A survey on the enablers and nurturers of physical activity in women with prediabetes

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ABSTRACT

Background and Objective: Metabolic syndrome, especially prediabetes, is one of the most common health problems due to incomplete glucose metabolism that has a direct relationship with lifestyle. This study was conducted to determine the factors that enable and nurture physical activity in women with prediabetes based on the PEN-3 model. Material and Method: This descriptive-analytical study was conducted on 41 prediabetic women aged 30-65 years and 9 service providers in health centers. Data were collected from a semi-structured individual interview based on the PEN-3 model. The Granheim and Lundman method was used to analyze the data. Results: During data analysis, two main themes that include enabling factors and nurturing factors in the domain of physical activity and 6 classes including enablers (positive, negative, and existential) and nurturers (positive, negative, and existential) were extracted from the data content. Conclusion: By determining enablers and nurturers, the providers of services can facilitate the participation of prediabetic women in physical activity by applying positive social and structural effects and also to eliminate negative environmental conditions.

Keywords: PEN-3 model, physical activity, prediabetes

Introduction

Before type 2 diabetes develops, there is a phase called prediabetes that results from incomplete glucose metabolism when the individual's blood glucose level is higher than normal.¹ This is characterized by an increase in fasting blood glucose (125–100 mg/dL) or an increase in blood glucose level 2 h after prescription of glucose (199 and 140 mg/dL). Moreover, if glycated hemoglobin (HbA1c) in adults is between 5.7–6.4%, the individual is recognized as prediabetic.² According to a WHO report, the prevalence of prediabetes has increased in recent years in a way that it is expected to reach 470 million individuals by 2030.³,⁴ A prediabetic person is at risk of problems such as cardiovascular diseases.⁵ The priority of a healthy lifestyle must be to follow regular physical activity. Despite recognized physical and mental benefits of physical activity, Iranians and people of other countries are mainly inactive.⁶ This inactivity results in the progress of the disease and the occurrence of irreversible complications. The individual’s lifestyle is impacted by surrounding people, especially family, society, and the healthcare providing team, in addition to

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This model was started with a qualitative study and it identifies the individual's beliefs and experiences regarding the problem in question. As a qualitative study for the identification of facilitators and inhibitors of physical activity, it can help the healthcare providers in the improvement of the adherence of women with prediabetes undertaking preventive behaviors. Therefore, the present study, using the cultural model PEN-3, has explored the identification of enablers and nurturers of physical activity in prediabetic women.

Materials and Methods

The ethical approval code is IR.SSUSPH.REC.1395.114 that was approved by Shahid Sadoughi University of Medical Sciences. This study aimed to extract the experiences of prediabetic women about physical activity with guided content analysis from February 2017 to November 2017 which was conducted with sampling among 41 prediabetic women aged 30–65 years and 9 service providers. Samples were selected from Dezful's Health Centers. In the present study, prediabetic women were subjected to an individual, in the depth-semi-structured interview based on the PEN-3 model. The interviews continued to reach the necessary richness in the sense of data saturation. The question of the interview was “what factors or conditions result in you doing or not doing physical activity?” Later, the appropriate exploratory questions such as “please explain more” were raised in relation to the research objectives. The interviews were conducted by the researcher. The subjects were selected with the highest variation (education, age, and ethnicity). The women at the referral center (urban and rural health center) were interviewed in a quiet place. The duration of each interview was 30 to 45 min. The data were analyzed using the Graneheim and Lundman method. After each interview session, the recorded data was typed and appropriate codes were given to the texts. Then any similar codes or those with similar meaning were placed in one group. It should be noted that, concerning the purpose of the interviews and the confidentiality of the stated data, the participants were given an adequate explanation for observing the ethics of the research. Their consent was obtained before the interviews. To achieve the validity and correctness of the research, the presented criteria by Graneheim and Lundman i.e. reliability and validity, conformability, and transferability were used. To fulfill data reliability, the exact speech of the participants was recorded in the form of a quotation in the qualitative results section.

Results

Demographic characteristics of prediabetic women have shown in Table 1.

The analysis of the quotes leads to the extraction of two main themes of “enablers” and “nurturers” that each of them includes three classes (positive, negative, and neutral).

Enablers-positive

Prediabetic women pointed out that their local medical centers and healthcare providers were informative and effective: “Since the expert of the center told me that I needed to exercise to reduce my blood glucose, I go to the gym and I am happy that I did not need medications” (participant 1).

The studied individuals pointed out that they perform group exercise programs such as family walking tours and exercise in sports halls as factors that enable them to participate in physical activities and said they preferred them: “I like participation in family walking tours and it is appropriate for me as I can be with my family” (p 3). The participants pointed out that the low costs of physical activity programs such as walking motivates them to do physical activity. Participant 10 expressed her experience in this regard as follows: “I walk that does not have any cost instead of going to the gym.” The possibility of walking to the shopping center (market) was considered to be a source of physical activity for women: “as I do not have time to exercise in the gym, I walk half an hour to the shopping center” (p 7).

Enablers-negative

Women with prediabetes felt a need for a nutritionist, exercise expert, and a psychologist in the center. “I prefer that there would

| Variable          | Option       | Number | Percentage |
|-------------------|--------------|--------|------------|
| Employment status | Housekeeper  | 26     | 63.4       |
|                   | Retired      | 5      | 12.1       |
|                   | Employed     | 10     | 24.3       |
| Marital status    | Single       | 2      | 4.8        |
|                   | Married      | 30     | 73.17      |
|                   | Divorced     | 3      | 7.3        |
|                   | Widow        | 6      | 14.6       |
| Education         | Illiterate   | 5      | 21.1       |
|                   | Elementary   | 11     | 26.8       |
|                   | Middle       | 13     | 31.7       |
|                   | High school  | 8      | 19.5       |
|                   | university   | 4      | 9.7        |
| Ethnicity         | Lur          | 12     | 29.26      |
|                   | Persian      | 16     | 39.02      |
|                   | Arab         | 13     | 31.7       |
be an exercise expert to give me a regular exercise program so that I can exercise based on the program” (p 8). The participants complained about the lack of file formation services and monthly follow-ups like in case of diabetic individuals: “It would be very good if a file was formed for the prediabetic patients and there was follow-up like for those with diabetes” (expert of the center). The women with prediabetes suggested that the healthcare providing team often presented oral and superficial information and presented different recommendations which lead to their confusion: “the doctor just said I should exercise but did not explain what kind of exercise I should do considering my arthritis problem” (p 11). Most women pointed out the lack of printed media in the center on familiarity with the disease and appropriate physical activities considering the condition of each individual: “the physician gave me some verbal suggestions and told me to walk. It would be better if she gave me a pamphlet for example regarding appropriate exercises that I can do in addition to walking” (p 13). Belief in the lack of security in a recreational environment in the city, especially for women, was another negative enabler: “public parks are not safe for us so that we could go alone and walk” (p 21). Most of the participants suggested that when the trainer has the same language as theirs, they feel more trust: “When the expert or physician that teaches me is of our people I can trust her more and I am more satisfied” (p 24).

Some participants pointed out that long-distance between their homes and the exercise environment, air pollution, and varying hot and cold weather conditions act as obstacles for their physical activity: “there is no gym or swimming pool near our house so that I can comfortably go” (p 17).

Enablers-existential

Women pointed out the reason for doing lack of physical activities such as walking is primarily due to society limitations including maintaining hijab and Islamic dress code outdoors: “We are not men; we have limitations; not that we do not exercise. It is better to go to the gym to exercise than to do walking outside” (p 28).

Nurturers-positive

According to the participants, one of the main issues that resulted in the starting and continuation of their adherence to doing physical activity was the support received from the healthcare team, family, friends, and neighbors. They also pointed out communicating with diabetic individuals and families: “my daughter continuously tells me to go to the gym with her as she goes herself. My daughter pays a lot of attention to me” (p 15).

Positive outcome experiences from doing physical activity were pointed out to result in the encouragement of participants to do physical activity. The positive experience of the participants pointed out by them were: reduction of high blood glucose, blood glucose control, blood lipid control, stress control, weight loss, increase of enjoyment, and happiness during physical activity: “It is one month since I observe both my diet and exercise. I am losing weight. I did some tests; my blood glucose is controlled. I like to continue going to the gym” (p 30).

Nurturers-negative

From the viewpoint of the participants, the lack of a women exercise culture in the family, family dogmas, and the lack of exercise culture within society followed by concern over negative attitudes of others prevent them from participation in physical activity: “my father always had dogmatic beliefs and would say that girls shall not be outside of house much. He was against us walking or even going to the gym. We grew up like this” (p 38).

Existential nurturers

The participants pointed out the family's objection with exercise in parks and green spaces that was not a barrier to doing physical activity and for compensating it and respecting the family's view they would go to the gym: “My husband does not allow me to walk but he allows me to go to the gym” (p 41).

Discussion

The findings indicated that despite the existence of positive environmental factors impacting women's physical activity, there are also negative inhibiting factors that prevent them from doing physical activity. The findings of this study indicated that easy access to their medical center and the healthcare team made women aware of having blood glucose at the borderline level. Thus, the existence of exercise consultants, mental-health counselors, and nutritionists for increasing knowledge and blood glucose control can be highly effective. However, the women and the healthcare team pointed out the ineffectiveness of medical systems in providing services, lack of enough skilled force for consultations, conflicting recommendations, and inadequate follow-ups for individuals with prediabetes as reasons for the lack of blood glucose control or their condition. Lewis and Mousavizadeh et al, rightly pointed out that the lack of receiving enough education and information and also low quality of care were barriers of adherence to the recommendation and treatment in developing countries. They also reported the lack of printed media in the medical center that should be paid attention to considering the importance of physical activity in the prevention of the disease advancement and affliction with type 2 diabetes in those with prediabetes. This finding is consistent with the results of the study by Sabzamakan. Women pointed out enjoying the participation in group physical activity as a motivator that should be paid attention to by organizational factors and policymakers in the domain of women exercise and health. These findings are consistent with the results of the studies by Nadri and Amini. Women viewed the lack of safety of the places of exercise in the city as a social obstacle for doing physical activity. This finding was consistent with the findings of Hossinzadeh and Mir-Gahafuri. Participants pointed out the hot and polluted weather and long distance between the exercise places, gyms, and home as barriers to physical activity. In this regard, the studies by Ilunga Tshiwaka, Casey, Motameni, and Pourranjar et al. are
verified the findings of the present study. Another reason for the low participation of women in physical activity was high costs of exercise classes which were consistent with the findings of the studies by Niknami,[24] Razm Ara,[28] and Holt.[24] Some of the participants pointed out the low cost of physical activities such as walking as a motivator for doing them. This is consistent with the findings from the study conducted by Perez et al.[27] Most women in the present study felt that they were comfortable in informal places in which their native language was spoken and they would look at the language culture difference with the healthcare team as an obstacle for education, such an issue was rarely pointed out in other studies and this finding was consistent with the finding of the studies conducted by Melancon[29] and Scarinci.[30] One of the cultural obstacles in this study was observation of Islamic dress code and maintaining hijab that would make it impossible for women to use exercise equipment in parks that are not roofed or some even felt walking in public places as unfavorable due to the presence of men and thus, some exercises were not seen appropriate for women. This result is consistent with the result of the study by Eversly.[30] In this study, the individuals impacting the doing or not doing of physical activity in prediabetic women were family members, physicians and the healthcare team, and friends and this result were similar to the results obtained by Arizi[11] which indicated the evident effect of social support on the rate of participation in physical activities. However, negative attitudes of the family members and lack of accompanying women in physical activity, especially by the husbands, due to an inactive family lifestyle or family dogmatic beliefs indicative of the lack of women’s exercise and sports culture in the family expressed as negative nurturers in the family for participation in exercise activities. These findings were consistent with the findings of the studies by Nadri,[16] Razmara,[17] and Shahbazi.[7] Communicating with diabetic families and individuals was also pointed out by women as a motivator for doing physical activity and this was also pointed out in the study by Shahbazi.[7] According to the findings of this study, women who experienced a favorable feeling, controlled stress and reduced blood glucose by exercising were more encouraged to do exercise. This finding was consistent with the findings of the studies by Amini[17] and Hosssinzadeh et al.[16] Finally, the limitation of this study, like similar qualitative studies, in terms of caution in generalizing the result should be paid attention to. As the medical center was a public center and the services were free of charge, most of those visiting the center was working or middle-class families and the social class diversification was not completely observed. As the study aimed to explore the experiences of women with prediabetes, comparison with the views of men with prediabetes was not possible.

Conclusion

The findings of this study can be helpful in obtaining the support of the health planners and care providers in paying more attention to social and structural factors at the levels of individual, family, and society in a sociocultural domain so that the most appropriate strategies for reducing the barriers are selected in educational intervention programs using health education models including PEN-3 model.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Bahmani A, Islamic fasting and its effect on pre-diabetic population. SJKU 2013;18:40-6.
2. Pakzad B, Abbasi-Veldani N, Akbari M. Determination of frequency of diabetes and pre-diabetes in patients with nonalcoholic fatty liver disease and comparison with a control group. JIMS 2016;33:2440-7.
3. Pittas AG, Lau J, Hu FB, Dawson-Hughes B. The role of vitamin D and calcium in type 2 diabetes. A systematic review and meta-analysis. J Clin Endocrinol Metab 2007;92:2017-29.
4. Ghassemi F, Ayremlou P, Zarrin R. Effect of vitamin D
supplementation on the blood pressure in prediabetic adults: A randomized clinical trial. J Urmia Univ Med Sci 2017;27:1003-11.
5. Shababi Z, Pouliadi S, Raeisi A, Motamed N, Farzaneh MR. On the study of herbal combination effect of securigeria securidaca, vaccinium arctostaphylos, citrullus colocynthis and coriandrum sativum on triglyceride of pre-diabetic elders. Iranian South Med J 2017;20:326-38.
6. Mazloomy Mahmoodabad SS, Sohrabi Vafa F, Vaezi AA, Karimi H, Fallahzadeh H. Explanation of the perceptions of women with prediabetes affecting physical activity: A qualitative study. Int J Ayurvedic Med 2019;10:95-104.
7. Shahbazi H, Ghofranipour F, Amiri P, Rajab A. Perceptions, enablers and nurturers related to self-care behaviors in adolescent with type 1 diabetes. JEM 2018;19:435-43.
8. Chemuru NR, Srinivas SC. Application of the PEN-3 cultural model in assessing factors affecting adolescent pregnancies in Rural Eastern Cape, South Africa. Int J Reprod Fertil Sex Health S 2015;1:1-8.
9. Peyman N, Ezzati-Rastgar K, Tehrani H. The Impact of educational intervention based on PEN-3 model on oral health behavior in elementary school students. Iran J Health Educ and Health Promot 2016;4:149-57.
10. Peyman N, Ezzati-Rastgar Kh, Tehrani H. Effectiveness of education by Pen-3 cultural model on improve feeding behaviors in adolescent girls with obesity and over weight in Razan City. Quarterly of the Horizon of Medical Sciences (HMS) 2013;18:254-60.
11. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today 2004;24:105-12.
12. Vicent NA. Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. J Emerg Trends Educ Res Policy Stud 2014;5:272-81.
13. Lewis CP, Newell JN. Patients’ perspectives of care for type 2 diabetes in Bangladesh: a qualitative study. BMC Public Health 2014;14:737.
14. Mousavizadeh SN, Askhtarob T, Ahmadi F, Zandi M. Evaluation of barriers to adherence to therapy in patients with diabetes. J Diabetes Nurs 2016;4:94-108.
15. Sabzamakan L, Aghari Jafarabadi M, Nikpajouh A, Bakhtari F. Determinants of physical activity among patients with cardiovascular metabolic risk factors based on the educational factors of PRECEDE model: A mixed method study. Iran J Health Educ Health Promot 2016;4:5-19.
16. Nadri A, Safania A, Amritash A. Determinant of the implementation of physical activities in elderly in Tehran. Johe 2016;1:66-79.
17. Amini M, Edighe Heydari Nejad S, Azmesha T. Identify factors inhibiting participation in physical activity with older people in Ahwaz TOPSIS model, instructional strategies and appropriate interventions. ARSM 2017;5:25-35.
18. Hossinzadeh K, Niknami Sh. Determinants of family’s self-efficacy for physical activity; A qualitative study. J Health 2018;7:288-301.
19. Mirghaffouri S, Sayadi Touraniou H, Mirfakhreddini S. The Analysis of Factors Affecting Women’s Participation in Sport (Female Students of Yazd University). J Sport Manag 2009;1:83-100.
20. Ilunga Tshiswaka D, Ibe-Lamberts KD, Whembolu GL, Fapohunda A, Tull ES. “Going to the Gym Is Not Congolese’s Culture”: Examining attitudes toward physical activity and risk for type 2 diabetes among congolese immigrants. Diabetes Educ 2018;44:94-102.
21. Casey MM, Eime RM, Payne WR, Harvey JT. Using a socioecological approach to examine participation in sport and physical activity among rural adolescent girls. Qual Health Res 2009;19:881-93.
22. Motameni A, Hemmati A. Identifying and prioritizing the barriers for Women’s sports activities. J Sport Manag Rev 2014;6:111-30.
23. Pourranjbar M, Khodadadi MR, Ghorbanzade B, Alamikoshki M. The correlation facilitating and inhibiting factors on participation in sports activities of female students in Kerman University of Medical Sciences. JHPM 2016;5:60-8.
24. Ghazanfari F, Niknami S, Ghofranipour F, Larijani B. Regular physical activity from perspective of females with diabetes: A qualitative study. Horizon Med Sci 2009;15:5-14.
25. Razm Ara T, Yektayar M, Abdi S. Investigating the barriers to nursing Women’s sports participation in public hospitals. Q J Phys Educ Sports Sci 2016;1:41-50.
26. Holt NL, Kingsley BC, Tink LN, Scherer J. Benefits and challenges associated with sport participation by children and parents from low-income families. Psychol Sport Exercise 2011;12:490-9.
27. Perez A, Fleury J. Using a cultural framework to assess motivation for physical activity among older hispanic women. Fam Community Health 2018;41:10-7.
28. Melancon J, Oomen-Early J, del Rincon LM. Using the PEN-3 model to assess knowledge, attitudes, and beliefs about diabetes Type 2 among Mexican American and Mexican Native Men and Women in North Texas. Int Electron J Health Educ 2009;12:203-21.
29. Scarinci IC, Bandura L, Hidalgo B, Cherrington A. Development of a theory-based (PEN-3 and health belief model), culturally relevant intervention on cervical cancer prevention among Latina immigrants using intervention mapping. Health Promot Pract 2012;13:29-40.
30. Eversley J. Physical activity from young Somalis' point of view: A Focus group study in the London Borough of Brent. Health Promot Pract 2012;13:29-40.
31. Arizi F, Vahida F, Parsamehr M. The study of social support effect on females participation at physical activities (Case study: Mazandaran females), Olympic 2006;14:77-86.