Physical Activity Based on the BASNEF Model Constructs in Women with a Child Less Than Two Years of Age

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Abstract

Background: Lack of physical activity plays an important role in increasing blood pressure, diabetes, elevated lipids, and obesity. Postpartum women are at risk for low physical activity.

Objectives: The aim of this study was to determine the status of physical activity based on beliefs, attitudes, subjective norms, and enabling factors (BASNEF) model constructs at the postpartum period in women attending the centers of comprehensive health services.

Methods: This cross-sectional study was performed on 217 randomly selected mothers who had a child less than 2 years of age in Sanandaj, Kurdistan Province, northwest of Iran. A researcher-made questionnaire including demographic information and BASNEF model components was used to collect the data. Data were analyzed in SPSS software version 22 and using Pearson's correlation coefficient, multiple linear regression, and logistic regression.

Results: Results showed that 89% of mothers had low or no physical activity. According to the findings, despite the fact that all three components of knowledge, attitude, and subjective norms somewhat predicted the intention to engage in physical activity, the predictive ability of the subjective norms with a correlation coefficient of 0.34 was statistically significant (P < 0.001) in predicting the mother's physical activity.

Conclusions: The results of this study showed that the level of physical activity of studied women after childbirth was undesirable. Designing and implementing interventions by health managers and providers to change women's behavior and encouraging them to do physical activity is necessary.

Keywords: BASNEF Model, Physical Activity, Postpartum Period, Mothers

1. Background

Urbanization and industrialization of communities are associated with many changes in lifestyle (1). Adequate physical activity is one of the aspects of a healthy lifestyle that has a lot of positive effects on people's physical and mental health (2). Physical activity and proper exercise are one of the cheapest ways to maintain health and prevent non-communicable diseases (3). Inadequate physical activity increases the likelihood of diabetes, hypertension, obesity, hyperlipidemia, cancer, and chronic respiratory diseases (4, 5). Despite the many benefits of physical activity, studies in Iran have shown that more than 70% of people do not exercise enough (6). Women are more at risk of inactivity compared to men; in addition, some of the special stages of women's lives, such as pregnancy and breastfeeding, typically make them more vulnerable to a reduc-

tion in physical activity than men. It makes them more likely to develop diseases and suffer from a disability (7, 8). Women, who experience pregnancy and those with children, as compared with those not experiencing delivery and those without a child, have less physical activity. During this period of life, mothers are at a high risk of sedentary life and, as a result, are susceptible to obesity and diabetes (2, 9).

Studies have also shown that exercise can prevent postpartum depression (10) and enhance the confidence and quality of life of mothers after childbirth (11). Physical activity after childbirth can maintain cardiovascular activity, reduce depression and anxiety, lead to mood improvement, decrease weight, and maintain lactation during the postpartum period; it can also control common postpartum physical and mental disorders (11, 12). In general, children with parents, especially mothers who have proper

and enough physical activity, are more likely to become physically active, and this habit of regular physical activity from childhood to adulthood can have very beneficial effects on these children (13). On the other hand, physical activity can lead to a reduction in depression in mothers (14).

Obviously, one of the basic strategies for promoting physical activity in the community is health education (10). Accordingly, it can be said that increasing mothers' awareness of physical activity and physical exercise and changing their attitudes can change their behavior (15). To this end, the utilization of behavioral models and theories can be a good guide and tool for adopting interventions to increase physical activity (5). The BASNEF model is one of the models that are used to plan and modify the factors that contribute to people's decision making about effective behavior (Figure 1) (16). Based on Fishbein's approach, the behavior is formed by the constructs of attitude, behavioral intention, and abstract norms, along with the enabling factors, which distinguish this model from other models (17). As one of the features of the BASNEF model, when planning a change or stabilization in behavior, this model considers one's beliefs and attitudes toward the results of the evaluation of the adoption and practice of a behavior. In fact, normative beliefs and pressures that lead to a decision about the method of changing and maintaining the desired behavior are addressed along with enabling factors. Enabling factors include factors that cause to intend a particular behavior and somehow reinforce an intention to behave (5). Studies have shown that one of the most important determinants of physical activity is the barriers that one experiences when practicing a behavior (6). Physical activity is directly associated with access to a suitable place and equipment for exercise, a vehicle to commute to the site of exercise, and an exercise program (17).
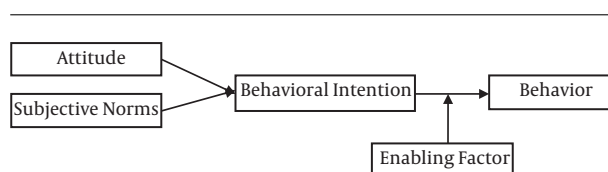

Figure 1. BASNEF model overview (18)

Based on the aforementioned items, awareness of the level of physical activity of women after delivery and understanding its associated factors can help plan educational and operational interventions to encourage this population group to engage in physical activity and administer timely interventions to modify and correct inappropriate physical activity.

2. Objectives

Given the importance of physical activity and the capacity of the BASNEF model to identify factors related to its promotion, the present study investigated the status of physical activity and its related factors in postpartum women using this model.

3. Methods

This was a cross-sectional (descriptive-analytical) study on 217 women who were referred to comprehensive health service centers in Sanandaj, Kurdistan Province in the northwest of Iran, in 2018. In this study, the subjects were selected using the random sampling method from the list of mothers who registered in the health system database. The city of Sanandaj has 16 comprehensive health service centers; one or two health stations were selected from each center, and a total of 21 health stations were randomly selected as the research setting. After coordinating with the health deputy of the university and the head of the district health center, as well as the officials working in the comprehensive health service centers, a total of 20 mothers with children under two years of age were randomly selected from each station. Sampling and surveying were carried out in two months, from June to August 2018. Due to the problems in completing the data, three subjects were excluded, and a total of 217 questionnaires were completed and analyzed.

Based on inclusion criteria, mothers aged 15 to 45 years, with children under 2 years of age, without any acute or chronic physical and mental illnesses, with healthy neonates, and with health records that referred to comprehensive health service centers were enrolled in the study. Before completing the questionnaire, the subjects were briefed about the aim of the study, and oral consent was obtained from each of them; they were also allowed to quit the study whenever they wished.

In this study, the data gathering tool was a researcher-made questionnaire that was based on the BASNEF model and was developed based on valid and authentic references in this field. The researcher-made questionnaire consisted of three sections formed using a similar questionnaire (10) and was designed consistent with the subject of the study.

The validity of the items in the questionnaire was evaluated using the opinions of 10 experts in different fields, including health education, epidemiology, and social medicine. The estimated content validity index (CVI) and content validity ratio (CVR) were in line with the standard values, and they were measured in the final form of items in each section. The CVR for the items of the questionnaire was 82%.

The questionnaire included demographic items and model constructs, all of which were self-reported. Taking into consideration the constructs of the BASNEF model, the tool consisted of several parts: The first part collected data on demographic features of the population under the study, including the variables of age, level of education, employment status, infant age, family income, number of pregnancies, type of delivery, and body mass index (a total of 10 items). The second part consisted of specific questions about awareness of the benefits of doing physical activity. In this part, each item had the three choices of correct, false, and unknown which were scored on a three-point scale (correct was scored 1, and false and unknown were scored zero). The third part of the questionnaire included the constructs of the BASNEF model, which consisted of 8 items about the attitude toward physical activity, 4 items about physical activity behavioral intention, and 6 items about abstract norms regarding physical activity. This part was measured using a five-point Likert scale, ranging from very low to very high, and scored from 1 to 5. There were also 7 items about factors enabling physical activity, which were also measured using a five-point Likert scale, ranging from strongly disagree to strongly agree, and scored from 1 to 5.

Physical activity behavior was also assessed using the short form of the standard 7-day International Physical Activity questionnaire, whose validity and reliability have been reported in various studies (19, 20). The collected data were analyzed using SPSS software version 22. Descriptive statistics, including mean, standard deviation, frequency, and relative frequency, were used to describe the data. Data were also analyzed using the Pearson correlation coefficient, multiple linear regression, and logistic regression.

4. Results

A total of 217 women were enrolled in this study. The mean age of the participants was 31.11 ± 5.2 years, ranging from 19 to 45 years. Table 1 presents a summary of other demographic characteristics of the participants.

As indicated in Table 2, 89% of the studied mothers in the postpartum period had low physical activity; in other words, they had a sedentary lifestyle. Nine percent of them had moderate physical activity and only 3% had high physical activity.

Table 2 presents the mean, standard deviation, range of obtainable score, and Pearson's correlation coefficient for the constructs of the BASNEF model. Based on the results presented in Table 2, the correlation between all the model constructs was significant, although the correlation between the enabling factors construct and the other constructs was negative.

Table 1. Demographic Information and Physical Activity Status of the Study Participants

Variable	No. (%)
Education	
First high school	82 (37.8)
High school	77 (35.5)
College education	58 (26.7)
Gravidity	
First pregnancy	106 (48.8)
Second pregnancy	73 (33.6)
Third pregnancy and more	38 (17.5)
Employment	
Housewife	195 (89.9)
Employed	22 (10.1)
Type of delivery	
Normal	137 (63.1)
Cesarean section	80 (36.9)
Type of pregnancy	
Wanted	182 (83.9)
Unwanted	35 (16.1)
Wife's job	
Employee	70 (32.3)
Self-employed	129 (59.4)
Retired	14 (6.5)
Unemployed	4 (1.8)
Husband education	
First high school	54 (24.9)
High school graduate	83 (38.2)
College education	80 (36.9)
Physical activity	
Low	192 89.0 ()
Moderate	19 (9.0)
High	6 (3.0)

A multiple linear regression model was used to predict the intention to do a physical activity based on the scores of the other three constructs, namely awareness, attitude, and abstract norms. The results are summarized in Table 3. As presented in Table 3, although all the three constructs were somewhat predictive of behavioral intention to perform physical activity, the predictive power of the abstract norms construct with a coefficient of 0.34 was statistically significant (P < 0.001).

The logistic regression model was used to investigate the relationship between the physical activity behavior of

Table 2. Mean, SD, Acquired Score Range, and Pearson Correlation Coefficient Between BASNEF Model Structures

Variables (Constructs of BASNEF Model)[a]	1	2	3	4	5	Average ± SD	Limitable Score Acceptable
Knowledge	1					9.63 ± 2.42	0 - 16
Attitude	0.434	1				32.16 ± 3.26	8 - 40
Subjective norms	0.350	0.523	1			25.28 ± 5.44	6 - 30
Behavioral intention	0.178	0.322	0.4600	1		11.94 ± 5.11	4 - 20
Enabling factor	-0.316	-0.293	-0.238	-0.188	1	23.52 ± 5.25	7 - 35

[a]Correlation between all the constructs was significant at both 0.05 and 0.01 levels.

Table 3. Results of the Linear Regression of BASNEF Model Structures in Predicting Intention to Perform Postpartum Physical Activity in Women

Variable	Regression Coefficient	Standard Error	Significance	Explanation Coefficient, %
Attitude	0.199	0.063	0.07	23.2
Subjective Norms	0.343	0.069	< 0.001	
Knowledge	0.026	0.168	0.9	
Constant value	-2.080	4.072	0.4	

the studied women and each of the behavioral intention constructs and enabling factors in the BASNEF model. Table 4 presents the results of modeling, including odds ratios and their corresponding 95% confidence interval for the association between physical activity and each of the two constructs of the BASNEF model, behavioral intention, and enabling factors. According to the results, the values of odds ratios were not statistically significant for either of these variables (P > 0.05).

5. Discussion

The aim of this study was to investigate the factors predicting physical activity among women after childbirth using the BASNEF model. Based on the results, all the studied women who were referred to comprehensive health service centers in Sanandaj were aged between 19 and 45 years; this finding is in line with the results of a study by Ramazani et al. (3). Since this age group is the youngest and most active age group, they have a higher level of motivation to control weight and keep fit. Accordingly, it is important to promote the awareness, attitude, and behavior of this age group (3). Various studies on physical activity have shown that physical activity of mothers in the postpartum period is low and light (10).

In this study, 89% of women had low or light physical activity. According to Ouji et al.'s study (10), 83% of postpartum women had low physical activity. In another study by Ramazani et al. (3) it was shown that 42.8% of middle-aged women (30 - 59 years old) were not physically active. According to the study of Roozbahani et al. (2), only 9% of

mothers with 3 to 5-month-year-old children were in the active phase of physical activity, and no one was in the maintenance phase, with 91% of mothers remaining in the pre-active phase, i.e. they were at pre-thinking, thinking, and preparing phases; these findings are consistent with the results of the present study. Postpartum mothers in Iran generally have less physical activity than they did before pregnancy, which may be due to cultural reasons, lifestyle changes, technology development, lack of amenities, or lack of support from those around them. Moreover, trainings provided to mothers during pregnancy and the postpartum period is not sufficient and does not promote physical activity in mothers (3). In general, mothers' physical activity after delivery is lower than the usual level, but their awareness score is moderate, and this finding has been reported in other similar studies (3). Understanding the level of physical activity in mothers and recognizing effective factors can be helpful in planning and executing programs to encourage mothers to have more physical activity. It also promotes timely intervention to correct behaviors. In this study, although all three constructs of awareness, attitude, and abstract norms partially predicted behavioral intention to perform physical activity, the predictive power of the abstract norm construct with a coefficient of 0.34 was statistically significant. In Saber et al.'s study, the construct of abstract norms was reported as a predictor of students' intention to do physical activity (20). In this study, the constructs of awareness, attitude, and abstract norms were identified as the predictors of intention to perform physical activity by postpartum mothers and explained 23.2% of changes in behavioral intention. In line with this, the results of a study by Moeini et al. (17) showed that attitude

Table 4. Results of Logistic Regression of BASNEF Model Structures in Predicting Postpartum Physical Activity Behavior in Women

Variable	Regression Coefficient	Standard Error	OR	95% CI for OR		P-Value
				Lower Bound	Upper Bound	
Behavioral intention	0.111	0.09	1.12	0.92	1.36	0.3
Enabling factors	0.048	0.09	1.05	0.88	1.25	0.6
Constant	-5.671	-5.827	0.003	-	-	0.3

Abbreviations: CI, confidence interval; OR, odds ratio.

and abstract norms were the predictors of students' intention to perform regular physical activity.

In addition, the results of the study by Ouji et al. (10) showed that awareness, attitude, and abstract norms were the predictors of intention to perform physical activity. According to the results of the present study, among the variables of the BASNEF model, the construct of abstract norms was the most important factor affecting physical activity among mothers after childbirth, and the construct of enabling factors had no role in predicting behavior. However, the studies conducted using the behavioral intention model have shown that behavioral intention is influenced by attitudes, abstract norms, and perceived behavioral control (17). Many women find it difficult to exercise due to their tasks at home and at work, and there is a need to investigate the barriers to exercise in postpartum women, including lack of time and family support. Like any other study, this study also had some limitations. First of all, the data collected from the questionnaires were self-reported. Perhaps, the use of more objective tools, such as observing daily behavior, may provide a more accurate picture of daily activities. In addition, given that the study population only included postpartum women, because of the use of cross-sectional study design and a homogeneous population, it is not possible to generalize the results to all women in the community.

It should be noted that this study was carried out in 2018 when we were not exposed to the coronavirus (COVID-19) pandemic that is widespread throughout the world, as this pandemic can also affect the physical activity of all people, not only the mothers who had children under 5 years age (21). Considering this fact, health systems must have paid more attention to the physical activity of pregnant women and mothers who had children under two years of age.

5.1. Conclusions

Based on the results of this study, inactivity and low level of physical activity in postpartum women with children under two years of age among study participants are evident. Therefore, the following measures can be recommended to promote physical activity and its quality: (1) Promoting appropriate awareness in different population groups, especially postpartum mothers, regarding the benefits of exercise and physical activity in maintaining physical and mental health and preventing noncommunicable diseases; (2) changing lifestyle and choosing a physically active lifestyle; and (3) encouraging key people to support intervention programs.

Footnotes

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