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Study on the lifestyle of disadvantaged women at risk of type 2 diabetes under the support of social welfare center of Zanjan city in 2018

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Abstract

Background: Women's lifestyle affects their health and having a healthy lifestyle reduces the risk of developing non-communicable diseases. Evidence suggests that disadvantaged women are more subject to the risk of non- communicable diseases such as type 2 diabetes.

Objectives: This study aimed to investigate the lifestyle of disadvantaged women at the risk of type 2 diabetes under the support of social welfare center of Zanjan city in 2018.

Methods: This cross-sectional study was performed on 287 women aged 65-35 and under the support of social welfare centers of Zanjan who were selected by Poisson random sampling. Data collection tools included a three-part questionnaire including demographic and background characteristics, an international physical activity questionnaire (IPAQ), and a Mini Nutrition Assessment questionnaire (MNA), filled out by a researcher at the social welfare center. Data were analyzed using descriptive-analytic statistical tests (mean index, standard deviation and one-factor analysis of variance, Kolmogorov-Smirnov) by applying SPSS software version 24.

***Results*:** The minimum and maximum age of women were 35 and 61 years, respectively, with a mean of 41.6(±9). The minimum and maximum body mass indexes were 16.2 and 42, respectively, with a mean of 26.1±4.3. In terms of education, the majority of women (42%) had Quranic-elementary education and concerning the income, 76% had insufficient income. As to the marital status, the majority of participants (69%) were widowed or divorced. According to the quantitative criterion of physical activity questionnaire (IPAQ), more than half of the women (60%) had low to moderate physical activity and according to the quality criterion of WHO physical activity, 89% of women had unfavorable physical activity. In terms of nutritional status, more than half of the women (50.5%) had poor nutrition.

Conclusion: The findings of the study indicated that the majority of women were undesirable in terms of physical activity and healthy nutrition. Therefore, interventional research is needed to find appropriate educational models to improve diabetes preventive behaviors in this population group.

Keywords: Behavior, prevention, women, deprived, type 2 diabetes

Introduction

Health promotion behaviors and healthy lifestyles are parts of the main strategies for maintaining health and have an important role in preventing chronic diseases such as type 2 diabetes [1]. Type 2 diabetes has increased due to the aging population, increasing population growth, urbanization and high prevalence of obesity and sedentary lifestyle [2]. As the third leading cause of death due to diseases, this disease causes four million deaths annually worldwide [3]. According to the world health organization (WHO), and the world diabetes federation in 2017, the number of people with diabetes is estimated to be around 425 million. The prevalence of type 2 diabetes is 7.7% in Iran [4] and according to world health

organization (WHO), the number of affected people will reach 1.5 million (8.6%) by 2025 [5]. Diabetes exposes people to physical disorders such as cardiovascular, renal, ocular, chronic ulcers [6] and psychological-social problems such as depression too [7].

Diabetes imposes a significant cost on society and it is expected that the global cost of treatment and prevention of diabetes reach more than $ 300 million annually by 2025 [8]. Among the risk factors of diabetes, except for genetic, behavioral and lifestyle factors such as low physical activity, obesity and inappropriate diet are the most important risk factors for diabetes [9]. In this regard, Walker et al. (2010), in a review study acknowledged that by changing lifestyle, the risk of type 2 diabetes could be reduced from 28% to 59% [10]. Type 2 diabetes is caused by the interaction of hereditary, behavioral, and environmental risk factors [11]. Environmental factors such as socioeconomic status are important predictors of the prevalence of type 2 diabetes and are considered as risk factors for diabetes [4,12].

Components of socioeconomic status include social class, income, occupation, education, housing, urban and rural life which are related to health indicators [13]. A review study by Whiting et al. on the prevalence of diabetes between 2011 and 2030 indicates that the prevalence of the disease is currently higher in low- and middle-income countries and these countries will experience a higher prevalence of diabetes in the next 19 years than developed countries [14]. The prevalence of diabetes is also related to educational level, occupation, and in some societies with marital status and gender. Gender is one of the influencing factors in diabetes. According to the WHO report (2011), the number of women with type 2 diabetes is higher than men (10.4% vs. 10%) [15]. In a study by Rahmanian et al (2011), in Jahrom, Fars province, the prevalence of diabetes was higher in women than in men (12.1% vs. 11.6%). This study also found that the prevalence of diabetes was higher in people with low socioeconomic status [16].

According to the mentioned statistics, women are more at risk of type 2 diabetes than men. Meanwhile, disadvantaged women with low socioeconomic status are at greater risk of diabetes due to the lack of awareness and environmental factors such as shortage of adequate space for exercise and lack of access to appropriate nutrition [8,9]. However, it is imperative to pay attention to the health of women who make up half of the population and take care of other family members [17] Designing educational interventions to prevent diabetes in this group of women requires evidence of lifestyle and diabetes prevention behaviors. Therefore, for the above reasons, the present study expanded to investigate the lifestyle of disadvantaged women at risk of type 2 diabetes under the support of social welfare centers of Zanjan city in 2018.

Methods

The present study is a cross-sectional descriptive-analytic study with a population of women under the support of social welfare centers in Zanjan city. Upon approval of the project in the research council of Social Determinant of Health Research Center and university research council (Code: A-11-149-6) and Zanjan University of Medical Sciences Ethics Committee (code: ZUMS.REC.1396.171), the researcher submits the official letter from the university to the department of social welfare and after coordination with the department of treatment and support of female-headed households, attended the research setting and collected data. In order to adhere to the research ethics, after explaining the research objectives and keeping the clients' information confidential and obtaining written consent from eligible participants, data collection was done by completing the anonymous questionnaire within 30 minutes.

According to existing records, at the time of sampling, there were about 1,120 people who referred actively to social welfare centers. According to Cochran's formulated with 95% confidence interval and statistical advisor's opinion with test error estimate 0.05, a total of 287 individuals were considered.

d=0.05; p=q=0.5; z=1.96.

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

With regard to the purpose of the study, the sampling method was a simple random Poisson type. Accordingly, 287 women who had referred to social welfare centers in Zanjan from

2018/07/06 to 2018/09/06 and met the inclusion criteria were included in the study. Participants' characteristics to enter the study included: not having a history of physical disabilities and chronic mental illness and lacking terminal illnesses (based on records), age between 35 and 65 years, positive family history of diabetes in first -degree relatives (father, mother, sister or brother) or other relatives.

Data collection tool was a questionnaire, non-stretchable tape measure for measuring height and scales (Seca model) with 0.05 kg accuracy for measuring weight (with minimum wear and without shoes) to determine body mass index (BMI).

The questionnaire using for collecting data had 3 parts. In the first part of the questionnaire, the demographic characteristics and contextual variables of participants were probed and included information on such as age (year), occupation, marital status and education. The second part included the standard IPAQ physical activity questionnaire (7 questions). In this tool, the intensity of physical activity is calculated based on both quantitative and qualitative criteria. According to quantitative measure, energy consumption is in terms of MET/min / Week [18]. According to the scoring protocol to calculate the total amount of quantitative physical activity per week, the amount of energy consumed in walking and intensive physical activity, moderate and sedentary physical activity is calculated in minutes. If the total calculated intensity of physical activity is less than 600, the person is considered inactive and if it is between 600-2999 or 3000 and more than that the individual is considered moderate and active (with favorable physical activity) respectively.

The WHO physical activity questionnaire was also used in the present study. According to the qualitative criterion, the total score without conversion to MET was calculated and physical activity less than 150 minutes or equal to that per week (excluding regular walking) is regarded as undesirable physical activity and more than 150 minutes per week as favorable physical activity [19,20].

The third part of the questionnaire included nutrition status questions. To evaluate nutrition status, Mini Nutrition assessment questionnaire (MNA) [21] was used. This questionnaire includes 17 questions which deal with how many days a week to consume and how many units of fruit and vegetables, dairy and eggs, legumes, meat and fish, carbohydrates and sugars, beverage types: water, tea and fruit juice, fat type and the oil, vegetable or animal, solid or liquid are used. Each of the above answer options has a score from 0 to 2. According to the scoring protocol minimum score was 0 and a maximum of 34. The cut-off point was also calculated using the mean of 17. Women with a score of 17 and more were considered to have favorable nutrition and those with a score of less than 17 were considered unfavorable. This questionnaire has been previously used by Masoumi et al. and the internal consistency of the tool using Cronbach's alpha is 0.98 [22].

Also, the validity and reliability of the IPAQ and WHO criteria in external studies have been reviewed [18,22,23]. In Iran, the reliability of the above physical activity questionnaire was reported in Seyed Emami et al. (2010) study, (α=0.748) and in Khosravi et al. (2012) study, α=0.76 [24,25]. The physical activity and diet questionnaire was previously used in Iran and Zanjan community [26]. Therefore, only the face validity of the instruments was evaluated in the present study. The reliability of the used scales was also measured for ten times. To measure the accuracy of the scales, every ten cases were compared with a 5-kg control weight.

Data were analyzed using descriptive tests including tables, mean indices, standard deviations and analytical statistics including one-way analysis of variance**,** using SPSS 24 software.

Results

Concerning the demographic and contextual characteristics of the participants, results showed that the mean age of the participants was (41.6±9/0). The majority of participants (73%) were housewives. In terms of literacy level, 42% had Quranic- elementary literacy. Demographic characteristics and quantitative and qualitative contextual variables are shown in tables 1 and 2.

Table 1: Distribution of demographic and background characteristics of women under the support of social welfare centers in Zanjan city 2018

Demographic variables		Frequency	Percent
Occupations	Housewives	209	73
	Temporary workers	48	17
	Permanent workers	13	5
	Seller	10	3
	Others	7	2
Education	Illiterate	8	3
	Qur'anic-elementary	121	42
	Guidance school	85	30
	High school	55	19
	University	18	6
Marital status	Married	92	32
	Divorced	105	37
	Widowed	90	31
Family income	Sufficient	6	2
	Insufficient	218	76
	Somehow sufficient	63	22
BMI	Moderate(18.5-24.5)	115	40
	Overweight (25-29.9)	117	40.8
	Obese(more than 30)	55	19.2

Table 2: Mean and standard deviation of quantitative characteristics including: age, body mass index, height and weight of women under the support of Zanjan social welfare centers 2018

Variables	Mean(SD)	Minimum	Maximum
Age(year)	41.6±9	35	61
BMI	26.1	16.2	42
Height(cm)	157.4	154	178
Weight(kg)	66.3	40	100

As for physical activity of disadvantaged women at risk of diabetes, the results of the study showed that more than half of the women (60%) had low to moderate physical activity behavior based on the IPAQ and according to the WHO quality criteria, 89% of the women had poor physical activity (Table 3).

Table 3: Physical activity status of women under the support of social welfare centers

Variables	Compliance rate	Frequency	Percentage
Physical activity behavior by quantitative criteria (IPAQ)	low activity (week/minute/MET 0-599)	64	22
	Moderate activity (week/minute/MET600-2999)	110	38
	Intensive activity (week/minute/MET≥3000-)	113	39
Physical activity behavior based on quality standards (WHO)	Favorable activity(more than 150 minutes per week)	31	11
	Unfavorable activity (less than 150 minutes per week)	256	89

In the study of the nutritional status of disadvantaged women at risk of diabetes, the results of the present study showed that 50.5% of the women had poor nutrition and 49.5% had good nutrition (Table 4).

Table 4: Nutrition status of women under the support of social welfare centers

Healthy nutrition		Frequency	Percentage
Healthy nutrition status by MNA scale	Poor nutrition Mean <17	145	50.5
	Good nutrition Mean ≥17	142	49.5

As regards the relationship between diabetes prevention behaviors of women under the support of social welfare centers with demographic characteristics, the results of the one-factor analysis of variance did not show a significant relationship between nutrition and physical activity with age, marriage, education, income, occupation and BMI of Women under study (Table 5).

Table 5: Relationship between diabetes prevention behaviors of women under the support of social welfare centers with demographic characteristics

Demographic and background characteristics	Physical activity P-value	Nutrition statues P value
Age	0/778	0/797
Marital status	0/694	0/537
Education	0/111	0/142
Income	0/256	0/750
Occupations	0/916	0/627
BMI	0/443	0/650

Discussion

The results of this study showed that more than half of the women (60%) had low to moderate physical activity based on the IPAQ questionnaire and 89% of the women had an unfavorable physical activity based on qualitative WHO criteria. Also, in terms of nutritional status, more than half (50.5%) of the women under study had poor nutrition. In the literature review, there was no study on examining dietary patterns and physical activity in disadvantaged women at risk for diabetes. Therefore, the results were compared with the present study. Similar to the results of the present study, Mazloomi et al. (2012) study in rural areas of Yazd showed that 84.3% of pre-diabetic patients had poor nutrition [27]. Similar to result of current study, in study conducted by Mazloomi et al. (2010) on 114 men and women over 30, at risk of diabetes in Taft city health centers, the rate of compliance to preventive measures of diabetes such as healthy diet and physical activity in the participants was completely unfavorable [28]. Contrary to the results of the present study, in the study of Jafarian Amiri et al (2010), 41.3% of diabetic patients had poor nutritional status and 21.4% had low physical activity [29]. In other words, the study population of Jafarian Amiri and colleges were more favorable in terms of nutrition and physical activity than the present study. The difference between the results of Jafarian Amiri and colleges' study with current study may be due to the different socioeconomic status and receiving more educational interventions from health workers due to diabetes). Also, a study was done by Abdollahi et al (2016) on 384 types 2 diabetic patients in Zanjan city showed that 50.4% of patients had poor nutrition and 93.5% of patients had a low physical activity based on IPAQ and 76.9% had low physical activity according to qualitative criteria (WHO) [26].

Comparison of the results of this study with the present study showed that both groups were almost similar in nutritional status but in terms of physical activity, according to the World Health Organization (WHO) scale, patients with diabetes were relatively better than those of disadvantaged women at risk. However, exercise has beneficial effects on preventing type 2 diabetes in pre-diabetic individuals [30].

The results of current study showed that only 40% of women under study had normal BMI and 40.8% were overweight and 19.2% obese. There are no sufficient studies to investigate overweight and obesity in advantaged and disadvantaged women. In this regard, Yagoubi et al. (2015)

reported that the prevalence of overweight and obesity in the women of Zahedan city was 11.9% and 22.4%, respectively [31]. Comparison of the results shows that the prevalence of obesity is higher among women in current study and this increase may be due to the increasing prevalence of obesity in women in Iran and the difference between the two communities too [32].

In the present study, there was no significant relationship between diabetes prevention behaviors including diet and physical activity with demographic characteristics including age, marital status, education, income, occupation and BMI. A study by Di Darloo et al. on diabetic women in Khoy city showed that women's participation in exercise decreased with age increase, and also there was an inverse relationship between education and physical activity. Also contrary to the results of the present study, there was a direct relationship between diabetes prevention behaviors and women's earnings ($p<0.005$) [33]. Opposite to the results of the present study, the study of Mehdi Zadeh et al. on 82 diabetic women in Mashhad city showed that physical activity decreased with age and body mass index increase [18]. While increase BMI is an important factor in the progression from healthy to pre-diabetes in women and its control is an important factor in preventing diabetes [34].

Consistent with the present study, Mazlumi et al. (2010) also found no significant relationship between marital status and body mass index with diabetes prevention behaviors in clients at risk for diabetes, but there was a significant relationship between education and preventive behaviors.

In other words, people with higher education could understand and adhere better to preventive behaviors [28]. However, in the present study, the lack of relationship between diabetes prevention behaviors and demographic and contextual factors, including education and body mass index can be justified since the population study was somewhat homogeneous in terms of demographic and contextual characteristics so that around 60% of individuals were overweight or obese and about 45% were illiterate or had elementary education and only 19% had high school education and 6% had university education. The present study showed that the majority of disadvantaged women at risk for diabetes had a poor condition in terms of diabetes prevention behaviors including physical activity and a healthy diet.

Having healthy nutrition and doing recommended physical activity require promoting the knowledge of the women under study about diabetes prevention and healthy lifestyles, as well as access to food and exercise facilities. Since this group of women is at risk of diabetes and failure to modify their lifestyle will lead to disease and costs increase. Therefore, it is necessary to conduct interventional research to find suitable models to empower this group of women to have a healthy lifestyle. This study was conducted on a limited number of women considering a limited number of diabetes prevention behaviors. Thus, there is a limitation to the generalization of the result of study. Therefore, it is recommended that similar research is done in provinces with different cultures and customs by taking into account other diabetes prevention behaviors with participating both men and women.

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Conflict of interest

None of the authors of this article has stated a conflict of interest.

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