Clinical Research Report

Assessing Predictive Power of Psychosocial Factors on Breastfeeding Behavior of Mothers Attending Postnatal Clinics in Western Kenya

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Abstract: *This cross-sectional study aimed at determining predictive power of psychosocial factors influencing breastfeeding behavior of breastfeeding mothers. The study was conducted from April to August 2010 in Kakamega Central District within 4 postnatal clinics that were purposively sampled. Proportionate stratified technique was employed to obtain 230 respondents. A structured questionnaire was used to collect quantitative data where exploratory factor analysis tested dimensionality of questions, whereas skewness and kurtosis assessed normality of data. Structural equation modeling determined predictive power of latent variables. The model fitted data acceptably well, $\chi^2 = 156$, P < .001, Tucker–Lewis index = .93, comparative fit index = .95, root mean square error of approximation = .090, Hoelter's critical N (0.01 = 230), with regard to breastfeeding behavior. Regression weights showed predictive power for maternal attitude (β = .38, P < .01), subjective norm (β = .25, P < .05), perceived behavioral control (β = .25, P < .05), and intention (β = .95, P < .001). This study provides information on a better approach for promoting optimal breastfeeding that will increase initiation, exclusivity, and breastfeeding continuation rates.*

Keywords: breastfeeding behavior; psychosocial factors; theory of planned behavior; predictive power; breastfeeding mothers

Health professionals' support has been reported to be a crucial motivational factor in promoting breastfeeding behavior; however, evidence suggests this is not basically the case.[1] For breastfeeding mothers to be inspired to practice breastfeeding behavior through the routine support offered during postnatal clinics, the optimal balance among psychosocial factors must be achieved.[1] These psychosocial factors—maternal attitude, subjective norm, and perceived behavioral control—are predictors of breastfeeding intention.[2] Breastfeeding intention is a significant predictor of breastfeeding behavior, which can be optimal or suboptimal. Studies have described many factors associated with the intention to breastfeed.[3-6] These factors include maternal age, mother's education level, family household income, mother's knowledge on breastfeeding, previous breastfeeding

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experience, attitude toward breastfeeding, and mother's social support network. Understanding factors associated with intention to breastfeed allows health professionals plan and evaluate appropriate interventions to improve breastfeeding initiation and duration.[7] In Kenya, of all mothers 52% initiate breastfeeding within the first hour of birth, 13% exclusively breastfeed for 4 to 6 months, and 57% continue breastfeeding through the first year.[8-10] In Western Kenya, 30.7% of mothers initiate breastfeeding within the first hour of birth, 21.7% exclusively breastfeed for 6 months, and 27.5% continue breastfeeding to the first year.[10] This variability in breastfeeding behavior is significantly influenced by maternal attitude, social pressures, and control factors.[11,12]

Mother's appreciation of breastfeeding and perceived benefits of breastfeeding are the factors that increase favorable attitude toward optimal breastfeeding intention.[13] Previous studies have also supported maternal attitude to be a significant predictor of breastfeeding intention.[1,14,15] However, maternal attitude independently cannot optimally influence breastfeeding behavior without the social support of the people significant to the breastfeeding mother.[16-18] Mothers who receive encouragement to breastfeed from health care providers are more likely to initiate and maintain breastfeeding when compared with those who do not receive any breastfeeding support.[19,20] Studies have shown a variety of beliefs, traditions, culture, and economic reasons that facilitate or impede breastfeeding behavior.[21-23] As a health behavior, breastfeeding decision is therefore guided not only by mother's own underlying attitudes, skills, and beliefs but also by the perception of what other people think. Strong opinions on evaluation of whether breastfeeding behavior is good or bad for the mother/infant or both and beliefs about the breastfeeding process such as for how long mothers should breastfeed are still held.[24,25] These beliefs are social norms and imply what constitutes appropriate behavior.[26]

Cognitive models provide a useful framework for studying social norms, maternal attitude, and beliefs that constitute psychosocial factors in relation to breastfeeding behavior, and some studies have applied the Theory of Planned Behavior (TPB) to breastfeeding.[13,27,28] To date little is known on the way these psychosocial factors can be perceived, measured, and applied in an African setting, especially among mothers of Western Kenya, since most studies have been done on mothers in the developed countries. Moreover, the routine instruction-based approaches currently being used in our postnatal clinics to support rates of initiation, exclusivity, and continuation lack the theoretical basis to understand cognitive and experiential aspects that manipulate mother's intention to optimally breastfeed.[23,29] The aim of this article was to assess the predictive power of psychosocial factors that include maternal attitude, subjective norm, perceived behavioral control, and intention on breastfeeding behavior of mothers and develop a strategy for promoting this behavior in Kakamega Central, Kenya.

Methods and Data

Study Framework

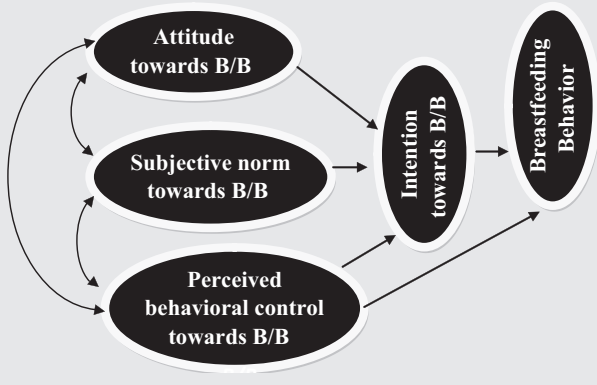
The study adapted Ajzen's TPB model (Figure 1) to fit psychosocial factors that influence optimal breastfeeding. The TPB model works on the basis that the approach to target behavior is to assess behavioral intention, which in turn is seen to be an operation of 4 exogenous variables: attitudes, subjective norm, perceived control, and intention. In this context, maternal attitude was the certainty about likely outcomes of optimal breastfeeding multiplied by evaluation of these outcomes (behavioral beliefs). Subjective norm was the belief of the breastfeeding mother over important people in her life that may or may not have influenced her to optimally breastfeed multiplied by the level of compliance to such influences (normative beliefs). Perceived behavioral control was viewed as control factors to promote or inhibit the breastfeeding mother to optimally breastfeed multiplied by the power she had over those factors (control beliefs). Perceived behavioral control was measured both directly and indirectly since breastfeeding is not under completely volitional control. Therefore, attitude and subjective norm were posited to have influenced breastfeeding behavior indirectly through breastfeeding intention. While perceived behavioral control both indirectly and directly manipulated breastfeeding behavior, the immediate antecedent of behavior, intention, was described as a behavioral tendency that captured the motivational factors that had an impact on behavior.[30] The latent variables can also be endogenous since they depend on observed variables to be measured, whereas observed variables can be exogenous since they are independent variables. When a variable is believed to "cause" another variable, the relationship between the variables is shown as a directed arrow, from cause to effect. Whether one variable "causes" another is an assumption that the researcher makes and only data can reveal. Covariation between 2 variables is shown as a 2-headed arrow connecting the variables. As a theory of competency and mastery, psychosocial factors influencing optimal breastfeeding describe that initiation and persistence toward the behavior are determined primarily by mother's breastfeeding cognitive judgments and expectations concerning her ability to perform the behavior. Although the TPB model provides a multifaceted approach in understanding the motivational impact of routine instruction, there was a need to explore further this theory in breastfeeding behavior among breastfeeding mothers attending postnatal clinics.

To comprehend breastfeeding behavior using the TPB model, an elicitation study was initially conducted prior to the current study to elicit salient beliefs on which exogenous variables are based. This was then employed to construct a questionnaire, which was pretested and used to assess the influence of these psychosocial factors on breastfeeding behavior (see Figure 1). Five research questions were examined:

1. What is the goodness of fit of a nested model linking mothers'

Figure 1.

A Path Diagram of Theory of Planned Behavior Model.



Abbreviation: B/B, breastfeeding behavior.
Source: Adapted and modified from Ajzen.[31]

attitude, subjective norm, and perceived behavioral control on breastfeeding behavior?

2. What is the predictive power of mothers' attitude on breastfeeding behavior?
3. What is the predictive power of mothers' subjective norm/social pressure on breastfeeding behavior?
4. What is the predictive power of mothers' perceived behavioral control on breastfeeding behavior?
5. What is the predictive power of mothers' breastfeeding intention on breastfeeding behavior?

Study Area and Design

The study was conducted within Kakamega Central located in Western Kenya where breastfeeding behavior was suboptimal among mothers attending postnatal clinics. Four postnatal clinics from a hospital, dispensary, nursing home, and home-based clinic formed the study site. The clinics from which the participants were selected from had been accredited as a Baby Friendly Hospital Initiative, a joint World Health Organization and United Nations Children's Fund global initiative that emphasizes the health benefits of breastfeeding. This cross-sectional study was conducted between April and August 2010 among breastfeeding mothers attending postnatal clinics in Kakamega Central district of Western Kenya. Permission was obtained from the School of Graduate Studies. Ethical approval was given by National Council for Science and Technology. Research authorization was granted by the Ministry of Public Health and Sanitation. We sought informed consent from the respondents who were informed on the research procedures, details, and assured of confidentiality.

Sample Criteria and Sampling Techniques

Sampling procedures involved selection of clinics and mothers. Sample criteria included both primiparous and multiparous mothers, those who had been attending prenatal clinics before delivery, had a healthy term singleton infant with birth weight of more than 2500 g on discharge from health center or home-based clinic, who had a child growth monitoring card, and who were breastfeeding. The study excluded mothers who were not within the reproductive age bracket of 18 to 40 years due to reported health complications and limitation of resources. Mothers who suffered chronic diseases and those on regular medication were ineligible due to their compromised immunity and metabolic patterning demands owing to afferent signals that indirectly affected breastfeeding unlike the healthy mothers. Moreover, mothers who had missed 2 consecutive postnatal sessions before the commencement of data collection were also not eligible for the study since they had neglected the maternal child health regulations as well as missed essential breastfeeding instructions. Participation in the study was voluntary although 4% (9) of respondents dropped out of the study due to unavoidable circumstances but were immediately replaced through a random sampling procedure performed on eligible participants. The respondents were not compensated for taking part in the study but were highly appreciated and given a debriefing letter after completion of the interview sessions.

Purposive sampling was used to identify 4 clinics for the study with the target that they offered postnatal services to breastfeeding mothers and were accreditation by the Baby Friendly Hospital Initiative. Proportionate stratified sampling was used to get the sample size of respondents from each stratum of hospital (167), dispensary (34), nursing home (17), and home-based clinic (12). Random sampling was then employed on each stratum depending on its size to get the final study sample size of N = 230.

Data Collection Instrument

Data collection was conducted from April to August 2010 by the main researcher and 2 trained research assistants. A 7-point Likert-type scale breastfeeding behavior questionnaire was used to collect the quantitative data. The breastfeeding behavior questionnaire was developed and written in English language but was translated into *Luhyia* and *Kiswahili* and then back-translated into English by 4 language experts to ensure that the meaning was not lost during a 5-day training of research assistants. Experts' judgment was used to confirm the translation into local languages. Three language experts of *Luhyia*, *Kiswahili*, and English were given the tools to translate into local

language and again back-translate them into English or *Kiswahili*. Not much difference was noted during this process. Translation into local language *Luhyia* was only required when a mother could not understand English or *Kiswahili*, the national language. The study used a total of 7 language experts for translation purposes. Both convergent and divergent validity were determined by comparing answers to each question measuring the same concept, then by measuring this answer to the respondent's response to a question that asks for the exact opposite answer. Back-translation was also done to check for reliability of the translation. The pretested questionnaire was acceptable based on factor analysis criteria used and concepts of measurements loading with communalities for each item being greater than .5. This questionnaire was acceptable having confirmed adequacy of sample size (N = 230) using test of sphericity. The internal consistency estimates of the various concepts, using Cronbach's α, ranged from .64 to .89 (see Table 1). The closer the Cronbach's α coefficient is to 1.0 the greater the internal consistency of the items in the scale. George and Mallery's rule of thumb was used to classify the Cronbach's α coefficients generated.[32] According to the rule of thumb, >.9 is excellent, >.8 is good, >.7 is acceptable, >.6 is questionable, >.5 is poor, and >.4 is unacceptable. High values for Cronbach's α indicate good internal consistency of the items in the scales but does not necessarily signify that the scale is one dimensional. Consequently, factor analysis was performed to establish the dimensionality of scales in the questionnaire before fitting into structural equation modeling.

Statistical Methods

Data was entered into SPSS version 15 to calculate for reliability tests where Cronbach's α was used to assess the consistency of the questions. Values of Cronbach's α were computed to evaluate the internal consistency of the attitudinal beliefs, social influences, control beliefs, and intention scores (see Table 1). Exploratory factor analysis was applied to test for the dimensionality of the questions measuring the same concepts. The response of respondents for each question was distinctive, and rotated component factors loading for each variable was subjected to principal component analysis (see Table 2). George and Mallery's rule of thumb was employed to categorize the average of communalities of maternal attitude, subjective norm, perceived behavioral control, and intention.[32] To establish whether the model nested based on TPB variables applied to breastfeeding behavior fitted the data acceptably well, structural equation modeling using AMOS version 7 was conducted. It was essential first to base the measurement model on the original concepts of TPB in order to answer the 5 research questions. Both item measurement analysis and measurement model analysis were performed using observed and unobserved variables in an attempt to assess the extent to which the model fits the data. A confirmatory factor analysis was conducted specifying the posited relations of the observed variables to the underlying construct that intercorrelated freely and was also tested.

Structural equation modeling was further used to determine the predictive power of maternal attitude, subjective norm, perceived behavioral control, and intention on breastfeeding behavior. Maternal attitude represented mothers' feelings and perception (behavioral beliefs) toward breastfeeding behavior, which required respondents to indicate the likelihood of the outcome evaluated on a continuum scale ranging from 1 (extremely unlikely) to 7 (extremely likely). The corresponding strength of behavioral belief on the outcome evaluated was also indicated along a continuum scale, 1 (extremely undesirable) to 7 (extremely desirable). The likelihood of each outcome evaluation and the corresponding strength of behavioral belief was multiplied and summed up to obtain the measure of maternal attitude. Subjective norm was measured as the mother's perception of the emotional, instructional, and informational support that she receives from significant others to practice breastfeeding behavior. Significant people to the breastfeeding mother identified included mother's partner, family members, and members of medical profession/traditional birth attendant. The assessment of subjective norm required respondents to indicate the influence of significant referents (normative belief) of practicing the breastfeeding behavior along a continuum scale ranging from 1 (extremely unlikely) to 7 (extremely likely). The strength of each normative belief was multiplied by the corresponding motivation to comply indicated along continuum scale ranging from 1 (extremely undesirable) to 7 (extremely desirable). The product of all the items was summed to obtain the measure of subjective norm. Perceived behavioral control was defined as the presence or absence of requisite resources and opportunities that influenced respondents' perception of the ease or difficulty in performing the breastfeeding behavior. This was measured both directly and indirectly. The direct measure was obtained from respondent's confidence in her ability to practice breastfeeding behavior. Respondents were required to indicate the extent to which each of the factors would facilitate/inhibit (control belief) breastfeeding behavior along a continuum scale ranging from 1 (most unlikely) to 7 (most likely). These beliefs were summed up to obtain the direct measure of perceived behavioral control. For the indirect measure, the strength of each control belief was multiplied by the corresponding power of the factor in the respondent's ability to practice the breastfeeding behavior. Respondents were required to indicate the extent to which each of the factors would facilitate/inhibit (control belief) breastfeeding behavior along a continuum scale ranging from 1 (extremely unlikely) to 7 (extremely likely). The strength of each control belief was multiplied by the corresponding power of the factor in the respondent's ability to practice breastfeeding behavior that was located on a continuum scale of 1 (extremely undesirable) to 7 (extremely desirable). The product was summed up to obtain the indirect measure of perceived behavioral control. Breastfeeding intention was assessed by the extent to which the respondents

Table 1.

Reliability Test for Breastfeeding Behavior Questionnaire

Concepts Measurement	Number of Items	Cronbach's α (Pretest, N = 23)	Cronbach's (Main Survey, N = 230)
Measures			
Behavior-1	3	.65	.81
Behavior-2	3	.68	.85
Behavior-3	3	.66	.92
Salient belief measures			
Attitude-1	6	.60	.74
Attitude-2	6	.63	.72
Attitude-3	6	.61	.73
Normative belief measures			
Subjective Norm-1	6	.62	.82
Subjective Norm-2	6	.64	.83
Subjective Norm-3	6	.63	.84
Control belief measures			
Perceived Behavioral Control-1	6	.63	.72
Perceived Behavioral Control-2	6	.61	.73
Perceived Behavioral Control-3	6	.64	.70
Breastfeeding intention			
Intention-1	3	.53	.79
Intention-2	3	.54	.76
Intention-3	3	.52	.77

Abbreviations: 1, Initiation of breastfeeding within first hour of birth; 2, Exclusive breastfeeding for the first 6 months of life; 3, Continued breastfeeding through the first year after birth.

were willing to practice breastfeeding behavior (initiate breastfeeding within the first hour of birth, exclusively breastfeed for 6 months, and continue breastfeeding through the first year). Measurements of this was done using a Likert-type scale ranging from 1 to 7, where 1 represented not at all and 7 represented very much. The overall model fit was evaluated using χ^2 (CMIN) and relative χ^2 divided by degrees of freedom (CMIN/df), comparative fit index (CFI), the standardized root mean square error of approximation (RMSEA), Hoelter's critical N, and Bollestine bootstrap. CFI and Tucker–Lewis index (TLI) values greater than .90 were considered satisfactory.[33] RMSEA values less than .08 were considered

Table 2.

The Validity of Measures of Breastfeeding Behavior

Scales (N = 230)	Components (Factors) 1	2
Maternal Attitude		
Attitude-1	.84	.11
Attitude-2	.78	.98
Attitude-3	.88	.04
Average communality	.84	.38
Percentage variance explained	75.15%	22.14%
Subjective Norm		
Subjective norm-1	.95	
Subjective norm-2	.85	
Subjective norm-3	.53	
Average communality	.82	
Percentage variance explained	70.79%	
Perceived Behavioral Control		
Perceived behavioral control-1	.79	
Perceived behavioral control-2	.81	
Perceived behavioral control-3	.74	
Average communality	.78	
Percentage variance explained	61.42%	
Breastfeeding Intention		
Intention-1	.78	
Intention-2	.69	
Intention-3	.81	
Average communality	.76	
Percentage variance explained	68.04%	

Abbreviations: 1, Initiation of breastfeeding within first hour of birth; 2, Exclusive breastfeeding for first 6 months of life; 3, continued breastfeeding through the first year after birth.

satisfactory.[34] CMIN/df was regarded as fit when it ranged between 3:1 and considered more better when closer but not less than 1.[35] Hoelter's critical N for significance levels of .05 and .01 were used where bootstrap samples were set at 200.[36]

Results

Reliability and Validity of Breastfeeding Behavior Questionnaire

Factor analysis was used to determine dimensionality of scales of the questionnaire. During pretesting, attitude, subjective norm, and perceived behavioral control measures obtained questionable reliability. Measures of intention presented poor reliability. After data collection, measures of maternal attitude presented an acceptable reliability. All the measures of subjective norm presented a good reliability, perceived behavioral control measures presented an acceptable reliability, and intention measures presented good reliability. So the questionnaire used for this study was considered reliable (see Table 1).

The measures of attitude, subjective norm, and perceived behavioral control were also subjected to a dimensionality test performed using factor analysis. Table 2 shows factor loading for each variable on the rotated components. The initial variable subjected to principal component analysis focused on attitude. The 3 attitude variables were loaded into 1 linear component that accounted for 75.15% of the total variance. This factor was labeled "Maternal attitude toward breastfeeding behavior." The average of the 3 maternal attitude communalities was .84, which was considered good for the measurement. Second, 3 measures of subjective norm were loaded into a linear component accounting for 70.79% of the total variance. This factor was labeled "Measure of subjective norm toward breastfeeding behavior." The average of the 12 subjective norm communalities was .82, which was good for the measurement. Third, 3 variables measuring perceived behavioral control were loaded into a linear component accounting for 74.72% of the total variance. This factor was labeled "Perceived behavioral control toward breastfeeding behavior." The average of the 12 attitude communalities was .78, which was considered good for the measurement. Finally, 3 variables measuring breastfeeding intention were loaded into a linear component accounting for 68.04% of the total variance. This factor was labeled "Breastfeeding intention toward breastfeeding behavior." The average of the 12 intention communalities was .76, which was considered good for the measurement.

Table 3.

Assessment of Multivariate Normality of the Measurement Model

Variable	Minimum	Maximum	Skewness	Critical Ratio	Kurtosis	Critical Ratio
B3	1.00	7.00	2.42	2.60	2.93	3.19
B2	1.00	7.00	2.00	2.21	2.78	2.88
B1	1.00	7.00	2.62	2.20	2.18	2.77
PC1	2.00	6.00	2.41	2.53	3.48	2.50
PC2	4.00	7.00	2.45	2.71	2.98	3.05
PC3	3.00	6.00	2.55	3.45	3.99	2.08
SN1	2.00	4.00	2.58	2.59	2.96	3.00
SN2	3.00	8.00	2.82	2.10	3.04	3.24
SN3	2.00	9.00	2.96	2.98	3.52	2.61
I1	2.00	7.00	2.80	3.48	2.54	3.79
I2	1.00	7.00	2.40	2.50	2.79	3.45
I3	1.00	7.00	2.89	3.54	2.52	3.62
A1	2.00	8.00	2.59	3.21	2.66	3.19
A2	3.00	6.00	2.85	2.55	2.87	2.77
A3	2.00	5.00	2.65	2.56	2.90	2.32
Multivariate					44.28	39.18

Abbreviations: 1, Initiation of breastfeeding within first hour of birth; 2, Exclusive breastfeeding for 6 months of life; 3, continued breastfeeding through the first year after birth; B, breastfeeding behavior; PC, perceived behavioral control; SN, subjective norm; A, attitude; I, intention.

Assessment of Multivariate Normality of the Measurement Model

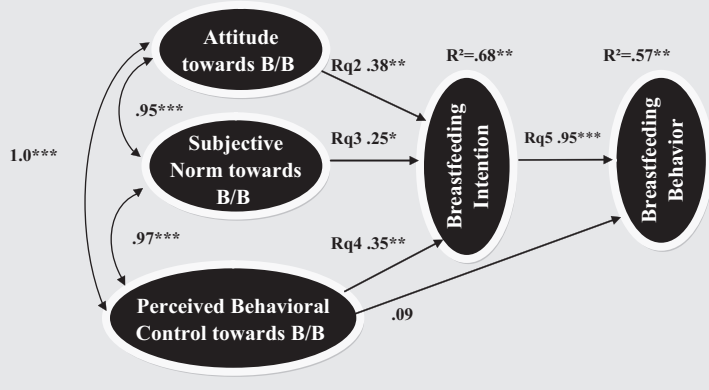
First it was important to submit the cases to a normality test of multivariate examination before fitting the model to examine data and check if the necessary distributional assumptions are reasonable (see Table 3). All the measures were subjected to skewness test based on the recommended range of ±2 for normal distribution.[37] The critical ratio represents skewness (or kurtosis) divided by the standard error of skewness (or kurtosis). It is interpreted as one would interpret a *z*-score. Values greater than 2, 2.5, or 3 are often used to indicate statistically significant skew or kurtosis. In this study, items presented positive skew and all measures of breastfeeding behavior were normally distributed.

Predictability of Maternal Attitude, Subjective Norm, Perceived Behavioral Control, and Intention

It was found that the items characterizing attitude, subjective norm, perceived behavioral control, and intention had high regression weights approaching to 1.00. The relationships between observed variables in the model (see Figure 2) were significant. The goodness of fit was statistically nonsignificant at the .01 level, but the model would be rejected at the .05 level (χ^2 = 620.1, df = 250, P = .12, χ^2/df = 2.30). Although the χ^2 was under the recommended 3:1 range indicating acceptable fit, after significant modification indices were unassociated. Other fit indices (TLI = .93, CFI = .95, RMSEA = .090) also showed a good model fit (see Table 4). Hoelter's critical N values recommend that the model would have been accepted for lower limit at the .05 significance level with 200 cases, and the upper limit of N for the .01 significance level is 230 cases. The Bollen–Stine P = .12 provided further reassurance about the model fit among other global fit indices. The regression weights indicate that maternal attitude had a statistically stronger significant influence on breastfeeding behavior through breastfeeding intention (β = .38, P < .01, N = 230). Indirect perceived behavioral control had a statistically strong significant influence on breastfeeding behavior through breastfeeding intention (β = .35, P < .01, N = 230). This was followed with subjective norm, which had a statistically significant influence on breastfeeding behavior through breastfeeding intention (β = .25, P < .05, N = 230). Breastfeeding intention was found to have the strongest prediction for breastfeeding behavior (β = .95,

Figure 2.

Default Model.



Abbreviations: Rq, research question; B/B, breastfeeding behavior.
***P < .001. **P < .01. *P < .05.

P < .001, N = 230). Direct perceived behavioral control had the least influence on breastfeeding behavior (β = .09, N = 230; see Figure 2).

Discussion

Goodness of Fit of a Nested Model

The overall modeling analysis exhibited 3 types of outputs, namely, saturated, default, and independent model (Table 4). The default model (Figure 2) is the researcher's model, always more parsimonious than the saturated model and almost always fitting better than the independence model with which it is compared using goodness of fit measures. That is, the default model (Figure 2) has a goodness of fit between the perfect explanation of the trivial saturated model and terrible explanatory power of the independence model, which assumes no relationships. The default model was acceptable by providing a good fit to the data (RMSEA = .090, CFI = .95, CMIN/df = 2.21, TLI = .93) and Hoelter's critical N = 230. The default model explained 68% of variance for breastfeeding intention and 57% of variance for breastfeeding behavior.

Predictive Power of Maternal Attitude

The default model had significant predictive power and was valued, since the forecasts supported the validity of the TPB model. The concept of predictive power involves breastfeeding behavior that was retrospectively explained by TPB, which allowed a prospective test of theoretical understanding. The predictive power of maternal attitude, subjective norm perceived behavioral control, and breastfeeding intention in extrapolating breastfeeding behavior was tested. Standardized regression weights in Figure 2 indicates that maternal attitude was a better predictor of breastfeeding intention (β = .38, P < .01, N = 230). Maternal attitude was significantly associated with mothers' evaluation of the advantages and disadvantages of practicing optimal breastfeeding behavior. These findings are in support with past studies that reported maternal attitude to be a significant predictor of breastfeeding intention.[1,14,28] More recently Al-Akour et al[7] reported positive maternal attitude to be associated with supportive husbands who motivated their wives to practice optimal breastfeeding. In this study, maternal attitude was perceived to be associated with maternal breastfeeding knowledge, influence of health professionals/traditional birth attendants, family members, husbands, and self-efficacy to practice the behavior. This illustrates that attitude correlates with other factors for it to be optimal. The current study established a statistically significant correlation between maternal attitude and subjective norm (r = .95, P = .001). The correlation between attitude and perceived behavioral control was stronger, positive, and statistically significant (r = .97, P = .001). Contrarily, mothers may have positive attitudes toward breastfeeding behavior although the obstacles they encounter surpass their ability to optimally practice the behavior.[8,38] Wojcicki et al[39] emphasized that current approaches of promoting breastfeeding behavior will continue to be inefficient unless the maternal attitudes are addressed by health professional and society at large.

Predictive Power of Subjective Norm

A mother's decision to optimal breastfeed is influenced by what is socially acceptable, open to social and cultural influences. We examined normative influences in relation to referents differing in social distance, including husband, health professional/traditional birth attendant, and family members. However, of particular interest in this study was the detailed analysis of mother's perception of social pressure from significant sources of reference and change in perception of these views in relation to initiation, exclusivity, and continued breastfeeding. The perception of mother's partner, family members, and health professionals/traditional birth attendants in terms of optimal breastfeeding was significant as in other studies.[16,40] Although previous studies have noted the importance of the mother's partner, her own mother's views would merit more detailed study, particularly in relation to different sociocultural contexts. It is of particular interest to note respondents for this study rated the views of health professionals/traditional birth attendants as most significant in influencing breastfeeding intention. This has a significant implication on practicing breastfeeding

Table 4.

Model Outputs

Fit	Saturated Model	Independent Model	Default Model
RMSEA (.09 or less is better)	.0	1.0	.09
CFI (above .9 is good fit)	.56	.45	.95
CMIN/df (between 2 and 3)	3.44	2.33	2.21
TLI (>.5 is good fit)	4.3	1.2	0.93
Hoelter's critical N (>200 adequate)	230	230	230
P > .10 good fit	.04	.65	.12

Abbreviations: RMSEA, root mean square error of approximation; CFI, comparative fit index; CMIN/df, χ^2/degree of freedom; TLI, Tucker–Lewis index.

behavior. Maintaining both formal support from health professionals and informal support for breastfeeding mother is crucial in promoting optimal breastfeeding. More informally structured relationships between health professionals/traditional birth attendants and the breastfeeding mother encourages them to assign more importance on optimal breastfeeding. Family members should also be involved in educational programs to promote optimal breastfeeding by encouraging and supporting a breastfeeding mother. Since attitudes formed early, structured and informative breastfeeding education could be appropriate to those people close to the breastfeeding mother.

Predictive Power of Perceived Behavioral Control

A strong statistically significant influence of indirect perceived behavioral control (β = .35, $P < .01$, N = 230) and a statistically least significant direct perceived behavioral control (β = .09, $P < .01$, N = 230) were reported. Ajzen[30] contended that the direct link may only be apparent when perceived control closely parallels actual control. We conjecture that perceived control did not parallel actual control in this group of mothers, for whom the sense of breastfeeding control only exerted its effect more indirectly through breastfeeding intentions. The indirect measure is promising because it shows that though mothers have other obstacles to breastfeeding behavior, they have confidence in their ability to practice this behavior. Previous research reported positive relationship between indirect perceived behavioral control and breastfeeding intention.[41,42] It was hypothesized that perceived behavioral control would influence breastfeeding behavior as it would be similar to self-efficacy, since both are concerned with perceived ability to perform a behavior.[43] When a mother has higher sense of self-efficacy regarding optimal breastfeeding, she will react more positively when problems arise and persist when confronted with problems.[44] Therefore, a higher perceived behavioral control score in the indirect measure should be associated with lower problem severity perceptions in practice of optimal breastfeeding. Increasingly, younger Kenyan mothers have access to more education opportunities, consequentially higher possibilities for work outside the home, resulting to limited time to optimally breastfeed.[23] In an analysis of the mean duration of breastfeeding in Africa, it was noted that women with 7 or more years of education reported shorter duration of breastfeeding than those with none.[45] Like other African women, Kenyan women are increasingly joining the labor force and experiencing changing gender relations, resulting in inadequate focus to practice optimal breastfeeding.[46]

Based on the study analysis, maternal attitude, subjective norm, and indirect perceived behavioral control had a statistically significant influence on respondents' breastfeeding intention. However, the direct influence of perceived behavioral control on breastfeeding behavior illustrated a very minimal prediction (β = .02, $P > .01$, N = 230). As the analytical results of Taylor and Todd[47] showed that although direct perceived behavioral control is reasonably explained by belief control, it does not in turn provide better prediction of intention over and above that provided by indirect subjective norm, attitude, and perceived behavioral control. Furthermore, Ajzen and Madden[48] also claimed that the direct perceived behavioral control is less likely to be related to intention.

Predictive Power of Intention

Given that the predictive power of maternal attitude, subjective norm, and perceived behavioral control statistically influenced breastfeeding intention (β = .95, $P < .001$, N = 230), this study establishes these psychosocial factors to virtually influence breastfeeding behavior. This indicates that a unit change in maternal attitude, subjective norm, and perceived behavioral control was associated with a change of 0.38, 0.25, 0.35 units, respectively, in breastfeeding intention. A variance of 68% was obtained for breastfeeding intention

predictors, whereas direct perceived behavioral control and breastfeeding intention accounted for 57% of variance on breastfeeding behavior. Thus, the aspect of predictability of psychosocial factors is not just a mere postulation but a logically proven detail.

Implications for Practice and Research

Our data reveal that predictive power of psychosocial factors remains statistically significant in influencing breastfeeding behavior among breastfeeding mothers. This means that further efforts to increase breastfeeding behavior promotions by practitioners, researchers, and government is needed. Since mothers desire to initiate breastfeeding within the first hour of birth, exclusively for 6 months, and continue breastfeeding through the first year and beyond, but they encounter barriers that originate from maternal attitude, social pressures from significant referents, and their self-efficacy (confidence). These attitudinal, normative, and control beliefs, which the study has determined to be predictive, are breastfeeding barriers that limit mother's capability of practicing breastfeeding behavior. Hence, efforts should include further promotion and research into mother's perception of the value of breastfeeding behavior that affects her maternal attitude. Practitioners should address the issue of social support from people who are significant to the breastfeeding mother and influence her breastfeeding intention. Discussing the mother's worries, providing education on the anxiety response, and offering help with structured problem solving and relaxation techniques may help alleviate the mother's breastfeeding self-efficacy, thus boosting her emotional support. Health professionals may be able to support a mother practice breastfeeding behavior by designing interventions that promotes the mother's desire for initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for 6 months, and continued breastfeeding through the first year and beyond. These are achievable by emphasizing the value of breastfeeding and involving significant social referents in the woman's breastfeeding education and her decision-making process. To enhance mothers' self-efficacy, they need to be informed of the challenges that may arise during their practice of breastfeeding behavior and how to overcome them. Therefore, this research confirms that psychosocial factors, namely, attitude, subjective norm, perceived behavioral control, and intention, are important predictors of optimal breastfeeding and may also limit the practice of breastfeeding behavior among mothers in a developing country. This information has important implication for health practitioners and future research, which represents a need to increase our ability to identify women or mothers at risk of suboptimal breastfeeding behavior and to construct programs capable of using the developed framework from this study to enhance breastfeeding behavior among women and mothers.

Conclusion

Breastfeeding promoters, practitioners, and researchers should capitalize on understanding and motivating mothers about these psychosocial factors that determine mothers' breastfeeding intention by using the generated modified framework from Ajzen's TPB. Since our findings support the use of the TPB to predict the influence of maternal attitude, subjective norm/social pressures, and perceived behavioral control on breastfeeding intention, it is significant for breastfeeding promotion programs to incorporate strategies that target mothers' beliefs on breastfeeding behavior, which in turn reveals what beliefs and factors that need to be addressed for breastfeeding behavior to practiced. Given that breastfeeding promotions are conducted without understanding the fundamental cause of suboptimal breastfeeding behavior among mothers, the TPB provided useful information to help understand mothers' decisions to practice breastfeeding behavior. Hence, the current factual-based approach of conveying breastfeeding instructions that lacks the motivational power to determine a mother's psychosocial aspects, which establishes her breastfeeding intention, should be improved by adopting this study's framework that provides a better approach of understanding factors that influence breastfeeding behavior. Although breastfeeding behavior of respondents in the 4 postnatal clinics significantly varied they were only reported and controlled during analysis but not established. The analysis of breastfeeding behavior in each of the 4 postnatal clinics could have been conducted by comparing model fitness indices; however, sample size did not allow for smaller clustering of respondents. The efficacy of TPB has been illustrated by the model fit and, thus, we comprehended breastfeeding behavior among breastfeeding mothers at postnatal clinics. This study recommends that educating mothers about the benefits of breastfeeding behavior, identifying barriers to breastfeeding, developing strategies to address the barriers, and eliciting social influence from mothers' significant referents may be important areas to target for future breastfeeding promotion programs.

Appendix

Variable Names and Their Definitions

Attitude: The certainty about likely outcomes of practicing breastfeeding behavior multiplied with the corresponding evaluation of each of these outcomes (behavioral beliefs).

Behavior: This study defines behavior as early initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for 6 months of life, and continued breastfeeding through the first year.

Breastfeeding: Nourishing an infant on its mother's breast milk from the breast or expressed breast-milk from the cup.

Breastfeeding Behavior: This is the initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for 6 months of life, and continued breastfeeding through the first year. A mother has to practice all this for breastfeeding behavior to be optimal.

Behavioral Beliefs: The beliefs a breastfeeding mother has about the likely outcomes of breastfeeding behavior and the evaluations of these outcomes.

Control Beliefs: Beliefs about factors that impede or facilitate practice of breastfeeding behavior and the perceived power of the factors.

Exclusive Breastfeeding: Feeding an infant on breast-milk for the first 6 months without supplementation with infant formula milk or complementary foods.

Health Professionals: These are trained and certified nurses, midwives, and clinical officers providing breastfeeding education and support to a breastfeeding mother attending a postnatal clinic in a health center.

Home-Based Clinics: These are treatment centers (registered by Ministry of Public Health and Sanitation) found in the countryside in people's homes, managed by traditional birth attendants, and provide both prenatal and postnatal services to mothers.

Intention: The motivation of a breastfeeding mother in the sense of her conscious plan to exert efforts to carry out the breastfeeding behavior.

Motivation to Comply: The extent to which a breastfeeding mother feels inclined to match her breastfeeding behavior to various sources of social pressure.

Norm: A standard behavior (breastfeeding) that is typical or accepted within a particular group or society.

Normative Beliefs: The influences of significant referents (mother's partner, nurse/traditional birth attendant, family members) on whether a breastfeeding mother should optimally/suboptimally breastfeed.

Perceived Behavioral Control: Certainty about the presence of factors that facilitates or impedes performance of optimal breastfeeding behavior multiplied with the perceived power of the factors (control beliefs) over breastfeeding mother's self efficacy.

Psychosocial Factors: These are breastfeeding mothers' cognitive and experiential aspects that explain how she makes the decision or arrives at intention to optimally breastfeed, including attitude, subjective norm, and perceived behavioral control.

Significant Referents: These are people who are close to the breastfeeding mother and influence mother's breastfeeding intention to optimally or suboptimally breastfeed.

Subjective Norm: Certainty about the normative expectations of significant referents multiplied with breastfeeding mother's motivation of compliance with these expectations (normative beliefs).

Suboptimal Breastfeeding Behavior: The practice of initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for 6 months, and continued breastfeeding through the first year and beyond.

Traditional Birth Attendants: These are trained elderly women who offer informal maternal and child health services to mothers during prenatal and postnatal periods. These services are offered from the traditional birth attendant's home using informal skills and herbs that are given to the breastfeeding mother.

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