by Race



Note: This figure demonstrates the Wisconsin WIC participants' demographics.

Ethics Approval

The Wisconsin Department of Health Services did not require an IRB process for this grant's activities. In preparation for the Campaign's launch on August 1, 2020, all staff involved with the Campaign completed the virtual training workshop preparation activities and attended the virtual WIC Breastfeeding Support Campaign training coordinated by UNR in May 2020. On the UNR side, the data collection activities associated with all Campaign components received an exemption from the UNR Office of Research Integrity.

CHAPTER III

Manuscripts

Paper 1 – Growth and Engagement Patterns of a Facebook Breastfeeding Support Group: A Case Study Using Content Analysis and Group Insights

Abstract

Facebook support groups can catalyze the way mothers receive breastfeeding information and social support. However, the present literature lacks practical insights about creating and managing FBSGs that meet breastfeeding mothers' needs and encourage their active participation. Therefore, this study analyzed *Facebook Group Insights* data and conducted a systematic content analysis of a FBSG among WIC participants to illustrate the growth patterns, identify the post characteristics (motivations, formats, and sources), and explore the relationship between post characteristics and user response behaviors (number of views, reactions, and comments). The metrics of total users and average daily active users were found essential to monitor a group's reach and real-time engagement. Posts containing breastfeeding-related questions and experiences garnered more views and comments from participants. In comparison, posts with videos received fewer views and reactions. The findings have implications for developing future health communication campaigns promoting breastfeeding among low-income women.

Introduction

Women of reproductive age (15–44 years) currently comprise 20% of the U.S. population (Dimes, 2022). Comparably, the largest female social media user age group, which constitutes 43% of Facebook's active users, falls within the 25–34 age range (Barnhart, 2022). During pregnancy and lactation, women use social media as their primary source of information to

engage in information-seeking, decision-making, and lifestyle changes (Skouteris & Savaglio, 2021; Tomfohrde & Reinke, 2016).

Social media platforms like Facebook and Twitter have been used in the maternal and child health field to promote and support breastfeeding (Pérez-Escamilla, 2012, 2020; Wagg et al., 2018). A qualitative study of pregnant women who intended to breastfeed indicated that social media have the potential to positively influence breastfeeding-related attitudes, knowledge, and behaviors (Skelton et al., 2018). Similarly, a repeated-measures, longitudinal, mixed-method study found that social media breastfeeding support groups directly improved breastfeeding confidence, knowledge, and attitudes (Wilson, 2020). A content analysis of breastfeeding promotion messages on Twitter revealed that 82% of users who posted breastfeeding-related hashtags were part of an interconnected breastfeeding social network (Moukarzel et al., 2020). The findings of these studies suggest that social media can catalyze how breastfeeding mothers receive health information and positively impact their breastfeeding-related perceptions and behaviors. Nonetheless, if the support network inadvertently shames individuals, it could negatively influence their decision to initiate or continue breastfeeding and reduce their reliance on their network support (Carlin et al., 2019; Skelton et al., 2018).

Therefore, there is preliminary evidence that the interactivity and reciprocity of FBSGs can provide breastfeeding social support, including factual information from news sources and professionals, encouragement and empowerment messages posted by peer users, and network support as quantified by the number of people who take part in FBSGs by liking and commenting on posts (de Souza et al., 2023). Although this study focused on experiences among low-income women (participants who live in households with gross incomes at or below 185 percent of the federal poverty income level, including all of the members of the household), we

acknowledge the terms ‘pregnant people’ and ‘chestfeeding’ to honor the inclusivity of gender identities (García-Acosta et al., 2019).

Due to Facebook’s status as the most popular social media platform for private groups and its multiple functionalities, including interpersonal communication, social connection, and information sharing and seeking, FBSGs have proliferated during the last decade (Bridges, 2016; Bridges et al., 2018; Morse & Brown, 2021; Wilson, 2020). Nonetheless, the present literature has many gaps, including but not limited to how FBSGs grow over time, how the groups meet the needs of participants, specifically low-income participants in the WIC program, and whether and how users respond differently to wall posts—the primary conduit of communication on the platform—based on their features such as formats and sources.

Theoretical Framework. The U&G assumes that users are active media consumers and choose what to pay attention to (Katz et al., 1974). U&G theory proposes that people choose and use media based on their needs, wants, or expectations (Rubin, 2009). U&G also proposes that when users feel a higher level of utility for using a communication medium, they continue to use it, for it has more advantages in satisfying their needs than other available media (Rubin, 2002). This assumption of an active audience provides a solid foundation for studying a medium designed for active use and known for its interactivity.

Through Facebook groups, users can satisfy their various needs in one central location within a network of similar others. The rising popularity of FBSGs has prompted researchers to learn about breastfeeding women’s motivations behind their use (Anderson, 2011; Ishii, 2008; Kisekka et al., 2014; Morse & Brown, 2021; Regan & Brown, 2019; Wagg et al., 2019). The need for information is one of the primary motivations for pregnant and breastfeeding people to engage with private FBSGs (Alianmoghaddam et al., 2019; Bridges, 2016; Wagg et al., 2019).

Providing affirmation or emotional support is another motivation for joining FBSGs, as individuals feel empowered by participating in social media breastfeeding support groups and are willing to support others in their breastfeeding/chestfeeding journey (Alianmoghaddam et al., 2019; Moon & Woo, 2021). Moreover, individuals find comfort and belonging from shared breastfeeding experiences through FBSGs (Clapton-Caputo et al., 2021; Moon & Woo, 2021; Robinson, Lauckner, et al., 2019). Furthermore, Bridges et al. (2018) analyzed the content of 15 closed FBSGs and identified that 21% of wall posts were questions, and 44% were specific about breastfeeding questions. Prior studies also suggest that pregnant and breastfeeding women perceived FBSGs as a virtual community with easy access and resources provided by trustworthy sources who had actual breastfeeding experiences (Moon & Woo, 2021; Skelton et al., 2018; Wagg et al., 2019). Nevertheless, the association between post motivations and user response behaviors has not been closely examined.

Post formats are another crucial characteristic of engaging FBSG users (Kim & Yang, 2017). Facebook groups provide various formats to facilitate engagement by posting texts, hyperlinks, images, and videos. For instance, a study on factors influencing information sharing using FBSGs suggests that mothers sharing professional breastfeeding pictures (e.g., sharing a picture with information/knowledge about breastfeeding) receive the greatest number of likes (Wagg et al., 2019). However, further research is needed to identify which post formats increase FBSG user engagement.

Furthermore, previous research indicates that post sources--administrators vis-a-vis users-- may influence user engagement in Facebook groups (Changrani et al., 2008; Haller et al., 2018; Klemm, 2012; Lepore et al., 2014). For example, patients with rare tumors reported a better understanding of their diseases, lessened anxiety, and higher appreciation of the group when

their Facebook support groups included pathologists who actively interacted with patients than when their support groups did not include the experts (Haller et al., 2018). Another study that compared administrator-led and peer-led online breast cancer support groups showed that groups led by expert administrators read and posted more messages than peer-led groups, indicating the positive impact of expert administrators in online support groups (Klemm, 2012). Still, the associations between post sources and user response behaviors have yet to be examined in FBSGs for low-income women, particularly WIC participants.

Study Aims and Research Questions. This study aims to address these gaps by (a) illustrating the growth of FBSG for a better understanding of the process, (b) identifying the motivations, formats, and sources of the posts, and (c) examining the relationships between the post characteristics and user response behaviors, such as the number of views, reactions, and comments.

RQ 1.1: How many users and daily active users did a Facebook breastfeeding support group for low-income women accrue?

RQ 1.2: What were the most popular days and times for posting in a Facebook breastfeeding support group for low-income women?

RQ 1.3: How many posts were made in a Facebook breastfeeding support group for low-income women, and how many user views, reactions, and comments did they generate?

RQ 1.4: What were the motivations, formats, and sources of posts in a Facebook breastfeeding support group for low-income women, and were the motivations and formats different by the source?

RQ5: Were specific motivations, formats, and sources of the posts on a Facebook breastfeeding support group for low-income women associated with the number of user views, reactions, and comments?

Methods

First, the *Facebook Group Insights* group-level data were used to quantify the number of users and active users, the days and times when users are the most active in the group, and the total number of posts for the selected period. Second, a systematic content analysis of the FBSG posts was conducted to identify the posts' content motivations, formats, and sources. Third, the *Facebook Group Insights* data were matched to each post to examine the relationships between post characteristics and the number of views, reactions, and comments.

Milwaukee County Facebook Breastfeeding Support Group. The WIC program launched the WIC Breastfeeding Support *Learn Together. Grow Together.* campaign to promote breastfeeding and build a supportive breastfeeding environment as part of the nutrition education offered to WIC program participants. Wisconsin WIC participated in the Campaign and proposed breastfeeding support groups on Facebook as its state-specific intervention. They set up five FBSGs spread across the state, and the Milwaukee County FBSG was the largest among them, prioritizing pregnant and breastfeeding WIC participants in Milwaukee County. Eligibility was confirmed through onboarding questions (i.e., verifying Wisconsin WIC participation and pregnant or breastfeeding status), and only approved members could see group content and members. The group was run by two administrators, one lactation consultant, and one WIC breastfeeding peer counselor. Due to a substantial percentage of the FBSG participants who spoke Spanish only, one of the group administrators was bilingual in English and Spanish, and all posts posted by administrators were in both languages. In addition to making the posts, the

administrators monitored the group conversations and answered participants' questions. The Milwaukee County FBSG was up and running in January 2021, but the *Facebook Group Insights* data became available starting in February 2021 because it took a month for the group to meet the 50-member threshold to receive the data from Facebook.

Facebook Group Insights. Every month, the total number of users and average daily active users, the total number of posts, views, reactions, and comments to each post, and the most popular days and times for the entire group were exported and saved from *Facebook Group Insights*.

Content Analysis: Unit of Analysis. The primary unit of analysis was each post posted on the FBSG wall by administrators and users. User responses attached to the posts (i.e., number of views, reactions, and comments) were tallied. All posts made between February 1, 2021 and July 31, 2021 and associated user responses were analyzed.

Content Analysis: Coding Procedure. The posts collected from the Milwaukee County FBSG were analyzed to identify their motivations. First, the researchers became familiarized with the Milwaukee County FBSG by reading and re-reading the posts and comments on the FBSG wall. Second, the primary researcher developed a coding scheme and tested it by coding a sample of posts. Third, a second researcher scrutinized the codebook to ensure the coding instructions were clear and straightforward, leaving little room for interpretation (Neuendorf, 2017).

During the first coding round, the first month of posts was analyzed by two researchers using the coding scheme. The coding results revealed some disagreements, which led to a discussion between the coders and further refinement of the coding scheme. In the second round of coding involving the second month of posts, the two coders achieved the desired level of

intercoder-reliability (Krippendorff's alpha = .94 ~ 1.0). Once intercoder reliability was established, the posts were analyzed using the same coding scheme and decision rules. See Appendix A, Table A1, for the coding categories and examples.

Measures

Post motivations. The posts were examined to determine whether it was made to 1) provide information, 2) provide affirmation or emotional support, 3) share experiences, 4) ask questions, and 5) direct people to resources. Each post was assessed on all five motivations and coded "1" if "yes" and "0" if "no." One post could contain multiple motivations or none.

Post formats. Each post was examined for the presence of these format elements: text, hyperlink, image, and video. Each post was assessed on all four formats and coded "1" if "yes" and "0" if "no." One post could contain more than one format.

Post sources. Each post was assigned "1" if made by an administrator and "0" if made by a user. One post could be attributed to only one source.

User response behaviors. *Facebook Group Insights* included user responses to each post on the group wall. For each post, the metrics for three user response behaviors were generated: the number of views, the number of reactions expressed in emojis (e.g., "like," "love," "haha," "wow," "sad," and "angry"), and the number of comments.

Data Analysis. The sample was 194 posts that were posted between February 1, 2021, and July 31, 2021, on the Milwaukee County FBSG wall. Posts were excluded from the analytic sample if post content was deleted after posting ($n = 3$). Due to missing data from the *Facebook Group Insights* (i.e., number of views), the analyses ranged from 174 to 191 posts. Frequencies and Pearson's chi-square tests were conducted for categorical variables. Also differences in posts' motivations and formats by the source were assessed with Pearson chi-square tests. Three

separate multiple linear regression analyses were used to determine the association between the posts' motivations, formats, and sources with the number of user views, reactions, and comments. The dependent variables for each multiple regression analysis were the number of user views, reactions, and comments. Because the number of user reactions and the number of user comments variables exhibited a skewed distribution, the values of these variables were transformed using the logarithmic and the square root method, respectively, before the statistical analyses (Kim & Yang, 2017). All analyses were conducted using IBM SPSS Statistics Version 29.0.0.0 (241).

Results

The total number of users of the group increased from 104 to 222, with 118 Wisconsin WIC participants joining the group during six months, representing a growth of 113%. During the same period, the number of active users also increased from 39 to 124, representing a growth of 218%. See Figure 3 for the monthly numbers of total users and average active users on the FBSG.

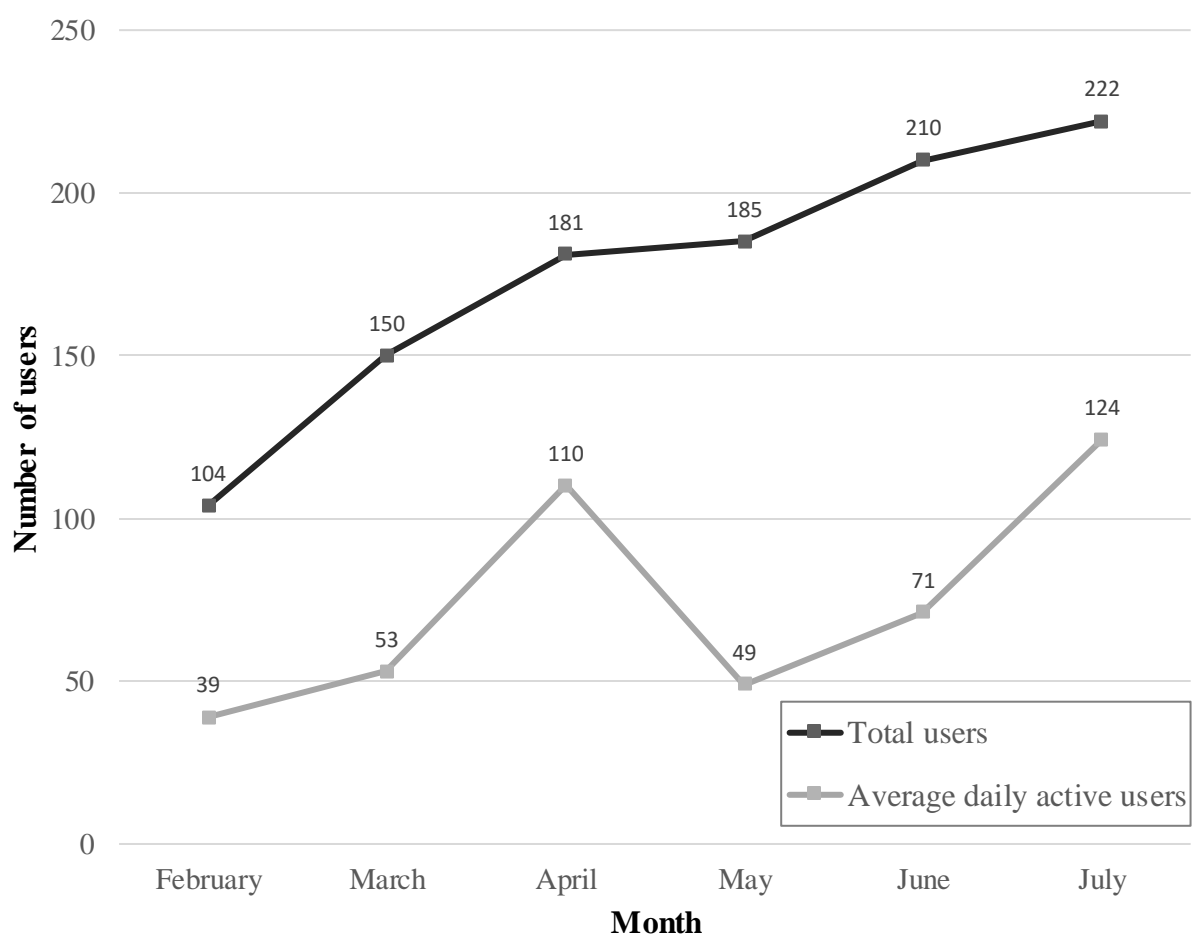
The analysis revealed that the most popular days for posting in this group were Mondays and Thursdays. The most popular times were Mondays between 10 a.m. and 12 p.m. and Thursdays between 12 p.m. and 2 p.m.

Over the course of six months, a cumulative 194 posts were made. The individual monthly post counts were as follows: 28 posts in February, 32 posts in March, 29 posts in April, 25 posts in May, 41 posts in June, and 39 posts in July. The total number of views generated by all posts was 5230, with an average of 76.9 views per post ($SD = 26.33$). The total number of reactions generated by all posts was 787, with an average of 4.1 reactions per post ($SD = 2.65$). The reactions expressed by emojis were as follows: like ($n = 155, 79.9\%$), love ($n = 122, 62.9\%$),

care ($n = 14, 7.2\%$), laugh ($n = 12, 6.2\%$), wow ($n = 2, 1.0\%$), sad ($n = 2, 1.0\%$), and angry ($n = 0, 0.0\%$). The total number of comments generated by all posts was 487, with an average of 2.5 comments per post ($SD = 3.31$).

Figure 3

The Number of Total Users and Average Daily Active Users Each Month in Milwaukee County WIC Facebook Breastfeeding Support Group, February 2021 – July 2021



Note: This figure demonstrates the monthly numbers of total users and average active users on the FBSG.

In the analyzed dataset, 167 posts (87.4%) exhibited one or more motivations, whereas 24 posts (12.5%) had none of the examined motivations and were primarily announcements

regarding the FBSG rules and welcome posts to new members. The most posted motivation was asking questions (56.0%), and the least was sharing experiences (13.1%). Similarly, all posts were examined for four format elements; 84.5% had more than one format, and 14% had only one format. Nearly all posts included text (99.0%), and a few included videos (17.8%). Administrators posted 148 posts (77.5%), and users posted 43 posts (22.5%).

The results show several significant differences between sources (administrators versus users) regarding posting motivations and format. Compared to users, administrators were significantly more likely to post posts providing information, emotional support, and directing people to resources. Moreover, administrators were significantly more likely to post with hyperlinks and images than users. See Table 1 for detailed statistics.

Table 1

The Number of Posts by Motivation, Format, and Source and the Differences Between the Posts Made by Administrators and Users

	Sources			<i>p</i> -value
	Administrators	Users	Total	
	<i>n</i> (% ^a ; % ^b)	<i>n</i> (% ^a ; % ^c)	<i>N</i> (% ^d)	
Posts	148 (77.5; 100)	43 (22.5; 100)	191 ^e (100)	< .001
Motivations				
Provide information	81 (94.2; 54.7)	05 (05.8; 11.6)	86 (45.0)	< .001
Provide affirmation/emotional support	33 (91.7; 22.3)	03 (08.3; 07.0)	36 (18.8)	0.02
Share experiences	17 (68.0; 11.5)	08 (32.0; 18.6)	25 (13.1)	0.22
Ask questions	83 (77.6; 56.1)	24 (22.4; 55.8)	107 (56.0)	0.97
Direct people to resources	59 (98.3; 39.9)	01 (01.7; 02.3)	60 (31.4)	< .001
Formats				
Text	148 (78.3; 100)	41 (21.7; 95.3)	189 (99.0)	0.05
Hyperlink	86 (90.5; 58.1)	09 (09.5; 20.9)	95 (49.7)	< .001
Image	116 (87.2; 78.4)	17 (12.8; 39.5)	133 (69.6)	< .001
Video	28 (82.4; 18.9)	06 (17.6; 14.0)	34 (17.8)	0.45

^a The denominator is the number of total posts (administrators and users combined) with the particular motivation or format.

^b The denominator is the number of total posts made by administrators ($n = 148$).

^c The denominator is the number of total posts made by users ($n = 43$).

^d The denominator is the number of total posts ($N = 191$).

^e Three posts from users were deleted and, therefore, excluded from the analyses.

Table 2 shows the association between the motivations, formats, and sources of the posts and user response behaviors. The first model in which posts' motivations, formats, and sources predicted the number of views was significant, $R^2 = .24$, $F(10, 163) = 5.03$, $p < .001$. Posts with the motivations of asking questions ($\beta = .17$, $t = 2.37$, $p = .02$) and sharing experiences ($\beta = .18$, $t = 2.57$, $p = .01$) were viewed more.

Table 2

Predictors of Motivations, Formats, and Sources Toward the Number of Views, Reactions, and Comments

	Views	Reactions	Comments
	β	β	β
Motivations			
Provide information	-.07	-.01	-.22**
Provide affirmation/emotional support	.08	-.06	-.09
Ask questions	.17*	-.09	.25***
Share experiences	.18**	-.01	.00
Direct people to resources	-.12	.03	.02
Formats			
Text	.11	.03	-.03
Hyperlink	.13	-.22	-.13
Image	.01	.33***	-.20**
Video	-.25**	.27**	-.10
Source			
Administrator or user	-.28***	.04	-.13
R^2 / Adjusted R^2	.24/ .19	.12/ .07	.33/ .29
F	5.03***	2.50**	8.73***
N	174	191	191

Note: β (standardized coefficient beta); F (F-value statistics); N (number of observations);

* $p < .05$; ** $p < .01$; *** $p < .001$

On the other hand, posts containing a video ($\beta = -.25, t = -3.04, p = .01$) received fewer views. Posts from administrators received fewer views ($\beta = -.28, t = -3.55, p < .001$) than posts from users. The second model in which posts' motivations, formats, and sources predicted the number of reactions ($M = 0, SD = .97$) was significant, $R^2 = .12, F(10,180) = 2.50, p < .01$. The posts containing images ($\beta = .33, t = 3.61, p < .001$) and videos ($\beta = .27, t = 3.29, p = .001$) received more reactions. The third model in which posts' motivations, formats, and sources predicted the number of comments ($M = .39, SD = .60$) was significant, $R^2 = .33, F(10,180) = 8.73, p < .001$. The posts with motivations of asking questions ($\beta = .25, t = 3.80, p < .001$) were commented more, while the posts providing information ($\beta = -.22, t = -2.68, p = .01$) received fewer comments. Additionally, posts containing images ($\beta = -.20, t = -2.47, p = .02$) received fewer comments.

Discussion

This study examined the number of users, identified the post characteristics, and explored the relationship between post characteristics and user response behaviors of the Wisconsin Milwaukee County WIC FBSG between February 1, 2021 and July 31, 2021. A steady growth in total users of the FBSG was observed over six months. The growth was particularly strong in the first two months, at a 44% increase. This finding may be explained by the group's ability to fulfill the needs of its users for breastfeeding information (Anderson, 2011; Rubin, 2002). In comparison, the number of average daily active users exhibited fluctuations during the studied period. Interestingly, the FBSG observed a higher number of posts during the last two months of the study and the highest number of average daily active users during the last month. Because the findings show that the number of total users and the number of average daily active users' metrics are only sometimes parallel, it is warranted for health communication campaigns to

understand and analyze both metrics. While the number of total users provides an idea of the platform's overall reach, including active and inactive users, the average daily active user's metric allows to focus on real-time engagement, which is crucial for health communication campaigns to adjust their message strategy for their priority population and optimize engagement. The results showed several distinctive relationships between the motivations, formats, and sources of the posts and the number of user views, reactions, and comments. Posts containing breastfeeding-related questions had a higher number of user views and comments. Comparably, the most posted motivation for administrators and users was asking breastfeeding-related questions (56.0%). This aligns with the fact that posing questions on social media platforms, such as Facebook, can often encourage user engagement and interaction (Wagg et al., 2018, 2019). On the other hand, the FBSG participants were less likely to comment on a post that provided breastfeeding-related information. Considering that the second most common motivation was providing information (45.0%) and the vast majority of the informational posts were made by administrators, we can infer that users passively consumed the posts (e.g., scrolling through the posts). Another interesting finding is that although sharing experiences was the least common posted motivation, posts including breastfeeding-related experiences were viewed more. Given that administrators significantly posted more than WIC participants, it could indicate that FBSG may benefit from incorporating wall posts where administrators or lactation consultants share their breastfeeding experiences, include relatable knowledge or skills, and past challenges to allow participants to feel comfortable sharing their breastfeeding journey and asking questions fostering a supportive and non-judgmental environment.

In the context of FBSGs, participants join these Wisconsin WIC FBSGs seeking various gratifications, such as information, emotional support, affirmation, shared experiences, and

resources related to breastfeeding. The study findings align with the U&G theoretical framework, as the study indicated that FBSG participants primarily seek information and support, especially through asking questions and sharing experiences. These motivations reflect users' needs for knowledge and emotional reinforcement, which are fundamental aspects of the U&G theory.

Consistent with Kim and Yang (2017), posts featuring videos garnered fewer user views, and administrators and users posted videos less frequently than in other formats. Given that user engagement increased around midday, it is possible that participants skimmed through their Facebook feeds during short breaks at work or nap time of their infants and avoided videos that could take extra time to download and play. In addition, *Facebook Insights* does not account for a video as seen at least three seconds after people click to play it (Meta, 2024). Furthermore, posts with images received more reactions but fewer comments. A possible explanation is that posts with images may be designed to provide visual information or demonstrate breastfeeding techniques, which might not necessarily require additional comments. Group members may feel less compelled to comment if the post content effectively conveys the intended message visually.

Lastly, the findings showed that posts from administrators were negative predictors of views. This finding should not be construed as a reason not to use administrators in FBSG because previous studies indicate the advantages of having groups administered by specialists (e.g., Changrani et al., 2008; Klemm, 2012; Lepore et al., 2014). Instead, administrators may adopt specific motivations and formats that increase user engagement in their posts. For example, FBSG administered by lactation consultants can strategize posting images with captioned breastfeeding-related questions or shared experiences that will resonate positively with the participants.

Although producing noteworthy results, it is important to note that these findings may not be generalizable to all low-income women or gender identities or represent the experiences of WIC participants in other areas, as the study did not assess other factors that could influence user response behaviors, such as cultural beliefs or socioeconomic status and was limited to one FBSG in Milwaukee. Future research could explore these factors to develop more targeted and effective health communication campaigns and include several FBSG for promoting breastfeeding/chestfeeding. In addition, the study relied on self-selected participants who chose to join the Milwaukee County FBSG. Those who did not join the group may have different experiences or needs related to breastfeeding support. Moreover, the study analyzed data from a six-month period, which may not capture long-term behaviors or changes in breastfeeding support engagement or needs. Future research could benefit from longer-term follow-up. Future research may also include qualitative data from participant interviews or focus groups, which could provide additional insights into participants' experiences and needs. Furthermore, to ensure privacy and maintain a safe and trusted space, the demographic information of members in the FBSG administered by the Wisconsin WIC program was strictly confined within the program and not shared outside. Finally, the R-squared values of the regression models were low, although all the models were statistically significant. Researchers need to continue exploring other predictors of post views, user reactions, and comments to help design more engaging health communication campaigns.

In conclusion, this research found that metrics such as total users, average daily active users, and post-performance metrics in FBSG are essential to reach and engage low-income pregnant people who wish to breastfeed/chestfeed. Moreover, this study identified that posts containing breastfeeding-related questions and experiences garnered more views and comments,

while posts with videos received fewer views and reactions among the Wisconsin Milwaukee County FBSG WIC participants. We hope the findings of this research provide practical insights into the development of future Facebook-based interventions focused on low-income women to support their breastfeeding journey.

Paper 2 – Providing Breastfeeding Support through Facebook Groups: An Integrated Behavioral Model Analysis of Focus Groups among WIC Participants and Administrators

Abstract

The potential of Facebook groups as a platform for breastfeeding support has been increasingly recognized in recent studies. However, prior research has often lacked a robust theoretical framework or failed to include the perspectives of administrators. This paper investigates the experiences of low-income women and administrators using FBSGs to understand how breastfeeding attitudes, perceived norms, self-efficacy, and knowledge and skills influence their participation in FBSGs and breastfeeding behavior. In addition, it aims to explore the value of the IBM related to breastfeeding information seeking and sharing and the support mechanisms within these groups by examining the detailed interactions of these constructs in shaping and facilitating FBSGs among low-income women. Qualitative, digitally recorded, semi-structured focus groups were conducted—two with participants and one with administrators. Data were analyzed using a reflexive thematic analysis model in a hybrid inductive-deductive approach, and the IBM was used as a theoretical lens through which the data were analyzed. By examining participants' and administrators' perspectives, the study highlights the effectiveness of FBSGs in fostering positive attitudes towards breastfeeding, offering a supportive community, and sharing experiences and advice. Moreover, the IBM framework facilitated an organized examination, incorporating various behavioral determinants like attitudes, specifically descriptive norms, personal agency, knowledge, skills, and environmental facilitators, to improve the efficacy and scope of FBSGs among low-income women.

Introduction

The importance of providing breastfeeding information and support cannot be overstated, as it is vital for the health of infants and mothers (CDC, 2023; WHO, 2023). However, women with lower socioeconomic status face barriers to accessing adequate and consistent breastfeeding information and support in the U.S. (Hunt et al., 2021; Jones et al., 2015; McCann et al., 2007). These women are also less likely to initiate breastfeeding and have shorter durations of breastfeeding (Foster et al., 2023; Heck et al., 2006; Segura-Pérez et al., 2021).

As inequitable access to resources and breastfeeding support challenges public health in the U.S., federally funded programs have focused on strategies to improve breastfeeding rates among low-income pregnant women and new mothers. For example, the USDA launched *the Learn Together. Grow Together* campaign to promote breastfeeding and support WIC mothers. The Campaign was carried out in several states and utilized various channels to support new mothers in their well-being and breastfeeding journey. FBSGs constituted a campaign component in some states.

FBSGs have been shown to be a reliable source of breastfeeding information and support (Bridges, 2016; Cooper et al., 2021; Robinson, Lauckner, et al., 2019; Skelton et al., 2018; Wagg et al., 2018, 2019; Wilson, 2020). For example, a longitudinal study that followed 17 FBSGs found that participating women improved their breastfeeding confidence, knowledge, and attitudes (Wilson, 2020). Interestingly, younger and less educated breastfeeding women reported receiving more support from their FBSGs than older and more educated breastfeeding women (Wilson, 2020). A study among African-American women found that FBSG participants had longer intended breastfeeding duration after joining the FBSGs (Robinson, Lauckner, et al., 2019).

Notwithstanding the potential of FBSGs in promoting breastfeeding among low-income women, there are gaps in research that are crucial for organizing and managing FBSGs. One is the need for a comprehensive framework to provide a structured approach and guide the refinement of FBSGs for this population. A recent study of primiparous mothers in Ireland applied the social cognitive theory (SCT) to explain the relationship between participants' use of FBSGs and greater breastfeeding success and longer duration through reciprocal determinism and increased self-efficacy (Black et al., 2020). The SCT offers valuable insights into various aspects of breastfeeding promotion and interventions. The analysis revealed that self-efficacy belief was the central theme, as participants described how the FBSG positively affected their confidence, skills, and ability to breastfeed, enabling them to feed in public without concern for social stigma (Black et al., 2020). However, there is a compelling case for exploring additional frameworks that can enhance our comprehension of this process, particularly when we seek to understand breastfeeding not solely as a matter of individual choices but as socially structured or engineered behavior. Another important gap in the current literature is administrators' experiences with and perspectives on FBSGs. Previous research suggests that administrators play an important role in enhancing the experiences of online support group participants (Haller et al., 2018; Klemm, 2012; Lepore et al., 2014; Regan & Brown, 2019). Nonetheless, no previous study has incorporated administrators' experiences and perspectives within the context of FBSGs.

Theoretical Framework. This paper employed IBM's key constructs – attitudes, perceived norms, personal agency, knowledge and skills, and environmental constraints – as a framework to guide the investigation into how low-income women and administrators engage with Wisconsin WIC FBSGs. This approach facilitates a multifaceted understanding of the behavioral determinants affecting the use of digital platforms for breastfeeding support.

Among the key constructs of the IBM, three instrumental components are deemed particularly relevant to breastfeeding promotion among low-income women (Glanz et al., 2015, pp. 104-120). First, women need the knowledge to carry out breastfeeding behaviors. Second, women require the skills and techniques to breastfeed. Third, there should be no or few environmental constraints that make breastfeeding performance difficult or impossible (Glanz et al., 2015, pp. 104-107).

Research has shown that knowledge and skills influence breastfeeding practices (Gleason et al., 2020; Nobari et al., 2017; Pitts et al., 2015; Radzynski & Callister, 2015). For instance, knowledge about the correct breastfeeding technique is crucial for ensuring proper latch, milk supply, and infant satisfaction (Gleason et al., 2020). Moreover, knowledge and skills acquired through breastfeeding education for pregnant women can significantly influence the initiation and duration of breastfeeding, ultimately promoting successful breastfeeding practices (Pitts et al., 2015).

Additionally, the significance of workplace lactation support for low-income breastfeeding mothers is underscored, particularly when facilitated by WIC service sites, where access to peer counselors and lactation consultants is linked to longer durations of breastfeeding (Angeletti & Llossas, 2018; Ballou et al., 2017; Gleason et al., 2020; Lennon et al., 2017; Payton et al., 2019). Research highlights variability in the availability of lactation support across businesses, pointing to the need for improved support from all employers to enhance breastfeeding initiation and duration (Ballou et al., 2017; Lennon et al., 2017). Additionally, successful collaboration between WIC programs and hospitals has demonstrated the potential to increase breastfeeding rates through targeted staff training (Angeletti & Llossas, 2018; Gleason et al., 2020). These

environmental facilitators in employment settings are important in promoting breastfeeding among new mothers.

This study explores participants' and administrators' attitudes towards FBSGs, including their perceived benefits and drawbacks of using Wisconsin WIC FBSGs for breastfeeding support. This paper also examines the social pressures and norms that impact the use of FBSGs and breastfeeding behavior among low-income women and administrators. Moreover, this study investigates the perceived ease or difficulty of accessing and utilizing FBSGs. Furthermore, knowledge, skills, and environmental constraints or facilitators are explored to identify what makes breastfeeding difficult or possible.

Study Aims and Research Questions. This study employs the IBM's theoretical constructs to explore the experiences of WIC participants and administrators using FBSGs to receive and provide breastfeeding information and support.

Methods

Setting. As part of the *Learn Together. Grow Together* campaign, the Wisconsin WIC program launched five FBSGs across the state, starting in January 2021. The smallest FBSG had 26 members, and the largest had 479 members by the end of the campaign period, July 2021. Each FBSG had two administrators, a lactation consultant and a breastfeeding peer counselor. Administrators were local to the region or population group that the FBSG targeted, and one administrator was bilingual in English and Spanish.

The FBSGs were private, and onboarding questions were asked for group membership approval. Only pregnant or breastfeeding Wisconsin WIC participants living in corresponding regional sites were eligible. The requirements for Wisconsin WIC are to live in Wisconsin, have an annual income below the WIC income guidelines, and need help with health, nutrition, or

breastfeeding support. In addition, the person must be pregnant currently or have had a baby in the past six months, provide breastmilk to a WIC-enrolled baby under 1 year of age, or care for a child younger than 5 years of age (DHS-WI, 2023).

Administrators posted evidence-based content several times a week. In addition, they answered questions from participants and moderated the conversations when needed. Posts were made in English and Spanish.

Focus Group Participants. Three focus groups were conducted, two with participants and one with administrators from several Wisconsin WIC FBSGs. WIC participants were recruited via wall posts on all Wisconsin WIC FBSGs. Participants' eligibility was confirmed through onboarding questions on their selected Wisconsin WIC FBSGs (i.e., verifying Wisconsin WIC participation and pregnant or breastfeeding status), and only approved members were eligible for the focus group session. A confirmation email and text message with the focus group details were sent. Attendees received a \$50 e-gift card for their time. One focus group with participants (FG 1) had 17 women, and the other group (FG 2) had 11 women. All 10 administrators from the five Wisconsin WIC FBSGs participated in the administrator focus group (FG 3).

Data Collection. The study design included semi-structured focus groups with pre-planned questions and topics for discussion that aligned with the IBM, ensuring that key areas of interest were covered and allowing flexibility to explore emergent themes and unexpected insights. See Appendix B, Table B1.

Data Analysis. Digital recordings were transcribed verbatim, checked for accuracy against the recordings, and subsequently transferred to NVivo (Version 14). Braun and Clarke's reflexive thematic analysis model was used in a hybrid inductive-deductive approach to analyze

and interpret the data (Braun & Clarke, 2019, 2020). Data analysis began with an inductive process, identifying themes that emerged directly from the data without preconceived ideas. Then, after the initial inductive analysis, a deductive approach was conducted to validate the findings using the IBM.

Results

The participants and administrators described several components of IBM and the benefits of using and conducting WIC FBSGs. They also provided practical recommendations to improve breastfeeding information and support through FBSGs among low-income women.

Attitudes towards breastfeeding. The focus group discussions revealed that low-income mothers had experiential and instrumental positive attitudes toward breastfeeding, especially at the beginning of their journey. Their feedback also suggests the need for encouragement, advice on breastfeeding techniques, and the importance of support from healthcare providers, lactation counselors/administrators, and peers to enhance their attitudes toward breastfeeding.

Participant (FG 2): I feel like brand new moms, first baby, are all for it, to breastfeed. I feel like any motivation helps them when leaving the hospital. Also, I feel like having pregnant moms in this group and motivating each other, that's very helpful. Even for us, me, I just got that latch reminder from our administrator and like, "Come on, moms, you know better. Your baby's nine months old. You should know that latch was not good." [laughs] I'll take it.

Participant (FG 1): The most beneficial for me was the tips and the encouragement, knowing that I can always count on the girls to be there whenever I need them.

From the perspective of administrators, they highlighted how connecting WIC moms, language inclusivity, personalized welcoming posts for new members, and interactive content leveraged the strengths of the FBSG and enhanced participants' attitudes towards breastfeeding.

Administrator: For moms to be able to connect with other moms who have limited financial resources and are doing this nursing thing, maybe partially because it's free, is a good thing, to know that they can ask a question and you're not going to get all these recommendations to buy these tools that you can't afford.

Administrator: The group allowed us to give praise to moms, which moms don't get on a daily basis. "You're doing a great job. What you're doing is important." It's just so valuable to hear that as a mom. [laughs] You need to see it posted on a Facebook group. Moms need to hear it.

Administrator: The other thing I have to add is just having the posts as well in Spanish. That was helpful to moms that speak another language because there are not that many groups that have that.

The focus group discussions from low-income women highlight the significance of encouragement, practical advice on breastfeeding techniques, and the critical role of lactation counselors as administrators in their WIC FBSG. Administrators of the groups emphasize the benefits of connecting mothers, ensuring language inclusivity, offering personalized information, and engaging with interactive content to bolster their positive attitudes towards breastfeeding.

Perceived Norms. Data indicated that participants had experienced pressure from healthcare providers, especially after delivery at the hospital, to bottle-feed rather than breastfeed.

Participant (FG 1): If you get the one nurse that it's like bottle-feed, bottle-feed, and they are pushing the bottle, and they are just not helping you.

Participant (FG 2): I was trying to feed her in the hospital. I had gestational diabetes, so they were also testing our blood sugar. The nurse was like, "We need to make sure her blood sugar is high," and just squirted formula in her mouth while I was trying to nurse her. It was like I didn't know how to advocate for myself since I hadn't been in any groups yet, working through that.

Participants also expressed their desire to join the FBSG for reassurance and validation, indicating a perceived expectation to seek and value communal support and guidance.

Participant (FG 1): it's nice to receive feedback and support, many information is helpful, and also, I like to be supportive to other moms because being a new mom is a hard task.

Participant (FG 2): I wanted to join after she told me about it, so I could continue to hear other women's either stories, struggles, or triumphs to remind myself that everything's OK and other people are going through these things too.

In addition, administrators identified examples of perceived norms, injunctive and descriptive, within the focus group discussion, highlighting the group's norms regarding breastfeeding practices, seeking and offering support, and the importance of safety and health

practices. They further illustrate the FBSG community's shared values and behaviors, guiding how members believe they should act and how they perceive others in the group typically act.

Administrator: Making sure to answer those things right away and just go back to the rules, reference the rules and also letting them know with that particular circumstance that if they breastfeed more, the more they will produce milk or pump more, the more they will collect more milk.

Administrator: Our group, it was always positive. There was one time, we had a co-sleeping post. I just posted safe sleep recommendations. I got a not really disagreement, but the moms were supporting each other as far as co-sleeping. I pretty much gave them the facts.

Administrator: I also feel like when moms are able to connect with other moms over breastfeeding, it helps to grow that culture of breastfeeding as the norm. Even if they maybe don't have a friend or a family member, where they feel like breastfeeding is normal, here is a huge group of people in their community that do. That was really cool.

The data reveals a distinction between subjective and descriptive norms within the experiences of Wisconsin WIC FBSG participants. Subjective norms are highlighted by participants feeling pressured by healthcare providers to bottle-feed rather than breastfeed immediately after delivery, reflecting perceived social expectations from authoritative figures. Conversely, descriptive norms are illustrated through participants' desires for community support and validation, indicating a collective behavior or trend within the FBSG towards seeking and valuing communal advice and shared experiences. Administrators further underscore these norms by discussing the group's collective attitudes towards breastfeeding, support

mechanisms, and health and safety protocols, showing how members perceive the expected behaviors within the community and how they observe others acting, thus reinforcing the culture of breastfeeding as the standard practice within their Wisconsin WIC FBSG.

Personal Agency. The focus group discussions illustrated the participants' beliefs in their ability to manage their breastfeeding journey effectively due to their participation in their Wisconsin WIC FBSG. Their perception of carrying on with breastfeeding and their confidence in breastfeeding was overcome by connecting with other moms in similar situations and knowing that their struggle was part of the process.

Participant (FG 1): Knowing that I have this group, and I can connect with moms on a personal level is amazing. I definitely don't feel any judgment from anybody in the group. That's definitely making it easier, I feel, for everybody to continue on the struggle.

Participant (FG 2): For me, what is most beneficial is whenever I googled questions, it's usually worst-case scenario. I'm afraid my baby's dying. Whereas, in the group, you hear from other moms who are like, "It's OK. This is completely normal. This is what's probably going on." That helps me in my paranoia that I'm doing everything wrong. It just helps me to calm down.

Furthermore, administrators show the ability to influence the FBSG environment by empowering low-income mothers through participation, managing breastfeeding challenges, and adapting to their needs.

Administrator: A big thing that we wanted to provide is access to breastfeeding support virtually for people who weren't able to or didn't want to have to leave the house for it,

and also a community of other like-minded moms who will know what you're going through.

Administrator: We promoted it as another tool where we encourage moms to connect with other WIC moms. When I talk with some moms, they're like, "Oh, you know, I was able to find other moms in the same situation, same scenario, like moms that have twins."

The focus group discussions emphasize a significant sense of personal agency among participants, rooted in their confidence to manage breastfeeding challenges successfully through group support. Participants valued the non-judgemental environment and the collective wisdom shared within their WIC FBSG, which contrasted with the uncertainty often encountered during their solitary internet searches. Moreover, administrators discussed their focus on creating an accessible virtual environment and encouraging connections among low-income mothers facing similar situations.

Knowledge and Skills. Participants praised and acknowledged the need for practical advice on breastfeeding information, techniques, and nutrition. Awareness of WIC resources and information to facilitate breastfeeding was essential for low-income mothers.

Participant (FG 1): The Facebook group's helpful, because you can ask a question at any time and get an answer right away because usually, somebody is awake at any time, so it's quicker than calling a doctor or whatever.

Participant (FG 1): The information from the breastfeeding counselors is always spot on. If they don't know the answers, they go and find it for me. I like that they go above and beyond to make sure that my questions get answered.

Participant (FG 2): I would personally want to see more tips on what to eat when you're breastfeeding because, like I said in the past, I've struggled a lot with staying healthy, motivated, and energized. I get WIC, so I know that I'll get vegetables, fruits, whatever, but if I could get some ideas of what moms are eating or drinking to stay healthy and motivated through their breastfeeding journey, that would help me a lot.

Participant (FG 2): Educating about hindmilk, and foremilk, and the importance of not oversupplying your milk for your baby is definitely...Stuff like that I feel like is something that I wish I would have known...

In addition, administrators reflected a concerted effort to enhance breastfeeding knowledge and skills among participants, tailored to their unique needs and circumstances.

Administrator: So many moms turn to social media for advice. It's not always evidence-based advice or...What's the word I'm looking for? Good advice? [laughs] You can find a lot of bad advice on social media. The goal or hope out of having the Facebook support group was to reach moms in their homes. They can stay in the comfort of their homes and have a community of support of peers without having to travel for that and hopefully get evidence-based advice while they're doing it.

Administrator: What I love? I love helping moms. This is another great tool. I'm very, very happy that I was able to be part of that and that I was able to connect with moms in another way. Just looking at their picture as well. They were able to see my picture and see my family, too. I think we've connected more that way, too. Questions that I didn't know, I will yield, like I said, to the nutritionist or a manager to get more help with that.

The discussions emphasized the value of immediate access to reliable advice and the availability of support. Participants also preferred to seek practical information about breastfeeding through WIC FBSG rather than traditional healthcare consultations. Mothers also voiced a desire for more detailed guidance on nutrition during breastfeeding and specific lactation issues, such as sore nipples, latching, low milk supply, and engorgement. Administrators acknowledged their responsibility in providing evidence-based advice through WIC FBSG, aiming to counteract the prevalence of misinformation. Nonetheless, administrators further discussed the need for additional training on specific subjects (e.g., latching, low milk supply) and post resources to provide in the WIC FBSG.

Environmental facilitators. Participants explained how including lactation counselors as FBSG administrators fostered a positive and supportive environment for participation. Participants mentioned how small groups, immediate assistance, and feedback helped them participate in their WIC FBSG.

Participant (FG 1): It's just something about it being smaller. I know that whenever I post a question, I'll get an answer within at least a day or less.

Participant (FG 2): I asked a couple of questions about certain veggies as to what I could use with my WIC, and I had got an answer right away. Then, I was able to figure out that I could scan within the app and see as to what would be eligible, and what is not eligible.

Participants also described their struggles as breastfeeding mothers (e.g., providing breast milk for premature babies) and repeatedly regretted not discovering the FBSG sooner. "Knowing about it sooner" was repeated by all participants in both focus groups. They highlighted the need to improve accessibility and early engagement to join the WIC FBSG. Participants suggested that

WIC staff send invitations to eligible participants through various methods, such as word of mouth, WIC website, email, and SMS text.

From the perspective of administrators, they expressed how Wisconsin WIC FBSG functioned as an environmental facilitator for low-income women who needed access to breastfeeding and WIC information and resources.

Administrator: Some moms seem to ask nutrition questions and just general questions about WIC, which it was nice that we were able to answer those questions without having them call and take up additional staff time. We receive questions about farmers' market checks, added cash value benefit for their WIC fruits and vegetables. It's nice that the participants on the page are using it to get other WIC-related questions answered, but they're using it that way in a limited basis.

Administrator: They're able to find encouragement, words in there, connect with other WIC moms, find resources. Like Lauren said, it was perfect as far as like a great resource.

Including lactation counselors as administrators and sharing information and support within a closely-knit virtual community stand out as crucial environmental facilitators. Participants highlighted the advantages of immediate assistance and feedback, personalized outreach by lactation counselors, and the platform's efficiency in addressing urgent needs, such as sourcing breastfeeding equipment. Furthermore, the ability to enhance practical advice on utilizing WIC benefits for specific needs underscores the FBSG's role in facilitating access to essential resources. Administrators observed the dual function of the FBSG as a direct link for breastfeeding support and a conduit for navigating the WIC program more efficiently.

Discussion

The study explored the experiences and perspectives of low-income women and administrators using FBSGs to access and provide breastfeeding information and support. Throughout this exploration, the IBM was employed to organize and synthesize findings and provide a structure for breastfeeding promotion through FBSGs among low-income women.

Following the IBM framework to refine support and encourage breastfeeding through FBSGs among WIC participants, the findings of this study suggest specific applications following the IBM constructs.

Attitudes. In the refinement of FBSGs for low-income women, a nuanced approach toward addressing instrumental and experiential attitudes is paramount. Instrumental attitudes focus on enhancing positive perceptions regarding breastfeeding by reinforcing its practical benefits. Therefore, by emphasizing cost savings and the comprehensive health advantages for mothers and children, particularly through posts by lactation consultants/administrators, these groups can influence members towards adopting and continuing their FBSG participation and breastfeeding practices. Additionally, incorporating success stories and testimonials within FBSGs is a powerful tool in bolstering positive attitudes toward breastfeeding. Recent research also shows that these breastfeeding narratives illustrate the tangible benefits and foster a sense of achievable success among members (Alianmoghaddam et al., 2019; Morse & Brown, 2022). Concurrently, experiential attitudes are nurtured by cultivating a supportive community environment conducive to sharing personal experiences and emotions related to breastfeeding. This aspect of FBSGs is crucial as it aids in mitigating feelings of isolation and misunderstanding, promoting a more positive emotional association with breastfeeding. The interplay between instrumental and experiential attitudes within FBSGs is critical in enhancing

the breastfeeding experience and establishing a sustained practice among low-income women. Through this dual approach, FBSGs may be positioned to significantly impact breastfeeding outcomes by addressing the pragmatic aspects of breastfeeding and its emotional journey.

Perceived Norms. In addressing the dynamics of injunctive and descriptive norms within FBSGs, it becomes essential to strategically disseminate stories and endorsements from esteemed community figures, healthcare experts, and peer advocates of breastfeeding. Such narratives are instrumental in recalibrating community perceptions regarding the social acceptability and commendation of breastfeeding. Simultaneously, the deliberate showcasing of breastfeeding as a prevalent practice among group participants serves to standardize this behavior and alleviate women from societal pressures. Including posts, such as conducting polls, sharing personal breastfeeding journeys, and emphasizing vigorous engagement in breastfeeding-centric dialogues, these actions collectively work towards normalizing breastfeeding.

Personal agency. To enhance personal agency within FBSGs, a focus on self-efficacy and salience is pivotal. By offering practical advice, step-by-step guides, and solutions to common breastfeeding issues, the FBSGs empower women with the confidence to navigate the challenges of breastfeeding successfully. Integrating Q&A sessions with lactation experts and mothers further reinforces this sense of capability, providing direct support and knowledge. Additionally, ensuring the relevance of breastfeeding discussions to members' immediate needs and interests heightens the importance of breastfeeding in their daily lives. Tailoring conversations to address the specific challenges low-income women face, such as juggling breastfeeding with employment or education, makes the support provided practical.

Knowledge and skills. In the domain of knowledge and skills application within FBSGs, delivering content that is informative and accessible is crucial. The material shared must be

precise, culturally sensitive, and adjusted to the diverse literacy levels of low-income women. To achieve this, the FBSG should employ a variety of educational formats, including posts, videos, and live sessions, comprehensively covering breastfeeding fundamentals and the myriad challenges that may arise. This strategy fosters an inclusive learning environment and equips mothers with the knowledge and skills necessary for effective breastfeeding.

Environmental facilitators. The FBSGs have navigated environmental constraints faced by low-income women, transforming potential barriers into avenues of support and empowerment. Significant challenges, such as limited time and access to lactation consultants, have been addressed through WIC FBSGs. The implementation of small WIC FBSGs has fostered an intimate and responsive environment, enabling immediate assistance and feedback for low-income women. This approach is echoed by previous studies indicating that social media alleviates new mothers' sense of isolation and ensures that their questions and concerns are promptly addressed (Alianmoghammad et al., 2019; Wagg et al., 2018). Furthermore, administrators recognized FBSG as an effective tool for disseminating WIC-related information and resources, streamlining access to support without overwhelming staff resources, and enhancing the overall experiences of breastfeeding low-income mothers.

Limitations and implications for practice. When considering the implications of the findings, it is important to deliberate the population from which the study sample was drawn, as only Wisconsin WIC members participated in the FBSGs. It may be pertinent to reflect on whether the women's experiences and perspectives would have been different had they been members of other WIC state agencies. Therefore, future research may want to incorporate several FBSGs with different WIC state agency members that provide breastfeeding information and support. Furthermore, the demographic attributes of the focus group participants are

unknown, which might limit the insights this study could provide to researchers and practitioners. The demographic information of the focus group participants was strictly confined within the program and not shared outside to ensure privacy and maintain a safe and trusted space.

Moreover, compared to the research conducted by Black et al. (2020) that investigated women's experiences using Facebook groups for breastfeeding support using the social cognitive theory, the IBM provides a comprehensive approach to enhancing FBSG's implementation. The IBM framework allowed a structured yet explorative analysis considering multiple determinants of behavior, such as attitudes, perceived norms (specifically descriptive norms), personal agency, knowledge, skills, and environmental facilitators, to enhance the effectiveness and reach of FBSG among low-income women.

In conclusion, this paper underscored the significant role of FBSGs, as analyzed through the IBM, in enhancing breastfeeding support and information for low-income women. By examining participants' and administrators' perspectives, the study highlights the effectiveness of FBSGs in fostering positive attitudes towards breastfeeding, offering a supportive community for sharing experiences and advice, and facilitating access to reliable breastfeeding and WIC-related resources. Future initiatives should focus on expanding outreach and accessibility of FBSG to engage more mothers early in their breastfeeding journey, leveraging the insights provided by the IBM to refine further and enhance these digital support platforms.

Paper 3 – Promoting Breastfeeding among WIC Participants through Facebook Breastfeeding Support Group Participation: A Serial Mediation Model

Abstract

Promoting and supporting breastfeeding is essential to public health to reduce health inequity among women and children. FBSGs have emerged as a valuable resource for low-income women to support their breastfeeding efforts. This study aims to shed light on the association between the level of FBSG participation and breastfeeding duration through mediating variables such as breastfeeding social support and self-efficacy. A total of 93 low-income women from five Wisconsin WIC FBSGs participated in an online survey as part of the *Learn Together. Grow Together* campaign from the USDA Food and Nutrition Services WIC program. A mediation analysis was performed using PROCESS, a statistical analysis tool that simplified the investigation of direct and indirect effects among variables, to assess the association between the level of FBSG participation and breastfeeding duration with breastfeeding social support and self-efficacy as mediators. The higher level of FBSG participation was positively associated with breastfeeding social support and self-efficacy among WIC participants. Moreover, the direct effect of breastfeeding self-efficacy on breastfeeding duration was positive and statistically significant. Nonetheless, the indirect associations of the level of FBSG participation with breastfeeding duration through breastfeeding social support, self-efficacy, and their combined mediation were not statistically significant. The results highlight the potential of social media-based support groups to bridge gaps in providing breastfeeding support and self-efficacy among low-income women.

Introduction

Breastfeeding significantly contributes to promoting public health and reducing health inequity (Segura-Pérez et al., 2021). Therefore, improving breastfeeding practices has become a major health policy objective in the U.S. (Rhodes et al., 2021; Rosen-Carole et al., 2022; Zhang et al., 2021). Prenatal breastfeeding promotion interventions and postnatal breastfeeding support have improved breastfeeding practices (CDC, 2022; Thoma et al., 2023; USDA, 2023; WIC, 2021).

Despite overall improvement in breastfeeding rates in the past three decades, the social gradient within the U.S. is much more complex than just socioeconomic position (Gyamfi et al., 2023; Hedberg, 2013). Previous studies have identified the lack of support from health providers and partners and breastfeeding self-efficacy as key factors associated with the lower breastfeeding rates of low-income women (Blyth et al., 2002; Callen & Pinelli, 2004; Economou et al., 2021; Entwistle et al., 2010; Hamze et al., 2018; Meyerink & Marquis, 2002; Mitchell-Box et al., 2013; Mitra et al., 2004; Morse & Brown, 2021). Moreover, evidence suggests that social support primarily influences exclusive breastfeeding through its association with self-efficacy (Miller et al., 2022).

During the past decade, FBSGs have emerged as a vital source for new mothers seeking information, encouragement, and community support around breastfeeding (Robinson, Davis, et al., 2019; Robinson, Lauckner, et al., 2019; Skelton et al., 2018; Wilson, 2020). These online platforms can be particularly beneficial for low-income women who may face barriers such as limited access to support networks, time constraints due to work, and lack of personalized information (Moon & Woo, 2021; Wagg et al., 2019). Furthermore, an intervention study indicated that breastfeeding social support influenced exclusive breastfeeding through its

association with self-efficacy (Uzunçakmak et al., 2022). However, it is unclear if breastfeeding social support and self-efficacy have a direct and/or indirect influence on the relationship between the level of FBSG participation and breastfeeding practices, specifically duration. Moreover, it is unknown if the level of FBSG participation (low versus high participation) among low-income women can influence breastfeeding duration, considering that social media engagement can significantly influence user behavior (Dolan et al., 2019; Shahbaznezhad et al., 2021).

Theoretical Framework. The IBM provides a theoretical basis for understanding behavior and identifying specific beliefs to target. According to the model, when there is already an intention to perform a behavior, the constructs that become particularly important in determining whether the behavior will actually occur include self-efficacy, knowledge and skills, and environmental facilitators (Glanz et al., 2015, pp. 104-120).

In the context of understanding FBSG participation, social support, self-efficacy, and breastfeeding practices, the IBM suggests that both constructs can significantly impact behavior. The heightened need for breastfeeding social support among low-income women posits social support as pivotal for their breastfeeding success (Edelblute & Altman, 2021; Houghtaling et al., 2017). Previous studies show a clear association between social support and successful breastfeeding (Gleason et al., 2020; Morse & Brown, 2021; Ogbo et al., 2020; Renfrew et al., 2012). A strong support network of healthcare professionals, family, and peers significantly boosts breastfeeding initiation and duration (Ogbo et al., 2020; Renfrew et al., 2012). In addition, a positive association between WIC site-level support and breastfeeding at two, six, and 12 months has been found among low-income women (Gleason et al., 2020). Furthermore, specific

social support geared towards exclusive breastfeeding is associated with higher odds of exclusive breastfeeding, which was almost fully mediated by self-efficacy (Uzunçakmak et al., 2022).

Moreover, women's breastfeeding self-efficacy has been identified as one of the strongest modifiable predictors of breastfeeding initiation and duration (Blyth et al., 2004; Dennis & Faux, 1999; Economou et al., 2021). A strong sense of breastfeeding self-efficacy results in a positive perception and success-promoting thought patterns concerning the mother's ability to breastfeed (Hamze et al., 2018). In contrast, low self-efficacy is more likely associated with negative experiences, thought patterns, and emotional reactions (Economou et al., 2021). Recent research identified that the use of social media also influences breastfeeding self-efficacy (Robinson et al., 2019b). For instance, Robinson et al. (2019b) found that breastfeeding self-efficacy remained a significant predictor of intended breastfeeding duration among African American mothers.

Study Aims and Research Questions. Therefore, this study aims to shed light on how the level of FBSG participation is associated with breastfeeding practices, specifically duration, including the mediators of breastfeeding social support and self-efficacy.

RQ 3.1: What are the direct and indirect effects of the level of FBSG participation on breastfeeding duration through breastfeeding social support and self-efficacy?

Methods

Setting. After six months of the Campaign, in July 2021, Wisconsin WIC women participating in any of the five Wisconsin FBSGs were invited to participate in the online survey. See Chapter III, p. 23, for details.

Sample. A total of 93 low-income women from five Wisconsin FBSGs participated in an online survey. The survey link was posted on Facebook and made available to all participants admitted to the FBSGs. The FBSG group administrators also sent the survey link through private

inbox and text to FBSG users. There was an incentive of \$10 for completing the survey. Eligibility criteria for the study included (a) verification of Wisconsin WIC participation, (b) membership in one of the FBSGs, and (c) breastfeeding at any time during the analyzed period and having had their baby in the last 12 months. Exemption from the university's institutional review board was secured prior to data collection.

Measures

Demographic questions measuring participants' age, race/ethnicity, marital status, employment, and breastfeeding experience were included.

Independent variable. The level of FBSG participation was measured by asking, "About how often do you visit this WIC Facebook breastfeeding support group?" Possible responses were "several times a day," "about once a day," "a few times a week," "every few weeks," and "less often." Subsequently, a binary categorization approach was adopted. Visiting their FBSG a few times a week or less often was coded as low participation (0), and visiting their FBSG about once a day or more often was coded as high participation (1). This variable was dichotomized to understand the different impacts of low versus high FBSG participation on breastfeeding duration. In addition, dichotomizing this variable increased the robustness of the findings by reducing the impact of outliers.

Mediators. Breastfeeding social support was measured by 15 items. Participants were asked to indicate their agreement to these statements on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5): (1) This WIC FBSG allows me to receive the breastfeeding-related information that I need, (2) this WIC FBSG allows me to share my breastfeeding-related knowledge with other moms, (3) this WIC FBSG allows me to receive the emotional support that I need, (4) this WIC FBSG allows me to offer emotional support to other

moms, (5) this WIC FBSG allows me to receive the breastfeeding and parenting advice I need, (6) this WIC FBSG allows me to offer breastfeeding and parent advice to other moms, (7) this WIC FBSG allows me to get the support that I need at a convenient time without leaving my home, (8) this WIC FBSG allows me to choose the information/emotional support/advice I need and ignore what I don't find relevant to me, (9) this WIC FBSG allows me to connect with other moms going through similar experiences, (10) I have received support from my family about breastfeeding, (11) I have received support from my friends about breastfeeding, (12) I have received support from my pediatrician about breastfeeding, (13) I have received support from this WIC FBSG about breastfeeding, (14) I have received support from my WIC clinic about breastfeeding, and (15) I have received support from my WIC peer counselor about breastfeeding. Breastfeeding social support comprised 15 items that explained 70% of the variance with factor loadings from .471 to .814. The responses were averaged to a single score ($\alpha = .902$).

The Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) was used to assess breastfeeding self-efficacy (Dennis, 2003). Participants were asked to indicate their agreement to these statements on a 5-point Likert scale ranging from "not at all confident" (1) to "very confident" (5): (1) I can always determine that my baby is getting enough milk, (2) I can always successfully cope with breastfeeding like I have with other challenging tasks, (3) I can always breastfeed my baby without using formula as a supplement, (4) I can always ensure that my baby is properly latched on for the whole feeding, (5) I can always manage the breastfeeding situation to my satisfaction, (6) I can always manage to breastfeed even if my baby is crying, (7) I can always keep wanting to breastfeed, (8) I can always comfortable breastfeed with family members present, (9) I can always be satisfied with my breastfeeding experience, (10) I can always deal

with the fact that breastfeeding can be time-consuming, (11) I can always finish feeding my baby on one breast before switching to the other breast, (12) I can always continue to breastfeed my baby for every feeding, (13) I can always manage to keep up with my baby's breastfeeding demands, (14) I can always tell when my baby is finished breastfeeding. Breastfeeding self-efficacy comprised 14 items that explained 73% of the variance with factor loadings from .510 to .850. The responses were averaged to a single score ($\alpha = .958$).

Dependent variables. Breastfeeding duration was assessed by the following descriptions: "If you breastfed or pumped milk for your baby but stopped, how many weeks or months did you do this before stopping (in weeks or months)? And "Insert your child's age in weeks or months." The responses in weeks or months were standardized to months using a conversion of 1 week = 1 / 4.33 months to accommodate variable monthly lengths.

Statistical Approach. All statistical analyses were performed using the IBM SPSS Statistics version 29.0.0.0. Ninety-three participants with complete data on all four measures, level of FBSG participation, breastfeeding social support, breastfeeding self-efficacy, and breastfeeding duration, were included in the analysis. Descriptive statistics were performed to provide a comprehensive overview of the dataset. Frequencies, percentages, and Pearson's chi-square tests were conducted for categorical variables, and mean, dispersion (standard deviation), and Welch's t-tests were conducted for continuous variables. Race was grouped as a dichotomous variable for comparison between participants who were White versus non-White (0 = non-White, 1 = White) to highlight disparities between the majority and all other combined minority groups. Employment status was categorized into two groups: staying at home (0) and working or being a student, either part-time or full-time (1), to assess the potential impact of employment status on breastfeeding practices and duration. Marital status was coded as a

nominal variable (1 = Single/Never married, 2 = Married/Living Together, and 3 = Divorced/Separated). Age was used as a continuous variable. All descriptive statistics were calculated by the level of FBSG participation.

Following Andrew F. Hayes's guidelines (Hayes, 2017), the SPSS PROCESS Model 6 was used to test mediation effects. PROCESS is a statistical analysis tool that simplifies the analysis of mediation, moderation, and conditional process modeling (a combination of mediation and moderation). The mediation effect of breastfeeding social support and self-efficacy was tested in nine steps: (i) direct effect of level of FBSG participation (independent variable) on breastfeeding social support (mediator 1), (ii) direct effect of level of FBSG participation on breastfeeding self-efficacy (mediator 2), (iii) direct effect of breastfeeding social support on breastfeeding self-efficacy, (iv) direct effect of level of FBSG participation on duration (dependent variable), (v) direct effect of breastfeeding social support on breastfeeding duration, and (vi) direct effect of breastfeeding self-efficacy on breastfeeding duration. The direct effect was estimated using a standard regression approach within the PROCESS macro. Then, using SPSS PROCESS macro (Model 6), a 5,000 bootstrap sample procedure was used to estimate bias-corrected 95% confidence intervals (CIs) to test the significance of (vii) indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding social support, (viii) indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding self-efficacy, and (ix) indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding social support and self-efficacy. Different numbers of bootstrap samples (e.g., 1000, 2000, 5000, and 10000) were tested to evaluate the stability of the confidence intervals, and all yielded similar results, indicating robustness in the findings. If CIs do not contain 0, indirect associations are significant, indicating a statistically significant

mediating effect (Hayes, 2017). Additionally, the total effect of the level of FBSG participation on breastfeeding duration was calculated, incorporating both direct and indirect pathways to provide a comprehensive measure of its impact.

The analysis adjusted for the effect of the sociodemographic correlates (age, race, marital status, employment status, and breastfeeding experience) in the mediation model to uphold the integrity of the findings. By controlling for potential confounding between the relationship of the level of FBSG participation (independent variable/exposure), breastfeeding social support and self-efficacy (mediators), and breastfeeding duration (dependent variable/outcome), this analysis mitigates the risk of external variables biasing the results. The inclusion of these potential confounders was guided by their influence in recent literature (Morse & Brown, 2022b; Robinson, Lauckner, et al., 2019), where they are shown to impact their level of FBSG participation and breastfeeding duration practices. This approach reinforced the validity of the observed mediating effects.

Results

Participant Characteristics. The descriptive statistics from the study show the sociodemographic and breastfeeding characteristics among participants divided into low and high FBSG participation groups. As shown in Table 3, the sample was 93 women who were part of WIC FBSGs, participated in the online survey, and met the inclusion criteria for this study. There were 39 in the low FBSG participation group and 54 in the high FBSG participation group. The sociodemographic and breastfeeding characteristics, such as age, marital status, race, employment status, and breastfeeding experience, show no significant differences between the low and high participation groups.

Table 3*Sociodemographic Characteristics of Participants by Level of FBSG Participation*

Characteristic	Low participation		High participation		Total		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Marital status							.172
Single/Never married	12	31	8	15	20	22	
Married/Living together	24	61	42	78	66	71	
Separated/Divorced	3	8	4	7	7	7	
Race							.613
White	23	59	29	54	52	56	
Non-White	16	41	25	46	41	44	
Employment status							.935
Stay-at-home mom	22	56	30	56	52	56	
Employed/Student	17	43	24	44	41	44	
Breastfeeding experience ^a	28	72	34	63	62	66	.373
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>			
Age	30.1	4.9	29.1	5.2			.173

Note. *N* = 93 (*n* = 39 for low participation; *n* = 54 for high participation).

^a Reflects the number and percentage of participants answering “yes” to this question.

Table 4 shows WIC participants' breastfeeding duration divided by their FBSG participation level. Mothers with low FBSG participation had a mean of 7.5 months, and mothers with high participation had a mean of 9.7 months. The *p*-value was 0.056, slightly above the traditional threshold for statistical significance, suggesting a trend that higher FBSG participation might be associated with longer breastfeeding duration.

Table 4*Breastfeeding Characteristics of Participants by Level of FBSG Participation*

Characteristic	Low participation		High participation		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Breastfeeding duration	7.5	7.1	9.7	10.1	.056

Note. *N* = 93 (*n* = 39 for low participation; *n* = 54 for high participation).

Table 5 shows the direct and indirect effects of the level of FBSG participation on breastfeeding duration through breastfeeding social support and self-efficacy. These mediators were posited to influence breastfeeding duration, with the analysis controlling for covariates such as age, race, marital status, employment status, and breastfeeding experience. The direct effect of the level of FBSG participation on breastfeeding social support was positive and statistically significant. High FBSG participation was associated with an increase in breastfeeding social support by 0.212 units. Similarly, the direct effect of the level of FBSG participation on breastfeeding self-efficacy was positive and statistically significant. High FBSG participation was associated with an increase in breastfeeding self-efficacy by 0.391 units. Moreover, the direct effect of breastfeeding self-efficacy on breastfeeding duration was positive and statistically significant. High FBSG participation was associated with an increase in breastfeeding duration by 3.765 units. However, the direct effect of the level of FBSG participation on breastfeeding duration was not statistically significant, as the confidence interval includes zero and a *p*-value of 0.390.

The mediation analysis further assessed the pathways through which the level of FBSG participation is indirectly associated with breastfeeding duration through breastfeeding social support and self-efficacy. The indirect effect of the level of FBSG participation on breastfeeding duration through breastfeeding social support was not statistically significant, as the 95% bootstrap CIs include zero. Similarly, the indirect effect of the level of FBSG participation on breastfeeding self-efficacy was not statistically significant, as the 95% bootstrap CIs include zero. Furthermore, the combined mediation effect through breastfeeding social support and self-efficacy was not statistically significant, with a 95% bootstrap CIs including zero. Additionally,

the total effect of the level of FBSG participation on breastfeeding duration, which combined both direct and indirect effects, was calculated to be 2.829 but was not statistically significant.

Table 5

Results from PROCESS macro testing breastfeeding social support and self-efficacy mediation model

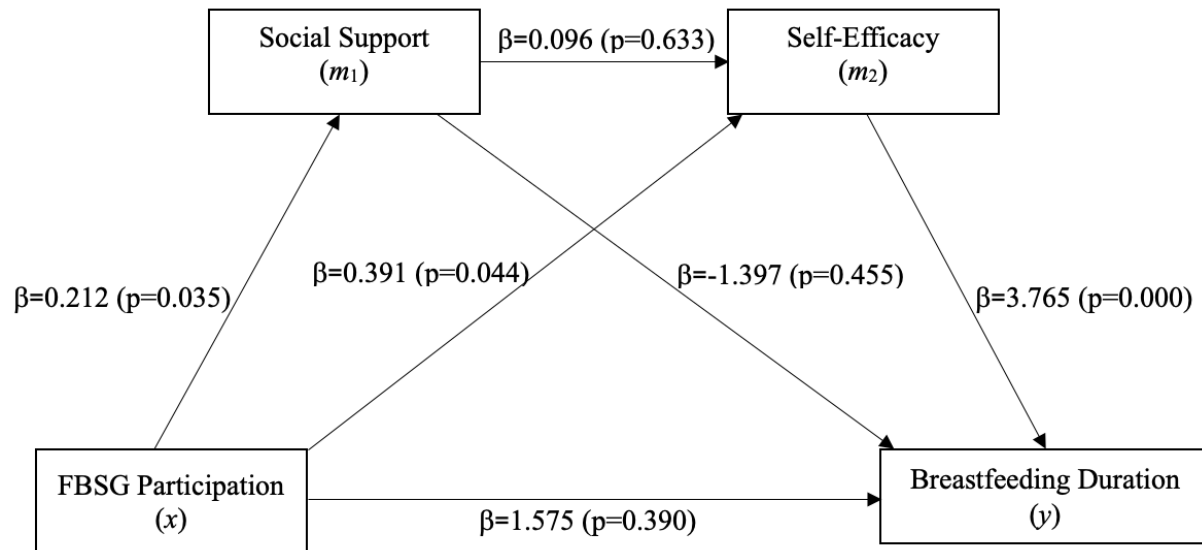
Effect ^a , Variable	R ²	F	β	p	95% CIs	
i. Direct effect of level of FBSG participation on breastfeeding social support	0.123	2.447	0.212	0.035	0.014	0.411
ii. Direct effect of level of FBSG participation on breastfeeding self-efficacy	0.120	1.971	0.391	0.044	0.010	0.773
iii. Direct effect of breastfeeding social support on breastfeeding self-efficacy	0.120	1.971	0.0961	0.633	-0.302	0.495
iv. Direct effect of level of FBSG participation on breastfeeding duration	0.253	4.133	1.574	0.390	-2.050	5.199
v. Direct effect of breastfeeding social support on breastfeeding duration	0.253	4.133	-1.397	0.455	-5.107	2.311
vi. Direct effect of breastfeeding self-efficacy on breastfeeding duration	0.253	4.133	3.765	.000	1.775	5.756
	Effect	BootSE			Boot 95% CIs	
vii. Indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding social support	-0.297	0.512	-	-	-1.590	0.431
viii. Indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding self-efficacy	1.475	0.780	-	-	-0.106	2.935
ix. Indirect effect of level of FBSG participation on breastfeeding duration through breastfeeding social support and self-efficacy	0.077	0.183	-	-	-0.215	0.540
x. Total effect of level of FBSG participation on breastfeeding duration	2.829	1.855	-	-	-.8589	6.518

Note. ^a Adjusted for age, race, marital status, employment status, and breastfeeding experience.

Figure 4 illustrates the output model for the mediation effect of breastfeeding social support and self-efficacy.

Figure 4

Path Models of Direct and Indirect Associations between FBSG Participation and Breastfeeding Duration



Note: β = coefficient, p = p -value.

Discussion

The findings from this study indicate that high FBSG participation is positively associated with breastfeeding social support and self-efficacy among WIC participants. Additionally, this study suggests that the association between the level of FBSG participation and breastfeeding duration is not mediated by breastfeeding social support, self-efficacy, or the serial mediation path involving both social support and self-efficacy. In addition, although the results indicate a positive trend where high FBSG participation was associated with an increase of 2.892 units in breastfeeding duration, the finding is not statistically significant.

However, from an IBM perspective, the results highlight the crucial role of self-efficacy in influencing breastfeeding behaviors in FBSGs designed for low-income women. Consistent with the previous studies that identified breastfeeding self-efficacy as one of the strongest modifiable predictors of breastfeeding behaviors (Blyth et al., 2004; Economou et al., 2021; Robinson, Lauckner, et al., 2019), this study indicates that breastfeeding self-efficacy emerges as a significant positive predictor of breastfeeding duration among WIC mothers frequently using FBSGs. This finding suggests that interventions using Facebook groups aimed at increasing breastfeeding self-efficacy have the potential to prolong breastfeeding duration among WIC participants. The findings also support the notion within the IBM that individuals who believe in their ability to perform a behavior are more likely to carry out that behavior. This is particularly relevant for low-income women who might face more barriers to breastfeeding, such as a lack of resources, information, and support.

Although this study did not find a mediation effect through breastfeeding social support or self-efficacy, the findings suggest that joining and participating in FBSGs significantly improves breastfeeding social support and self-efficacy among WIC participants. Additionally, there is a direct effect of breastfeeding self-efficacy on breastfeeding duration. Therefore, although the indirect pathway of FBSG participation on breastfeeding duration through self-efficacy was not statistically significant, further studies may increase the sample size to enhance the ability to detect an effect.

Limitations. Several limitations must be acknowledged when assessing the association between the level of FBSG participation and breastfeeding duration among WIC participants. Firstly, the study's sample size analyzed was 93 participants. Nonetheless, as this research is exploratory in nature, the smaller sample size can be somewhat mitigated by the study's aim to

generate preliminary insights rather than definite conclusions. This perspective allows for an understanding that, while the statistical power is limited, the study still contributed valuable initial observations to the field. Another limitation is that the generalizability of these findings is limited to low-income WIC participants living in Wisconsin. In addition, the response rate could not be included as it is unknown how many women participated in all five WIC FBSGs during the analyzed period. Thirdly, the reliance on self-reported measures for variables such as breastfeeding duration, level of FBSG participation, social support, and self-efficacy may introduce bias. Self-report measures are subject to recall bias and social desirability bias, which might affect the accuracy of the reported data. Lastly, due to the cross-sectional nature of this study, it revealed associations but did not establish causality. Future studies employing longitudinal designs are essential to elucidate the directionality and causality of these temporal relationships and causal pathways in breastfeeding initiation and duration.

Implications of Findings. The findings underscore the importance of incorporating digital platforms, like Facebook groups, into public health strategies to improve breastfeeding rates. By leveraging the widespread accessibility and community-building capacity of social media/ digital platforms, health practitioners can offer targeted, impactful support that transcends traditional barriers to healthcare access. This approach broadens the scope of public health interventions and emphasizes the necessity for targeted interventions among hard-to-reach populations such as low-income women. Furthermore, the findings offer an initial compelling argument for policymakers to advocate for integrating online support mechanisms within comprehensive breastfeeding services, suggesting a paradigm shift towards embracing digital platforms in health promotion strategies. The potential of FBSGs to reinforce public health efforts highlights an innovative pathway for policy development, funding initiatives, and

healthcare service integration, aiming to enhance maternal and child health outcomes through improved breastfeeding practices in the US.

While this study focused on low-income WIC participating in Wisconsin, future research could explore the effectiveness of FBGS among diverse populations to understand the generalizability of these findings. Expanding the demographic and geographical scope could provide a deeper understanding of the universal and unique aspects of digital support for breastfeeding. In addition, longitudinal studies that follow participation over time would be beneficial to understand better the long-term effects of FBSG participation on breastfeeding duration. These studies could provide insights into how sustained participation in FBSG impacts breastfeeding duration and the persistence of self-efficacy and social support.

In conclusion, this study demonstrates the positive association between high FBSG participation and breastfeeding social support and self-efficacy among low-income women in Wisconsin, highlighting a significant yet previously underexplored avenue for enhancing breastfeeding duration. These outcomes contribute to the increasing evidence of the role of digital platforms in public health interventions and reinforce the potential of social media to bridge traditional gaps in breastfeeding support and advocacy for low-income women.

CHAPTER IV

Conclusion

This dissertation examined how WIC participants were incorporating FBSGs into their breastfeeding support and explored the effectiveness of FBSGs among WIC mothers. This conclusion presents a summary of research findings, makes recommendations for future research, and discusses the contributions the research presented in this dissertation has made to the academic community.

Research Findings

This dissertation comprises three papers contributing to understanding FBSG's effectiveness in supporting WIC participants. The first paper specified the details of the optimal growth and engagement of FBSGs for WIC participants, ensuring a supportive, informative, and inclusive community. The second paper combined the participants' and administrators' experiences and perspectives to design and develop tailored FBSGs for breastfeeding WIC participants. The third paper analyzed the influence of the level of FBSG participation on breastfeeding duration through mediating variables such as breastfeeding social support and self-efficacy among WIC participants.

Paper 1 specified metrics and post characteristics that increased WIC mothers' use and engagement in FBSGs. To reach the most members who see the posted content, this study suggests following the total users, average daily active users, and post-performance metrics to focus on real-time engagement and adjust the posting message strategy accordingly. To engage WIC mothers in FBSGs, posting breastfeeding-related questions is crucial, acting as a key driver in encouraging active participation, building a supportive network, and maintaining the group's role in assisting mothers. Moreover, sharing breastfeeding-related experiences, particularly those

shared by group administrators, generated higher engagement among participants, evidenced by increased views. Additionally, posts that included breastfeeding-related images received significantly more reactions expressed in emojis (e.g., “like,” “love,” “haha,” “wow,” “sad,” and “angry”) by WIC-participating mothers. Paper 1 underscores the importance of strategic content creation for group administrators, highlighting how posting images alongside breastfeeding-related questions or sharing personal experiences can effectively engage WIC mothers.

Paper 2 delved deeper into exploring how the IBM framework can be applied to enhance support in FBSG for WIC participants, incorporating perspectives from participants and group administrators. This study emphasizes the importance of fostering instrumental and experiential attitudes toward breastfeeding by highlighting breastfeeding benefits through success stories and creating a supportive community for sharing personal experiences. The research also underlines modifying perceived norms by showcasing endorsements from community leaders and normalizing breastfeeding through engaging content and discussions. Addressing personal agency in FBSGs, it advocates for practical advice and Q&A sessions to increase self-efficacy, making discussions relevant to participants’ immediate life context. Additionally, this study highlights the necessity of delivering accessible, culturally sensitive information in various formats (e.g., photos, videos, live sessions) to equip mothers with the essential knowledge and skills for breastfeeding. Finally, paper 2 acknowledges the role of FBSGs in overcoming environmental constraints faced by low-income women, offering an intimate support network that addresses their unique breastfeeding challenges.

Paper 3 explored the association between the level of FBSG participation and breastfeeding duration through mediating variables such as breastfeeding social support and self-efficacy, as well as various demographic variables. The pivotal finding of the study is the role of

FBSGs in improving breastfeeding social support and self-efficacy among breastfeeding WIC mothers.

Recommendations for Future Research

Breastfeeding promotion using FBSGs among low-income women requires extensive research to design, implement, and evaluate interventions that effectively engage and support mothers' breastfeeding goals and outcomes. While this study is a great first step in developing evidence-based FBSGs for WIC mothers, additional research is needed to progress the presented findings in this dissertation and tackle other methodological challenges. Future research will enable the development of FBSGs with the target population's specific setting and needs in mind, which can significantly contribute to improving breastfeeding rates, maternal confidence, and overall well-being.

Regarding the first and third papers presented in this dissertation, additional research could expand on extending studies over longer periods and larger sample sizes across diverse WIC participant populations in the U.S. to enhance generalizability and assess the impact of FBSGs on low-income women's breastfeeding attitudes, social support, self-efficacy, and behaviors. In addition, further exploration of post views, user reactions, and comment predictors is warranted to help design a more engaging breastfeeding promotion campaign through FBSGs. It would also be interesting to explore how FBSGs can extend their reach to include more WIC participants and other low-income women in similar circumstances who would greatly benefit from an online support network to sustain their breastfeeding journey.

A careful design, implementation, and analysis of the IBM's application as a framework may determine which FBSG components are likely to be the most important targets for promoting breastfeeding attitudes and behavior change among low-income women. Different

strategies may be needed for different breastfeeding behaviors and also for the same behavior in different settings or populations (Von Haeften et al., 2000). There is no one-size-fits-all approach.

Therefore, it is essential to specify the behavior in terms of action, target, context, and time. Also, future interventions may include qualitative interviews with members of the study population (e.g., WIC participants or low-income women) to elicit salient behavioral outcomes, affective responses, sources of normative influence, and barriers and facilitators associated with the target behavior (e.g., FBSG participation, breastfeeding outcomes). This elicitation phase is necessary and critical. Moreover, a content analysis of the elicitation interviews is recommended to design culturally appropriate survey instruments to measure the IBM constructs. Pilot testing in two WIC states, representing their shared demographic characteristics, is also recommended to improve the clarity of questions and exclusions of other questions. These recommendations may be used to analyze and identify specific behavioral, normative efficacy, and control beliefs that are the best targets for persuasive communication through FBSGs to strengthen low-income women's participation and lead to a greater likelihood of breastfeeding initiation and duration.

Contributions to Knowledge and Practice

This dissertation makes several significant contributions to the existing body of knowledge, particularly in the domain of public health, maternal and child health, and the utilization of social media platforms to enhance breastfeeding outcomes among low-income women. The findings of this research underscore the pivotal role that FBSGs can play in empowering low-income women, specifically those participating in the WIC program, by fostering an environment conducive to breastfeeding.

This research elucidates the utility of FBSGs as an innovative intervention tool for promoting breastfeeding among low-income women. It lays the groundwork for future research to explore the dynamics of social media support systems in public health strategies. Moreover, it opens avenues for developing targeted interventions that leverage FBSGs to encourage breastfeeding practices among vulnerable populations.

A critical finding of this dissertation is that being part of FBSGs helps WIC participants feel more socially supported and more confident in their ability to breastfeed. The increase in confidence is a key factor in starting breastfeeding and plays a significant role in how long low-income mothers continue breastfeeding.

In the era of information overload, where misinformation can easily proliferate, this study underscores the role of FBSGs in countering breastfeeding-related myths. By fostering communities grounded in evidence-based practices and expert guidance, FBSGs serve as critical platforms for disseminating accurate information and mitigating misinformation in public health. In addition, this dissertation delineated how FBSGs can act as a valuable channel for disseminating crucial information about breastfeeding techniques, benefits, and challenges, along with providing insight into WIC resources available to support lactating mothers. This contribution is particularly relevant in ensuring that low-income women are informed and empowered to make decisions that optimize their health and well-being and that of their infants.

Ultimately, this research posits that FBSGs hold the potential to significantly impact breastfeeding rates in the U.S., especially among low-income populations. By providing support, enhancing self-efficacy, and disseminating vital resources and information, FBSGs could contribute to increasing breastfeeding rates. This, in turn, could lead to improved maternal and

child health outcomes, underscoring the significance of integrating social media platforms into public health strategies.

In addition to the documented contributions listed herein in this section, I hope that the research provided in this dissertation encourages not only this generation but also those to come to use social media responsibly and effectively in managing and counteracting misinformation. The findings highlight the critical role social media can play in public health, especially when used strategically to disseminate accurate information, foster informed communities, and challenge the spread of false narratives. It serves as a call to action for current and future public health researchers, professionals, communicators, and the general public to cultivate digital literacy skills and engage in ethical social media practices. This approach will improve individual and community health outcomes and contribute to the integrity and reliability of information in the digital space.

CHAPTER V

Appendices

Appendix A

This appendix includes the post-motivation categories used for manual coding for the first paper of this dissertation. Table A1 provides examples of post motivations per category.

Table A1

Post motivation categories for manual coding and examples of Milwaukee County FBSG posts

Motivation Category	Example
Provide information	<ol style="list-style-type: none"> 1. Not only is breastfeeding good for your baby, it's also good for you! #DYK breastfeeding can help you recover more quickly from childbirth. It's true! It can also reduce the risk of some ovarian and breast cancers. Learn more about the benefits of breastfeeding 2. Did you know? Breast size does not determine how much milk you can make! Large and small breasts can make the same amount of milk in a day! #BreastmilkProduction
Provide affirmation/ emotional support	<ol style="list-style-type: none"> 1. Take a minute to notice how your baby looks at you with love and remember that you are that little person's everything and you're doing a great job. 2. Hey you! Yes, you! Read this and believe it. Because it's true. Photo reads: The fact that you worry about being a good mom means you already are one.
Share experiences	<ol style="list-style-type: none"> 1. On my way to work, I realized that I left a part of my electric breast pump air drying next to the coffee maker. I was already running late so going back home was not an option. By noon my breasts were starting to feel full and uncomfortable. I hand expressed for comfort and put baby to breast as soon as I got home. Hand expression is an important skill for every new mom to know. Check this video out to learn the details. 2. Hey working moms! How are you making breastfeeding and working WORK for you? I remember being so sad to leave my baby and nervous about being able to pump for her when I went back to work. Here are some tips on talking to your employer about how and when you will pump. Remember-it's a law in the state of Wisconsin that employers are required to provide time (not necessarily paid) and space (that is NOT a bathroom) for moms to pump for one year after the birth of a baby. This is not a favor you are asking – it is required! Advocate for yourself, your baby, and other moms who work there too!
Ask questions	<ol style="list-style-type: none"> 1. Help! I have a question, I'm fully breastfeeding. I have very low energy I was wondering if it's safe to drink any type of energy drinks?

Motivation Category	Example
	<ol style="list-style-type: none"> 2. My love is having problems gaining weight since switching from EP to EBF. What can I do? 3. Can anyone else remember a time where knowing how to ahnd express saved the day?
Direct people to resources	<ol style="list-style-type: none"> 1. Good info on how/when/why to pump! Click on the link to see a short video from other moms about why they pump and what that means for them. 2. As baby grows, they may require more frequent feedings clustered together. This is known as “cluster feeding.” Learn more about cluster feeding and what to expect during baby’s growth spurts at

Appendix B

This appendix includes examples of elicitation questions of the focus groups for the second paper of the dissertation. Table B1 provides examples of questions that were asked in the participants’ and administrators’ focus groups.

Table B1

Focus Group Example Questions

Construct	Focus Group Questions
Experiential attitude	Why did you want to join a FBSG?
Instrumental attitude	What aspect of the FBSG do you find most beneficial?
Injunctive norm	Regarding your breastfeeding experience, what were some of weaknesses of the Facebook group in comparison to (1) other WIC support (e.g., lactation consultant, peer counselor, etc.), (2) healthcare professionals (e.g., hospital, doctors, nurses, midwife, health educator), and (3) non-WIC, non-healthcare professionals (e.g., family, friends, community groups, internet, etc.)?
Descriptive norm	Did you experience any conflict with other members of your group or with your group moderators? If so, how could it be avoided/handled in the future?
Perceived control	Have you commented on any of the posts made by the moderators or other moms? (1) If yes, what prompted you to do so, and how did you feel about it? (2) If no,

Construct	Focus Group Questions
Self-efficacy	<p>what could have made it easier for you to comment on the posts?</p> <hr/> <p>Have you posted any questions on your WIC breastfeeding support Facebook group? (1) If yes, what question did you post? How, or did, other members respond? Did you receive the support you were looking for? (2) If no, what could have made it easier for you to post your question without hesitation?</p>
Knowledge and skills	<p>What kind of content in the group would you like to see more of? (For example, more breastfeeding tips, more personal experiences, more product recommendations, more photos of other group members' babies)</p>
Environmental constraints/facilitators	<p>How did you hear about Wisconsin WIC FBSG?</p>

References

- Ahmed, A. H., & Rojjanasrirat, W. (2021). Breastfeeding Outcomes, Self-Efficacy, and Satisfaction Among Low-Income Women With Late-Preterm, Early-Term, and Full-Term Infants. *Journal of Obstetric, Gynecologic Neonatal Nursing*, 50(5), 583-596. <https://doi.org/10.1016/j.jogn.2021.06.010>
- Alianmoghaddam, N., Phibbs, S., & Benn, C. (2019). "I did a lot of Googling": A qualitative study of exclusive breastfeeding support through social media. *Women and Birth*, 32(2), 147-156. <https://doi.org/10.1016/j.wombi.2018.05.008>
- Anderson, I. K. (2011). The uses and gratifications of online care pages: a study of CaringBridge. *Health Communication*, 26(6), 546-559. <https://doi.org/10.1080/10410236.2011.558335>
- Angeletti, M. A., & Llossas, J. R. (2018). Workplace Lactation Programs in Small WIC Service Sites: A Potential Model. *Journal of Nutrition Education and Behavior*, 50(3), 307-310.e301. <https://doi.org/10.1016/j.jneb.2017.10.001>
- Azad, M. B., Vehling, L., Chan, D., Klopp, A., Nickel, N. C., McGavock, J. M., . . . Investigators, C. S. (2018). Infant Feeding and Weight Gain: Separating Breast Milk From Breastfeeding and Formula From Food. *Pediatrics*, 142(4). <https://doi.org/10.1542/peds.2018-1092>
- Ballou, J., Wiseman, C., Jackson, L., Godfrey, R., & Cagle, D. (2017). Lactation Skills Workshop: A Collaboration of the City of Dallas WIC and Local Hospitals. *Journal of Nutrition Education and Behavior*, 49(7 Suppl 2), S202-S206.e201. <https://doi.org/10.1016/j.jneb.2017.05.347>
- Barbosa, C. E., Masho, S. W., Carlyle, K. E., & Mosavel, M. (2017). Factors Distinguishing Positive Deviance Among Low-Income African American Women: A Qualitative Study on Infant Feeding. *Journal of Human Lactation*, 33(2), 368-378. <https://doi.org/10.1177/0890334416673048>
- Barnhart, B. (2022). *Social media demographics to inform your brand's strategy in 2022*. sprout social. Retrieved June from <https://sproutsocial.com/insights/new-social-media-demographics/#youtube-demographics>
- Bartle, N. C., & Harvey, K. (2017). Explaining infant feeding: The role of previous personal and vicarious experience on attitudes, subjective norms, self-efficacy, and breastfeeding outcomes. *British Journal of Health Psychology*, 22(4), 763-785. <https://doi.org/10.1111/bjhp.12254>
- Beggs, B., Koshy, L., & Neiterman, E. (2021). Women's Perceptions and Experiences of Breastfeeding: a scoping review of the literature. *BMC Public Health*, 21(1), 2169. <https://doi.org/10.1186/s12889-021-12216-3>

- Black, R., McLaughlin, M., & Giles, M. (2020). Women's experience of social media breastfeeding support and its impact on extended breastfeeding success: A social cognitive perspective. *British Journal of Health Psychology*, 25(3), 754-771. <https://doi.org/10.1111/bjhp.12451>
- Blyth, R., Creedy, D. K., Dennis, C. L., Moyle, W., Pratt, J., & De Vries, S. M. (2002). Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory. *Birth*, 29(4), 278-284. <https://doi.org/10.1046/j.1523-536x.2002.00202.x>
- Blyth, R. J., Creedy, D. K., Dennis, C. L., Moyle, W., Pratt, J., De Vries, S. M., & Healy, G. N. (2004). Breastfeeding duration in an Australian population: the influence of modifiable antenatal factors. *Journal of Human Lactation*, 20(1), 30-38. <https://doi.org/10.1177/0890334403261109>
- Bonia, K., Twells, L., Halfyard, B., Ludlow, V., Newhook, L. A., & Murphy-Goodridge, J. (2013). A qualitative study exploring factors associated with mothers' decisions to formula-feed their infants in Newfoundland and Labrador, Canada. *BMC Public Health*, 13, 645. <https://doi.org/10.1186/1471-2458-13-645>
- Bookhart, L. H., Anstey, E. H., Kramer, M. R., Perrine, C. G., Reis-Reilly, H., Ramakrishnan, U., & Young, M. F. (2022). A nation-wide study on the common reasons for infant formula supplementation among healthy, term, breastfed infants in US hospitals. *Matern & Child Nutrition*, 18(2), e13294. <https://doi.org/10.1111/mcn.13294>
- Boundy, E. O., Nelson, J. M., & Li, R. (2023). Public Belief in the Maternal Health Benefits of Breastfeeding - United States, 2018 and 2021. *Preventin Chronic Disease*, 20, E75. <https://doi.org/10.5888/pcd20.230010>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Braun, V., & Clarke, V. (2020). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 18(3), 328-352. <https://doi.org/10.1080/14780887.2020.1769238>
- Bridges, N. (2016). The faces of breastfeeding support: Experiences of mothers seeking breastfeeding support online. *Breastfeed Review*, 24(1), 11-20.
- Bridges, N., Howell, G., & Schmied, V. (2018). Exploring breastfeeding support on social media. *International Breastfeeding Journal*, 13, 22. <https://doi.org/10.1186/s13006-018-0166-9>

- Brown, C. R., Dodds, L., Legge, A., Bryanton, J., & Semenic, S. (2014). Factors influencing the reasons why mothers stop breastfeeding. *Canadian Journal of Public Health, 105*(3), e179-185.
<https://doi.org/10.17269/cjph.105.4244>
- Bunik, M., Krebs, N. F., Beaty, B., McClatchey, M., & Olds, D. L. (2009). Breastfeeding and WIC enrollment in the Nurse Family Partnership Program. *Breastfeed Medicine, 4*(3), 145-149.
<https://doi.org/10.1089/bfm.2008.0140>
- Burns, E., Schmied, V., Sheehan, A., & Fenwick, J. (2010). A meta-ethnographic synthesis of women's experience of breastfeeding. *Matern & Child Nutrition, 6*(3), 201-219. <https://doi.org/10.1111/j.1740-8709.2009.00209.x>
- Callen, J., & Pinelli, J. (2004). Incidence and duration of breastfeeding for term infants in Canada, United States, Europe, and Australia: a literature review. *Birth, 31*(4), 285-292. <https://doi.org/10.1111/j.0730-7659.2004.00321.x>
- Carlin, R. F., Mathews, A., Oden, R., & Moon, R. Y. (2019). The Influence of Social Networks and Norms on Breastfeeding in African American and Caucasian Mothers: A Qualitative Study. *Breastfeed Medicine, 14*(9), 640-647. <https://doi.org/10.1089/bfm.2019.0044>
- CDC, Centers for Disease Control and Prevention. (2024). *Breastfeeding*. Retrieved February from <https://www.cdc.gov/breastfeeding/index.htm>
- CDC, Centers for Disease Control and Prevention. (2020). *Breastfeeding Report Card United States, 2020*.
<https://www.cdc.gov/breastfeeding/data/reportcard.htm>
- CDC, Centers for Disease Control and Prevention. (2022). *Breastfeeding Report Card, United States 2022*. Retrieved June 22 from <https://www.cdc.gov/breastfeeding/data/reportcard.htm>
- CDC, Centers for Disease Control and Prevention. (2023). *Breastfeeding*. Retrieved September 25 from <https://www.cdc.gov/breastfeeding/index.htm>
- Chantry, C. J., Dewey, K. G., Peerson, J. M., Wagner, E. A., & Nommsen-Rivers, L. A. (2014). In-Hospital Formula Use Increases Early Breastfeeding Cessation Among First-Time Mothers Intending to Exclusively Breastfeed. *Journal of Pediatrics, 164*(6). <https://doi.org/10.1016/j.jpeds.2013.12.035>
- Chapman, D. J. (2013). Nudging more women to breastfeed: impact of public health policy changes. *Journal of Human Lactation, 29*(1), 15-16. <https://doi.org/10.1177/0890334412471939>

- Clapton-Caputo, E., Sweet, L., & Muller, A. (2021). A qualitative study of expectations and experiences of women using a social media support group when exclusively expressing breastmilk to feed their infant. *Women Birth, 34*(4), 370-380. <https://doi.org/10.1016/j.wombi.2020.06.010>
- Cohen, J. (1988). *Statistical power analysis for the behavior sciences*. West Publishing Company.
- Cooper, H., Reif, S., Shilling, S., & Wilson, E. (2021). Social media support group: Implementation and evaluation. *AIDS Care, 33*(4), 502-506. <https://doi.org/10.1080/09540121.2020.1748171>
- Cordero, L., Stenger, M. R., Landon, M. B., & Nankervis, C. A. (2019). In-hospital formula supplementation and breastfeeding initiation in infants born to women with pregestational diabetes mellitus. *Journal of Neonatal Perinatal Medicine, 12*(3), 285-293. <https://doi.org/10.3233/NPM-180140>
- Darfour-Oduro, S. A., & Kim, J. (2014). WIC mothers' social environment and postpartum health on breastfeeding initiation and duration. *Breastfeed Medicine, 9*(10), 524-529. <https://doi.org/10.1089/bfm.2014.0067>
- Davidson, E. L., & Ollerton, R. L. (2020). Partner behaviours improving breastfeeding outcomes: An integrative review. *Women Birth, 33*(1), e15-e23. <https://doi.org/10.1016/j.wombi.2019.05.010>
- de Souza, J., Calsinski, C., Chamberlain, K., Cibrian, F., & Wang, E. J. (2023). Investigating interactive methods in remote chestfeeding support for lactation consulting professionals in Brazil. *Frontiers in Digital Health, 5*, 1143528. <https://doi.org/10.3389/fdgth.2023.1143528>
- Dennis, C. L. (2003). The breastfeeding self-efficacy scale: psychometric assessment of the short form. *Journal of Obstetric, Gynecologic & Neonatal Nurse, 32*(6), 734-744. <https://doi.org/10.1177/0884217503258459>
- Dennis, C. L., & Faux, S. (1999). Development and psychometric testing of the Breastfeeding Self-Efficacy Scale. *Research in Nursing Health, 22*(5), 399-409. [https://doi.org/10.1002/\(sici\)1098-240x\(199910\)22:5<399::aid-nur6>3.0.co;2-4](https://doi.org/10.1002/(sici)1098-240x(199910)22:5<399::aid-nur6>3.0.co;2-4)
- DHS-WI, W. D. o. H. S. (2023). *WIC: Who is eligible?* Retrieved August from <https://www.dhs.wisconsin.gov/wic/income-guidelines.htm>
- Diaz, L. E., Yee, L. M., & Feinglass, J. (2023). Rates of breastfeeding initiation and duration in the United States: data insights from the 2016-2019 Pregnancy Risk Assessment Monitoring System. *Frontiers in Public Health, 11*, 1256432. <https://doi.org/10.3389/fpubh.2023.1256432>
- Dimes, M. o. (2022). *Population*. Retrieved August from <https://www.marchofdimes.org/peristats/data?reg=99&top=14&stop=125&lev=1&slev=1&obj=3>

- Dinour, L. M., & Szaro, J. M. (2017). Employer-Based Programs to Support Breastfeeding Among Working Mothers: A Systematic Review. *Breastfeeding Medicine*, *12*, 131-141.
<https://doi.org/10.1089/bfm.2016.0182>
- Dolan, R., Conduit, J., Frethey-Netham, C., Fahy, J., & Goodman, S. (2019). Social media engagement behavior. *European Journal of Marketing*. <https://www.emerald.com/insight/content/doi/10.1108/EJM-03-2017-0182/full/html>
- Doughty, K. N., & Taylor, S. N. (2021). Barriers and benefits to breastfeeding with gestational diabetes. *Seminars in Perinatology*, *45*(2), 151385. <https://doi.org/10.1016/j.semperi.2020.151385>
- Economou, M., Kolokotroni, O., Paphiti-Demetriou, I., Kouta, C., Lambrinou, E., Hadjigeorgiou, E., . . . Middleton, N. (2021). The association of breastfeeding self-efficacy with breastfeeding duration and exclusivity: longitudinal assessment of the predictive validity of the Greek version of the BSES-SF tool. *BMC Pregnancy and Childbirth*, *21*(1), 421. <https://doi.org/10.1186/s12884-021-03878-3>
- Edelblute, H. B., & Altman, C. E. (2021). The Interaction and Impact of Social Support and Father Absence on Breastfeeding. *Breastfeeding Medicine*, *16*(8), 629-634. <https://doi.org/10.1089/bfm.2020.0202>
- Entwistle, F., Kendall, S., & Mead, M. (2010). Breastfeeding support - the importance of self-efficacy for low-income women. *Maternal & Child Nutrition*, *6*(3), 228-242. <https://doi.org/10.1111/j.1740-8709.2009.00202.x>
- Flower, K. B., Willoughby, M., Cadigan, R. J., Perrin, E. M., Randolph, G., & Team, F. L. P. I. (2008). Understanding breastfeeding initiation and continuation in rural communities: a combined qualitative/quantitative approach. *Maternal and Child Health Journal*, *12*(3), 402-414.
<https://doi.org/10.1007/s10995-007-0248-6>
- Foster, S. F., Vazquez, C., Cubbin, C., Nichols, A. R., Rickman, R. R., & Widen, E. M. (2023). Breastfeeding, socioeconomic status, and long-term postpartum weight retention. *International Breastfeeding Journal*, *18*(1), 1. <https://doi.org/10.1186/s13006-022-00534-0>
- Francis, J., Mildon, A., Stewart, S., Underhill, B., Tarasuk, V., Di Ruggiero, E., . . . O'Connor, D. L. (2020). Vulnerable mothers' experiences breastfeeding with an enhanced community lactation support program. *Maternal & Child Nutrition*, *16*(3), e12957. <https://doi.org/10.1111/mcn.12957>

- García-Acosta, J. M., San Juan-Valdivia, R. M., Fernández-Martínez, A. D., Lorenzo-Rocha, N. D., & Castro-Peraza, M. E. (2019). Trans* Pregnancy and Lactation: A Literature Review from a Nursing Perspective. *International Journal of Environmental Research and Public Health*, 17(1).
<https://doi.org/10.3390/ijerph17010044>
- Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health Behavior: Theory, research, and practice* (Fifth Edition ed.). Jossey-Bass.
- Gleason, S., Wilkin, M. K., Sallack, L., Whaley, S. E., Martinez, C., & Paolicelli, C. (2020). Breastfeeding Duration Is Associated With WIC Site-Level Breastfeeding Support Practices. *Journal of Nutrition Education and Behavior*, 52(7), 680-687. <https://doi.org/10.1016/j.jneb.2020.01.014>
- Gonzalez-Nahm, S., & Benjamin-Neelon, S. E. (2023). Supporting breastfeeding equity: A cross-sectional study of US birthing facility administrators. *Preventive Medicine Reports*, 34, 102259.
<https://doi.org/10.1016/j.pmedr.2023.102259>
- Gross, S. M., Resnik, A. K., Cross-Barnet, C., Nanda, J. P., Augustyn, M., & Paige, D. M. (2009). The differential impact of WIC peer counseling programs on breastfeeding initiation across the state of Maryland. *Journal of Human Lactation*, 25(4), 435-443. <https://doi.org/10.1177/0890334409342070>
- Gyamfi, A., Spatz, D. L., Jefferson, U. T., Lucas, R., O'Neill, B., & Henderson, W. A. (2023). Breastfeeding Social Support Among African American Women in the United States: A Meta-Ethnography. *Advances in Neonatal Care*, 23(1), 72-80. <https://doi.org/10.1097/ANC.0000000000001021>
- Haider, S. J., Chang, L. V., Bolton, T. A., Gold, J. G., & Olson, B. H. (2014). An evaluation of the effects of a breastfeeding support program on health outcomes. *Health Services Research*, 49(6), 2017-2034.
<https://doi.org/10.1111/1475-6773.12199>
- Haller, J., David, M. P., Lee, N. E., Shalin, S. C., & Gardner, J. M. (2018). Impact of Pathologist Involvement in Sarcoma and Rare Tumor Patient Support Groups on Facebook: A Survey of 542 Patients and Family Members. *Archives of Pathology & Laboratory Medicine*, 142(9), 1113-1119.
<https://doi.org/10.5858/arpa.2017-0408-OA>
- Hamze, L., Carrick-Sen, D., Zhang, Z., Liu, Y., & Mao, J. (2018). Maternal attitude towards breastfeeding: A concept analysis. *British Journal of Midwifery*, 26(7), 462-469.
<https://doi.org/10.12968/bjom.2018.26.7.462>

- Hannula, L., Kaunonen, M., & Tarkka, M. T. (2008). A systematic review of professional support interventions for breastfeeding. *Journal of Clinical Nursing*, 17(9), 1132-1143. <https://doi.org/10.1111/j.1365-2702.2007.02239.x>
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3 ed.). The Guilford Press. Heck, K. E., Braveman, P., Cubbin, C., Chávez, G. F., & Kiely, J. L. (2006). Socioeconomic status and breastfeeding initiation among California mothers. *Public Health Reports*, 121(1), 51-59. <https://doi.org/10.1177/003335490612100111>
- Hedberg, I. C. (2013). Barriers to breastfeeding in the WIC population. *MCN The American Journal of Maternal Child Nursing*, 38(4), 244-249. <https://doi.org/10.1097/NMC.0b013e3182836ca2>
- Hendricks, K., Briefel, R., Novak, T., & Ziegler, P. (2006). Maternal and child characteristics associated with infant and toddler feeding practices. *Journal of the American Dietetic Association*, 106(1 Suppl 1), S135-148. <https://doi.org/10.1016/j.jada.2005.09.035>
- HHU, H. H. U. D. (2007). *G*power*. Retrieved December from <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>
- Hildebrand, D. A., McCarthy, P., Tipton, D., Merriman, C., Schrank, M., & Newport, M. (2014). Innovative use of influential prenatal counseling may improve breastfeeding initiation rates among WIC participants. *Journal of Nutrition Education and Behavior*, 46(6), 458-466. <https://doi.org/10.1016/j.jneb.2014.05.005>
- Hinsliff-Smith, K., Spencer, R., & Walsh, D. (2014). Realities, difficulties, and outcomes for mothers choosing to breastfeed: primigravid mothers experiences in the early postpartum period (6-8 weeks). *Midwifery*, 30(1), e14-19. <https://doi.org/10.1016/j.midw.2013.10.001>
- Hornsby, P. P., Gurka, K. K., Conaway, M. R., & Kellams, A. L. (2019). Reasons for Early Cessation of Breastfeeding Among Women with Low Income. *Breastfeeding Medicine*, 14(6), 375-381. <https://doi.org/10.1089/bfm.2018.0206>
- Hossain, S., & Mīhrshahi, S. (2022). Exclusive Breastfeeding and Childhood Morbidity: A Narrative Review. *International Journal of Environmental Research and Public Health*, 19(22). <https://doi.org/10.3390/ijerph192214804>

- Houghtaling, B., Byker Shanks, C., & Jenkins, M. (2017). Likelihood of Breastfeeding Within the USDA's Food and Nutrition Service Special Supplemental Nutrition Program for Women, Infants, and Children Population. *Journal of Human Lactation*, 33(1), 83-97. <https://doi.org/10.1177/0890334416679619>
- Houk, K. M., & Thornhill, K. (2013). Using Facebook Page Insights Data to Determine Posting Best Practices in an Academic Health Sciences Library. *Journal of Web Librarianship*, 7(4), 372-388. <https://doi.org/10.1080/19322909.2013.837346>
- Houlihan, A. E., Zaikman, Y., & Alford, A. M. (2023). The influence of bystander presence on evaluations of public breastfeeding among adults in the United States. *BMC Public Health*, 23(1), 1753. <https://doi.org/10.1186/s12889-023-16635-2>
- Hunt, L., Thomson, G., Whittaker, K., & Dykes, F. (2021). Adapting breastfeeding support in areas of socio-economic deprivation: a case study approach. *International Journal for Equity Health*, 20(1), 83. <https://doi.org/10.1186/s12939-021-01393-7>
- Ibarra-Ortega, A., Vásquez-Garibay, E. M., Larrosa-Haro, A., Castro-Albarrán, J., & Vizmanos-Lamotte, B. (2020). Using a lactation room at the workplace is associated with longer breastfeeding duration in working mothers. *Nutrición Hospitalaria*, 37(5), 918-925. <https://doi.org/10.20960/nh.03242>
- Ip, S., Chung, M., Raman, G., Trikalinos, T. A., & Lau, J. (2009). A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries. *Breastfeeding Medicine*, 4 Suppl 1, S17-30. <https://doi.org/10.1089/bfm.2009.0050>
- Ishii, K. (2008). Uses and gratifications of online communities in Japan. *Observatorio*.
- Jackson, J. E., & Hallam, J. (2021). Against all odds-why UK mothers' breastfeeding beyond infancy are turning to their international peers for emotional and informative support. *Health Care for Women International*, 42(4-6), 739-755. <https://doi.org/10.1080/07399332.2020.1744147>
- Jacobson, L. T., Twumasi-Ankrah, P., Redmond, M. L., Ablah, E., Hines, R. B., Johnston, J., & Collins, T. C. (2015). Characteristics associated with breastfeeding behaviors among urban versus rural women enrolled in the Kansas WIC program. *Maternal and Child Health Journal*, 19(4), 828-839. <https://doi.org/10.1007/s10995-014-1580-2>

- Jensen, E. (2012). Participation in the Supplemental Nutrition Program for Women, Infants and Children (WIC) and breastfeeding: national, regional, and state level analyses. *Matern and Child Health Journal*, 16(3), 624-631. <https://doi.org/10.1007/s10995-011-0796-7>
- Jones, K. M., Power, M. L., Queenan, J. T., & Schulkin, J. (2015). Racial and ethnic disparities in breastfeeding. *Breastfeeding Medicine*, 10(4), 186-196. <https://doi.org/10.1089/bfm.2014.0152>
- Katz, E., Blumler, J., & M., G. (1974). The Uses of Mass Communications: Current Perspectives on Gratifications Research. In *Utilization of Mass Communication by the Individual*. Sage Publications.
- Kaufman, L., Deenadayalan, S., & Karpati, A. (2010). Breastfeeding ambivalence among low-income African American and Puerto Rican women in north and central Brooklyn. *Matern and Child Health Journal*, 14(5), 696-704. <https://doi.org/10.1007/s10995-009-0499-5>
- Kaunonen, M., Hannula, L., & Tarkka, M. T. (2012). A systematic review of peer support interventions for breastfeeding. *Journal of Clinical Nursing*, 21(13-14), 1943-1954. <https://doi.org/10.1111/j.1365-2702.2012.04071.x>
- Kim, J. H., Fiese, B. H., & Donovan, S. M. (2017). Breastfeeding is Natural but Not the Cultural Norm: A Mixed-Methods Study of First-Time Breastfeeding, African American Mothers Participating in WIC. *Journal of Nutrition Education and Behavior*, 49(7 Suppl 2), S151-S161.e151. <https://doi.org/10.1016/j.jneb.2017.04.003>
- Kisekka, V., Han, W., & Sharman, R. (2014). Utilizing the uses and gratifications theory to understand patients use of online support groups. Americas Conference on Information Systems, Savannah, GA.
- Klemm, P. (2012). Effects of online support group format (moderated vs peer-led) on depressive symptoms and extent of participation in women with breast cancer. *Computers, Informatics, Nursing*, 30(1), 9-18. <https://doi.org/10.1097/NCN.0b013e3182343efa>
- Langellier, B. A., Pia Chaparro, M., & Whaley, S. E. (2012). Social and institutional factors that affect breastfeeding duration among WIC participants in Los Angeles County, California. *Maternal and Child Health Journal*, 16(9), 1887-1895. <https://doi.org/10.1007/s10995-011-0937-z>
- Lauer, E. A., Armenti, K., Henning, M., & Sirois, L. (2019). Identifying Barriers and Supports to Breastfeeding in the Workplace Experienced by Mothers in the New Hampshire Special Supplemental Nutrition Program for

- Women, Infants, and Children Utilizing the Total Worker Health Framework. *International Journal of Environmental Research and Public Health*, 16(4). <https://doi.org/10.3390/ijerph16040529>
- Lennon, T., Bakewell, D., & Willis, E. (2018). The Breastfeeding Employer Supported Time Project: Using a Mentor-Mentee-Based Approach to Establish Workplace Lactation Support in Milwaukee County. *Journal of Human Lactation*, 34(1), 47-50. <https://doi.org/10.1177/0890334417719246>
- Lepore, S. J., Buzaglo, J. S., Lieberman, M. A., Golant, M., Greener, J. R., & Davey, A. (2014). Comparing standard versus prosocial internet support groups for patients with breast cancer: a randomized controlled trial of the helper therapy principle. *Journal of Clinical Oncology*, 32(36), 4081-4086. <https://doi.org/10.1200/JCO.2014.57.0093>
- Lutenbacher, M., Karp, S. M., & Moore, E. R. (2016). Reflections of Black Women Who Choose to Breastfeed: Influences, Challenges and Supports. *Maternal and Child Health Journal*, 20(2), 231-239. <https://doi.org/10.1007/s10995-015-1822-y>
- Ma, P., & Magnus, J. H. (2012). Exploring the concept of positive deviance related to breastfeeding initiation in black and white WIC enrolled first time mothers. *Maternal and Child Health Journal*, 16(8), 1583-1593. <https://doi.org/10.1007/s10995-011-0852-3>
- Ma, X., Liu, J., & Smith, M. (2014). WIC participation and breastfeeding in South Carolina: updates from PRAMS 2009-2010. *Maternal and Child Health Journal*, 18(5), 1271-1279. <https://doi.org/10.1007/s10995-013-1362-2>
- Magnusson, B. M., Thackeray, C. R., Van Wagenen, S. A., Davis, S. F., Richards, R., & Merrill, R. M. (2017). Perceptions of Public Breastfeeding Images and Their Association With Breastfeeding Knowledge and Attitudes Among an Internet Panel of Men Ages 21-44 in the United States. *Journal of Human Lactation*, 33(1), 157-164. <https://doi.org/10.1177/0890334416682002>
- Mao, C. Y., Narang, S., & Lopreiato, J. (2012). Breastfeeding practices in military families: a 12-month prospective population-based study in the national capital region. *Military Medicine*, 177(2), 229-234. <https://doi.org/10.7205/milmed-d-11-00181>
- Marshall, C., Gavin, L., Bish, C., Winter, A., Williams, L., Wesley, M., & Zhang, L. (2013). WIC participation and breastfeeding among White and Black mothers: data from Mississippi. *Maternal and Child Health Journal*, 17(10), 1784-1792. <https://doi.org/10.1007/s10995-012-1198-1>

- McCann, M. F., Baydar, N., & Williams, R. L. (2007). Breastfeeding attitudes and reported problems in a national sample of WIC participants. *Journal of Human Lactation*, 23(4), 314-324.
<https://doi.org/10.1177/0890334407307882>
- McGowan, C., & Bland, R. (2023). The Benefits of Breastfeeding on Child Intelligence, Behavior, and Executive Function: A Review of Recent Evidence. *Breastfeeding Medicine*, 18(3), 172-187.
<https://doi.org/10.1089/bfm.2022.0192>
- Meek, J. Y., Noble, L., & Breastfeeding, S. o. (2022). Policy Statement: Breastfeeding and the Use of Human Milk. *Pediatrics*, 150(1). <https://doi.org/10.1542/peds.2022-057988>
- Meta. (2024). About advertising objectives. Retrieved May 1, 2024, from <https://www.facebook.com/business/help/299337950825000?id=203539221057259>
- Meyerink, R. O., & Marquis, G. S. (2002). Breastfeeding initiation and duration among low-income women in Alabama: the importance of personal and familial experiences in making infant-feeding choices. *Journal of Human Lactation*, 18(1), 38-45. <https://doi.org/10.1177/089033440201800106>
- Miller, J. D., Collins, S. M., Boateng, G. O., Widen, E. M., Natamba, B., Achoko, W., . . . Martin, S. L. (2022). Pathways linking social support, self-efficacy, and exclusive breastfeeding among women in northern Uganda. *Glob Public Health*, 17(12), 3506-3518. <https://doi.org/10.1080/17441692.2022.2110918>
- Mitchell-Box, K., Braun, K. L., Hurwitz, E. L., & Hayes, D. K. (2013). Breastfeeding attitudes: association between maternal and male partner attitudes and breastfeeding intent. *Breastfeeding Medicine*, 8(4), 368-373.
<https://doi.org/10.1089/bfm.2012.0135>
- Mitra, A. K., Khoury, A. J., Hinton, A. W., & Carothers, C. (2004). Predictors of breastfeeding intention among low-income women. *Maternal and Child Health Journal*, 8(2), 65-70.
<https://doi.org/10.1023/b:maci.0000025728.54271.27>
- Moon, H., & Woo, K. (2021). An integrative review on mothers' experiences of online breastfeeding peer support: Motivations, attributes and effects. *Maternal & Child Nutrition*, 17(3), e13200.
<https://doi.org/10.1111/mcn.13200>
- Moon, R. Y., Mathews, A., Oden, R., & Carlin, R. (2019). Mothers' Perceptions of the Internet and Social Media as Sources of Parenting and Health Information: Qualitative Study. *Journal of Medical Internet Research*, 21(7), e14289. <https://doi.org/10.2196/14289>

- Moore, R. E., Xu, L. L., & Townsend, S. D. (2021). Prospecting Human Milk Oligosaccharides as a Defense Against Viral Infections. *ACS Infectious Disease*, 7(2), 254-263.
<https://doi.org/10.1021/acsinfecdis.0c00807>
- Mora, A. d. I., Russell, D. W., Dungy, C. I., Losch, M., & Dusdieker, L. (1999). The Iowa Infant Feeding Attitude Scale: Analysis of Reliability and Validity. *Journal of Applied Social Psychology*, 29(11), 2362-2380.
<https://doi.org/10.1111/j.1559-1816.1999.tb00115.x>
- Morse, H., & Brown, A. (2021). Accessing local support online: Mothers' experiences of local Breastfeeding Support Facebook groups. *Maternal & Child Nutrition*, 17(4), e13227. <https://doi.org/10.1111/mcn.13227>
- Morse, H., & Brown, A. (2022). Mothers' experiences of using Facebook groups for local breastfeeding support: Results of an online survey exploring midwife moderation. *PLOS Digital Health*, 1(11), e0000144.
<https://doi.org/10.1371/journal.pdig.0000144>
- Morse, H., & Brown, A. (2022b). The benefits, challenges and impracts of accessing social media group support for breastfeeding: A systematic review. *Maternal & Child Nutrition*, 18(4), e13399.
<https://doi.org/10.1111/mcn.13399>
- Moukarzel, S., Rehm, M., & Daly, A. J. (2020). Breastfeeding promotion on Twitter: A social network and content analysis approach. *Matern Child Nutr*, 16(4), e13053. <https://doi.org/10.1111/mcn.13053>
- Munblit, D., Crawley, H., Hyde, R., & Boyle, R. J. (2020). Health and nutrition claims for infant formula are poorly substantiated and potentially harmful. *BMJ*, 369, m875. <https://doi.org/10.1136/bmj.m875>
- Niela-Vilén, H., Axelin, A., Melender, H. L., & Salanterä, S. (2015). Aiming to be a breastfeeding mother in a neonatal intensive care unit and at home: a thematic analysis of peer-support group discussion in social media. *Maternal & Child Nutrition*, 11(4), 712-726. <https://doi.org/10.1111/mcn.12108>
- Nobari, T. Z., Jiang, L., Wang, M. C., & Whaley, S. E. (2017). Baby-Friendly Hospital Initiative and Breastfeeding Among WIC-Participating Infants in Los Angeles County. *Journal of Hum Lactation*, 33(4), 677-683.
<https://doi.org/10.1177/0890334417716118>
- Office of Disease Prevention and Health Promotion (ODPHP). (2024). *Breastfeeding. Healthy People 2030*. Retrieved February from <https://health.gov/healthypeople/search?query=breastfeeding>

- Ogbo, F. A., Akombi, B. J., Ahmed, K. Y., Rwabilimbo, A. G., Ogbo, A. O., Uwaibi, N. E., . . . On Behalf Of The Global Maternal And Child Health Research Collaboration GloMACH. (2020). Breastfeeding in the Community-How Can Partners/Fathers Help? A Systematic Review. *International Journal of Environmental Research and Public Health*, 17(2). <https://doi.org/10.3390/ijerph17020413>
- Olson, B. H., Haider, S. J., Vangjel, L., Bolton, T. A., & Gold, J. G. (2010). A quasi-experimental evaluation of a breastfeeding support program for low income women in Michigan. *Maternal and Child Health Journal*, 14(1), 86-93. <https://doi.org/10.1007/s10995-008-0430-5>
- Payton, C., Romney, M., Olson, B. H., Abatemarco, D. J., M., L., & Leader, A. E. (2019). Evaluation of workplace lactation support among employers in two Pennsylvania cities. *Business Horizons*, 62(5), 579-587. <https://doi.org/https://doi.org/10.1016/j.bushor.2018.10.002>
- Pérez-Escamilla, R. (2012). Breastfeeding social marketing: lessons learned from USDA's "Loving Support" campaign. *Breastfeeding Medicine*, 7(5), 358-363. <https://doi.org/10.1089/bfm.2012.0063>
- Pérez-Escamilla, R. (2020). Breastfeeding in the 21st century: How we can make it work. *Social Science & Medicine*, 244, 112331. <https://doi.org/10.1016/j.socscimed.2019.05.036>
- Pérez-Escamilla, R., Tomori, C., Hernández-Cordero, S., Baker, P., Barros, A. J. D., Bégin, F., . . . Group, L. B. S. (2023). Breastfeeding: crucially important, but increasingly challenged in a market-driven world. *Lancet*, 401(10375), 472-485. [https://doi.org/10.1016/S0140-6736\(22\)01932-8](https://doi.org/10.1016/S0140-6736(22)01932-8)
- Pitts, A., Faucher, M. A., & Spencer, R. (2015). Incorporating breastfeeding education into prenatal care. *Breastfeeding Medicine*, 10(2), 118-123. <https://doi.org/10.1089/bfm.2014.0034>
- Qiao, J., Dai, L. J., Zhang, Q., & Ouyang, Y. Q. (2020). A Meta-Analysis of the Association Between Breastfeeding and Early Childhood Obesity. *Journal of Pediatric Nursing*, 53, 57-66. <https://doi.org/10.1016/j.pedn.2020.04.024>
- Radzynski, S., & Callister, L. C. (2015). Health Professionals' Attitudes and Beliefs About Breastfeeding. *Journal of Perinatal Education*, 24(2), 102-109. <https://doi.org/10.1891/1058-1243.24.2.102>
- Radzynski, S., & Callister, L. C. (2016). Mother's Beliefs, Attitudes, and Decision Making Related to Infant Feeding Choices. *Journal of Perinatal Education*, 25(1), 18-28. <https://doi.org/10.1891/1058-1243.25.1.18>
- Rasmussen, K. M., Latulippe, M. E., Yaktine, A. L., & editors. (2016). *Review of WIC Food Packages: Proposed Framework for Revisions: Interim Report*. National Academies Press.

- Regan, P., & Ball, E. (2013). Breastfeeding mothers' experiences: the ghost in the machine. *Qualitative Health Research*, 23(5), 679-688. <https://doi.org/10.1177/1049732313481641>
- Regan, S., & Brown, A. (2019). Experiences of online breastfeeding support: Support and reassurance versus judgement and misinformation. *Maternal & Child Nutrition*, 15(4), e12874. <https://doi.org/10.1111/mcn.12874>
- Renfrew, M. J., McCormick, F. M., Wade, A., Quinn, B., & Dowswell, T. (2012). Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database of Systematic Reviews*, 5(5), CD001141. <https://doi.org/10.1002/14651858.CD001141.pub4>
- Rhodes, E. C., Damio, G., LaPlant, H. W., Trymbulak, W., Crummett, C., Surprenant, R., & Pérez-Escamilla, R. (2021). Promoting equity in breastfeeding through peer counseling: the US Breastfeeding Heritage and Pride program. *International Journal of Equity in Health*, 20(1), 128. <https://doi.org/10.1186/s12939-021-01408-3>
- Robinson, A., Davis, M., Hall, J., Lauckner, C., & Anderson, A. K. (2019). It Takes an E-Village: Supporting African American Mothers in Sustaining Breastfeeding Through Facebook Communities. *Journal of Human Lactation*, 35(3), 569-582. <https://doi.org/10.1177/0890334419831652>
- Robinson, A., Lauckner, C., Davis, M., Hall, J., & Anderson, A. K. (2019). Facebook support for breastfeeding mothers: A comparison to offline support and associations with breastfeeding outcomes. *Digital Health*, 5, 2055207619853397. <https://doi.org/10.1177/2055207619853397>
- Rosen-Carole, C., Halterman, J., Baldwin, C. D., Martin, H., Goldstein, N. P. N., Allen, K., . . . Dozier, A. (2022). Prenatal Provider Breastfeeding Toolkit: Results of a Pilot to Increase Women's Prenatal Breastfeeding Support, Intentions, and Outcomes. *Journal of Human Lactation*, 38(1), 64-74. <https://doi.org/10.1177/08903344211008797>
- Rowe, S. (2015). *Breastfeeding self-efficacy in a sample of WIC participants* [Gardner-Webb University]. https://digitalcommons.gardner-webb.edu/nursing_etd/214
- Rubin, A. M. (2002). The uses-and-gratifications perspective of media effects. In *Media effects: Advances in theory and research* (pp. 525-548). Lawrence Erlbaum Associates.
- Rubin, A. M. (2009). Uses-and-gratifications perspective on media effect. In (Third Edition ed.). Routledge.

- Ryan, A. S., & Zhou, W. (2006). Lower breastfeeding rates persist among the Special Supplemental Nutrition Program for Women, Infants, and Children participants, 1978-2003. *Pediatrics*, *117*(4), 1136-1146. <https://doi.org/10.1542/peds.2005-1555>
- Sandhi, A., Lee, G. T., Chipojola, R., Huda, M. H., & Kuo, S. Y. (2020). The relationship between perceived milk supply and exclusive breastfeeding during the first six months postpartum: a cross-sectional study. *International Breastfeeding Journal*, *15*(1), 65. <https://doi.org/10.1186/s13006-020-00310-y>
- Segura-Pérez, S., Hromi-Fiedler, A., Adnew, M., Nyhan, K., & Pérez-Escamilla, R. (2021). Impact of breastfeeding interventions among United States minority women on breastfeeding outcomes: a systematic review. *International Journal for Equity Health*, *20*(1), 72. <https://doi.org/10.1186/s12939-021-01388-4>
- Segura-Pérez, S., Richter, L., Rhodes, E. C., Hromi-Fiedler, A., Vilar-Compte, M., Adnew, M., . . . Pérez-Escamilla, R. (2022). Risk factors for self-reported insufficient milk during the first 6 months of life: A systematic review. *Maternal & Child Nutrition*, *18* Suppl 3(Suppl 3), e13353. <https://doi.org/10.1111/mcn.13353>
- Shahbaznezhad, H., Dolan, R., & Rashidirad, M. (2021). The role of Social Media Content Format and Platform in Users; Engagement Behavior. *Journal of Interactive Marketing*, *53*, 47-65. <https://doi.org/10.1016/j.intmar.2020.05>.
- Shim, J. E., Kim, J., & Heiniger, J. B. (2012). Breastfeeding duration in relation to child care arrangement and participation in the special supplemental nutrition program for women, infants, and children. *Journal of Human Lactation*, *28*(1), 28-35. <https://doi.org/10.1177/0890334411424728>
- Skelton, K., Evans, R., & LaChenaye, J. (2020). Hidden Communities of Practice in Social Media Groups: Mixed Methods Study. *JMIR Pediatr Parent*, *3*(1), e14355. <https://doi.org/10.2196/14355>
- Skelton, K. R., Evans, R., LaChenaye, J., Amsbary, J., Wingate, M., & Talbott, L. (2018). Exploring Social Media Group Use Among Breastfeeding Mothers: Qualitative Analysis. *JMIR Pediatrics and Parenting*, *1*(2), e11344. <https://doi.org/10.2196/11344>
- Skouteris, H., & Savaglio, M. (2021). The Use of Social Media for Preconception Information and Pregnancy Planning among Young Women. *Journal of Clinical Medicine*, *10*(9). <https://doi.org/10.3390/jcm10091892>
- Sriraman, N. K., & Kellams, A. (2016). Breastfeeding: What are the Barriers? Why Women Struggle to Achieve Their Goals. *Journal of Women's Health (Larchmt)*, *25*(7), 714-722. <https://doi.org/10.1089/jwh.2014.5059>

- Stellefson, M., Paige, S. R., Chaney, B. H., & Chaney, J. D. (2020). Evolving Role of Social Media in Health Promotion: Updated Responsibilities for Health Education Specialists. *International Journal of Environmental Research and Public Health*, 17(4). <https://doi.org/10.3390/ijerph17041153>
- Taveras, E. M., Li, R., Grummer-Strawn, L., Richardson, M., Marshall, R., Rêgo, V. H., . . . Lieu, T. A. (2004a). Mothers' and clinicians' perspectives on breastfeeding counseling during routine preventive visits. *Pediatrics*, 113(5), e405-411. <https://doi.org/10.1542/peds.113.5.e405>
- Taveras, E. M., Li, R., Grummer-Strawn, L., Richardson, M., Marshall, R., Rêgo, V. H., . . . Lieu, T. A. (2004b). Opinions and practices of clinicians associated with continuation of exclusive breastfeeding. *Pediatrics*, 113(4), e283-290. <https://doi.org/10.1542/peds.113.4.e283>
- The American College of Obstetricians and Gynecologists (ACOG). (2021). *Barriers to Breastfeeding: Supporting Initiation and Continuation of Breastfeeding*. American College of Obstetricians and Gynecologists. Retrieved October from <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2021/02/barriers-to-breastfeeding-supporting-initiation-and-continuation-of-breastfeeding>
- Thoma, M. E., De Silva, D. A., Kim, J., Hodges, L., & Guthrie, J. (2023). Breastfeeding Initiation Trends by Special Supplemental Nutrition Program for Women, Infants, and Children Participation and Race/Ethnicity Among Medicaid Births. *Journal of Nutrition Education and Behavior*, 55(3), 170-181. <https://doi.org/10.1016/j.jneb.2022.09.006>
- Tomfohrde, O., J., & Reinke, J., S. (2016). Breastfeeding mothers' use of technology while breastfeeding. *Computers in Human Behavior*, 64, 556-561. <https://doi.org/https://doi.org/10.1016/j.chb.2016.07.057>
- Tschiderer, L., Willeit, P., & Peters, S. A. E. (2022). The cardiovascular benefits of breastfeeding to mothers. *Expert Review of Cardiovascular Therapy*, 20(8), 589-592. <https://doi.org/10.1080/14779072.2022.2100761>
- USDA, U. S. D. o. A. F. a. N. S. (2023). *WIC Breastfeeding Data Local Agency Report, FY 2022 Report*. <https://fns-prod.azureedge.us/sites/default/files/resource-files/FY2022-BFDLA-Report.pdf>
- U.S. Department of Health and Human Services. (2011). The Surgeon General's Call to Action to Support Breastfeeding. In. <https://www.ncbi.nlm.nih.gov/books/NBK52691/>
- Uzunçakmak, T., Gökşin, İ., & Ayaz-Alkaya, S. (2022). The effect of social media-based support on breastfeeding self-efficacy: a randomised controlled trial. *The European Journal of Contraception & Reproductive Health Care*, 27(2), 159-165. <https://doi.org/10.1080/13625187.2021.1946500>

- Ventura, A., Hupp, M., & Lavond, J. (2021). Mother-infant interactions and infant intake during breastfeeding versus bottle-feeding expressed breast milk. *Maternal & Child Nutrition*, 17(4), e13185.
<https://doi.org/10.1111/mcn.13185>
- Victora, C. G., Bahl, R., Barros, A. J., França, G. V., Horton, S., Krasevec, J., . . . Group, L. B. S. (2016). Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*, 387(10017), 475-490. [https://doi.org/10.1016/S0140-6736\(15\)01024-7](https://doi.org/10.1016/S0140-6736(15)01024-7)
- Von Haefen, I., Fishbein, M., Kasprzyk, D., & Montano, D. (2000). Acting on one's intentions: Variations in condom use intentions and behaviours as a function of type of partner, gender, ethnicity and risk. *Psychology, Health & Medicine*, 5(2), 163-171. <https://doi.org/10.1080/713690182>
- Wagg, A. J., Callanan, M. M., & Hassett, A. (2018). The use of computer mediated communication in providing patient support: A review of the research literature. *International Journal of Nursing Studies*, 82, 68-78.
<https://doi.org/10.1016/j.ijnurstu.2018.03.010>
- Wagg, A. J., Callanan, M. M., & Hassett, A. (2019). Online social support group use by breastfeeding mothers: A content analysis. *Heliyon*, 5(3), e01245. <https://doi.org/10.1016/j.heliyon.2019.e01245>
- WHO, World Health Organization. (2023). *Breastfeeding*. Retrieved September 25 from https://www.who.int/health-topics/breastfeeding#tab=tab_1
- WHO, World Health Organization. (2024). *Breastfeeding*. Retrieved February from https://www.who.int/health-topics/breastfeeding#tab=tab_1
- WIC. (2021). *Fiscal Year 2020 WIC Breastfeeding Data Local Agency Report*. In <https://www.fns.usda.gov/wic/wic-breastfeeding-data-local-agency-report>
- Wilson, J. C. (2020). Using Social Media for Breastfeeding Support. *Nursing for Women's Health*, 24(5), 332-343.
<https://doi.org/10.1016/j.nwh.2020.07.003>
- Yun, S., Liu, Q., Mertzlufft, K., Kruse, C., White, M., Fuller, P., & Zhu, B. P. (2010). Evaluation of the Missouri WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) breast-feeding peer counselling programme. *Public Health Nutrition*, 13(2), 229-237.
<https://doi.org/10.1017/S1368980009990668>

- Zaikman, Y., & Houlihan, A. E. (2022). It's just a breast: an examination of the effects of sexualization, sexism, and breastfeeding familiarity on evaluations of public breastfeeding. *BMC Pregnancy Childbirth*, 22(1), 122. <https://doi.org/10.1186/s12884-022-04436-1>
- Zhang, Q., Chen, C., Xue, H., Park, K., & Wang, Y. (2021). Revisiting the Relationship between WIC Participation and Breastfeeding among Low-Income Children in the U.S. after the 2009 WIC Food Package Revision. *Food Policy*, 101. <https://doi.org/10.1016/j.foodpol.2021.102089>
- Zhang, Q., Lamichhane, R., Wright, M., McLaughlin, P. W., & Stacy, B. (2019). Trends in Breastfeeding Disparities in US Infants by WIC Eligibility and Participation. *Journal of Nutrition Education and Behavior*, 51(2), 182-189. <https://doi.org/10.1016/j.jneb.2018.10.005>
- Ziol-Guest, K. M., & Hernandez, D. C. (2010). First- and second-trimester WIC participation is associated with lower rates of breastfeeding and early introduction of cow's milk during infancy. *Journal of the American Dietetic Association*, 110(5), 702-709. <https://doi.org/10.1016/j.jada.2010.02.013>