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A comparative study of the effectiveness of self-management and group management on the amount of weight loss of nurses under low-calorie diet treatment: A simultaneous mixed-methods study

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Abstract:

BACKGROUND: Nursing is a profession that is associated with a lot of stress and a risk of being overweight or obese. The purpose of this research was to determine the comparative effectiveness of self-management (self-M) and group management (group-M) on nurses who were following a diet with the aim of proposing a proper planning and a healthy lifestyle for them.

MATERIALS AND METHODS: This study was a simultaneous mixed-methods design (interventional and qualitative). The participants were all overweight or obese nurses working in teaching hospitals at Guilan University of Medical Sciences in 2019 ($n = 96$). In the qualitative part, data were extracted from semi-structured interviews. For quantitative data analysis, relevant statistical methods such as Kolmogorov–Smirnov test, analysis of variance (ANOVA), and analysis of covariance (ANCOVA) were used. For qualitative data analysis, the conventional content analysis approach was used and Lincoln and Guba's criteria were applied to ensure the accuracy of the data.

RESULTS: In both quantitative and qualitative sections, the results showed that following a diet treatment with group-M is more effective than self-M.

CONCLUSION: The results showed that a healthy lifestyle can be achieved for nurses if they participate in training classes and group programs, which are proven to be effective based on this article and some other studies. Also, since weight gain and obesity, as one of the most important problems of health systems, continue to increase and can impose a heavy economic and social burden on human societies, various general policies should be used and these solutions can range from home to society to prevent and control them.

Keywords:

Adherence, clinical trial, diet, obesity, management, qualitative study

Introduction

The growing trend of obesity has become an important public health problem worldwide.[1,2] The World Health Organization (WHO) has reported that more than 1.9 billion adults suffer from overweight and 650 million suffer from obesity.[3] In Iran, we are observing a dramatic increase in the prevalence of overweight and obesity.[4] In the United States, the rate of obesity in men and women is almost the same, while in Iran, a

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developing country, this rate is higher in women than in men.[1]

Obesity is associated with life-threatening complications such as heart disease, increased economic burden, and numerous psychological consequences such as depression, reduced quality of life, and death.[5,6]

Various factors play a role in the occurrence of overweight and obesity, among which metabolic and genetic abnormalities can be mentioned, and in the vast majority of cases, it seems that obesity is initially related to an unhealthy lifestyle.[7]

Nursing is a profession that is associated with a lot of stress due to different types and shifts of work, and a risk of being overweight or obese exists for nurses[8] and rate of overweight and obesity in nurses depends on the country, race, age, and type of work.[9] There is growing recognition of the influence of the workplace environment on the eating habits of the workforce, which in turn may contribute to increased overweight and obesity.[10]

There is evidence of a growing prevalence of overweight and obesity in nurses and that obesity is significantly higher among nurses compared with other healthcare professionals and people working in non-health-related occupations.[11] In a study conducted in 2018 in Poland, about 44% of female nurses were obese or overweight.[7] Another study about Scottish nurses showed that 69% of them were overweight or obese.[12] In the study conducted by Najafabadi and Rezaei in 2016, it was concluded that nurses were at an average level in terms of doing health-promoting activities.[13]

Although nurses are the largest group of health service providers and fulfill various responsibilities such as educational care to different groups of people and patients, the defects in nurses' health behavior will prevent them from setting a good example for themselves.[7]

Suffering from obesity not only causes nurses to be exposed to health risks, which consequently results in various functional limitations related to poor health including limited mobility and increased care injuries,[14] but also puts economic pressure on nurses in the long term such as direct costs of diagnosis and treatment, as well as indirect costs, like reduced productivity due to absenteeism, disability, early retirement, and early death.[15]

Since dietary modifications can have a significant effect on biomarkers of noncommunicable diseases and disease symptoms of clinical conditions, nutritional counseling is known as the first-line approach to manage these cases[16] and it has been proven to be effective in many cases of diseases, cancer, and other clinical conditions.[17]

The majority of obese people are aware of the importance of modifying their lifestyle; however, for various reasons, they face problems when they want to start or continue their diet.[18] In this regard, although the majority of nurses have a positive attitude toward following a diet, when they are in stressful working conditions, they are likely to forget to follow correct eating habits and diets.[19]

Adherence to diet therapy consists of a range of behavior of a person in her/his lifestyle, which is necessary for nurses in accordance with the recommendations given in relation to diet therapy with the aim of changing lifestyle and preventing or reducing obesity.[20]

In a number of studies, two methods of self-management (self-M) and group management (group-M) have been investigated in relation to following treatment diets.[4,16]

Self-M provides a method that an individual plays a central role in improving his/her level of health and preventing and controlling his disease[11] and is a strategy with the help of which a person can increase a positive behavior or a skill or even eliminate an inappropriate behavior.[21] If people are successful in this regard, they will consider keeping that decision as a way of helping themselves.[18]

Also, group-M is an important category that requires the attention of all societies. Keith Davis believes that participation is a mental and emotional conflict of individuals in group situations that motivates them to achieve success to achieve group objectives, and this method is currently used in both developed and developing countries.[22] In Sadri Damirchi *et al.'s* study, results indicated that group therapy could significantly enhance psychological well-being and life expectancy.[23]

Considering the high rate of weight gain in Iran, especially in Guilan Province, the significant number of female nurses raises awareness about the importance of following a diet among people, including nurses, who play an important role in the health and education of society. Examining the numerous studies conducted by researchers shows that only a few research studies were conducted in the field of obesity management among nurses. Therefore, we decided to carry out a research study to compare the effectiveness of self-M and group-M in the following diet among nurses working at Guilan University of Medical Sciences. By being aware of the factors that play a role in following a diet, it is possible to have a healthy lifestyle by having an appropriate diet and controlling weight through proper planning

and emphasizing the positive influencing factors and eliminating or reducing the negative ones.

Materials and Methods

Study design and setting

The present research was a simultaneous mixed-methods study. Settings were teaching hospitals at Guilan University of Medical Sciences: Porsina, Razi, Alzahra, Heshmat, and Shafa.

Study participants and sampling

The participants were all overweight or obese nurses working in teaching hospitals at Guilan University of Medical Sciences in 2019 (n = 96). The inclusion criteria consisted of having a body mass index (BMI) of more than 25 kg/m^2, age over 18 years, not having a weight loss program in the last 6 months, and not using other weight loss methods such as taking drugs or exercising during the study period. People who suffered from diabetes, cancer, or kidney failure and patients using nonsteroidal anti-inflammatory drugs were not included in the study. The exclusion criteria consisted of personal unwillingness to participate in the study, pregnancy, and breastfeeding. Participants were also excluded from the study if they were unwilling to continue participating in the study.

Since each hospital was considered for one specific intervention method, therefore the allocation of samples to the studied groups was done in a nonrandom manner, so that the nurses with entry conditions from Porsina, Razi, Alzahra, Heshmat, and Shafa Hospitals were included in the study. As a result, Porsina and Razi Hospitals were considered for the intervention of treatment diet with self-M and Heshmat and Shafa Hospitals were chosen for group-M and Alzahra Hospital was considered the control group that did not receive any intervention. A simple random sampling method was used for the selection of nurses (the list was generated using a table of random numbers). In one group, the diet was followed by individuals as members of a group who accompanied each other, and in the other group, the nurses followed the diet individually using a self-M method, while in the control group, there was no intervention. Sampling was performed in two shifts, morning and evening.

Data collection tool and technique

This study used a concurrent triangulation design, so the researchers implemented both quantitative and qualitative methods. During data collection, there was an interaction between the two quantitative and qualitative data sources, and the results obtained from these sources completed each other in the interpretation stage. This method was chosen to cover all aspects related to the role of self-M and group-M in following the diet.

Quantitative data collection

The sample size was based on the determination of the average weight loss difference in the two intervention groups based on the results of the study by Rigsby *et al*. (05/0= α ،20/= ß).[24] At least 32 samples were estimated for the drop of samples during the study and correction of the number of comparisons for the three groups. For 8 weeks, a diet containing 55% carbohydrates, 15% protein, and 30% fat was prescribed to all the people in the intervention groups (two groups of self-M and group-M) for weight loss by a nutritionist. The amount of energy needed at the beginning of the study was calculated based on the person's age, height, and current weight using the Harris–Benedict formula, and 1000 calories less than that was prescribed to the person (considering at least 1200 calories per day for each person). The people under study were asked to avoid weight loss drugs and heavy physical activity during the study and to walk 30 minutes a day on average. Besides registration of demographic information, at the beginning of the study, week 4 (middle of the study), and week 8 (the end of the study), weight, height, and waist circumference (WC) were measured with valid and reliable instruments, and BMI was also calculated. The control group was also asked to have their own routine meals during the study period, to avoid weight loss drugs and heavy physical activity, and not to change their diet or exercise.

A lever scale with an accuracy of 0.1 kg connected to a calibrated height meter with an accuracy of 0.1 cm was used to measure the height and weight of the participants. People's height and weight were measured without shoes and with minimal clothes on. Finally, BMI was calculated based on the formula. People's WC was also measured using a tape measure. To measure the WC, the WC was measured at the lowest lumbar point, in the middle between the lowest rib edge and the upper edge of the iliac spine on both sides using an elastic measuring tape. If the difference between the two measurement results was more than 2 cm, the third measurement was performed and the average of two closer values was recorded as WC. To investigate the intervention effect of the studied treatment diet, the outcomes evaluated in two groups were compared with each other, and to investigate the role of self-M or group-M, they were compared with each other.

In the present research, in one group, 32 nurses followed a diet program determined by a nutritionist. Also, the members of the group shared their experiences with the members in face-to-face meetings in three sessions (at the beginning of the study, the fourth week, and the end of the study). Also, in the intervals between the meetings, there was communication with the group members

through social channels to encourage people to follow the diet. In the other group, the diet prescribed by the nutritionist was followed individually by each participant and the interview with these people (at the beginning of the study and the fourth and last weeks of the study) was also performed through individual sessions.

Qualitative data collection

With the information obtained from the participants' experiences and also their understanding, all the factors that played a role in this topic were realized. Qualitative content analysis using a conventional approach was used in this part of the study. In this method, the interviews were directly aimed at understanding the experiences of the participants without imposing predetermined categories. In the next step, the codes and classes were directly and inductively extracted from the raw data.[25]

To collect data, sampling was started in a targeted manner and continued based on theoretical sampling until data saturation was achieved, a point at which the interviews did not add any new information to the data. The main method of data collection was a semi-structured interview that was held in a suitable and quiet place in the hospital. Interviews started with open questions such as "Please tell us your experiences regarding the role of self-M/group-M in following a diet" and continued with exploratory questions. The interviews were recorded with the participants' permission, and immediately after conducting the interview, each interview was transcribed word by word and then coded. After analyzing each interview, the next interview was conducted.

Ethical consideration

First, the project was registered with the Research and Technology Vice-Chancellor of Guilan University of Medical Sciences and the country's clinical trial site, and after receiving the clinical trial code, permission to conduct the research was obtained from the head of educational hospitals by obtaining a letter of introduction. At the time of data collection, first, the researcher introduced herself and the objectives of the research, and the participants were assured about the confidentiality of all the information obtained. Furthermore, permission was obtained from the participants and they allowed the researcher to record their voice. The participants were also informed that they can withdraw from the study whenever they wish. Moreover, the control group was told that if they wish, a diet plan will be provided to them.

Data Analysis

Quantitative data analysis

Statistical analysis

The data were described by mean (standard deviation (SD)) or frequency (percent). All quantitative data were normally distributed based on the Kolmogorov–Smirnov test. To compare the baseline quantitative measures between groups, a one-way analysis of variance (ANOVA) with a least significant difference (LSD) *post hoc* comparison test was performed. Qualitative characteristics were compared among groups by the Chi-square test. To compare the post-intervention outcomes between groups, the analysis of covariance (ANCOVA) was performed, adjusting to the baseline values recorded before any interventions. All pre-assumptions for ANCOVA were tested and met. Adjusted means and related 95% confidence intervals and partial eta-squared values were reported. Partial eta-squared values of 0.01 to 0.06 were considered as small, 0.06 to 0.14 as medium, and more than 0.14 as large effect, respectively. Partial eta-squared values lower than 0.01 indicated a negligible effect. All analyses were performed by Statistical Package for the Social Sciences (SPSS) software version 21.0 (IBM Corp., Armonk, NY).

Qualitative data analysis

The conventional content analysis was used to analyze the data, and they were processed with a systematic and transparent 7-step method: 1. The interviews are transcribed and sorted, 2. each text was read several times to decide on the units of analysis, and 3. codes and classes were developed. While the classes were extracted from the raw data with an inductive approach and with continuous comparison, the distinction between the classes was made, 4. the coding was done according to the text sample, and a sample of the text is converted into a code using the method suggested by Polit *et al*.,[26] and then, the stability of the coding is checked. Next, the coding process was repeated and the data were prepared with the proper organization for coding the next steps. 5. All the text was coded, and during this process, the agreement between the opinions of the participants and the members of the research team was ensured. 6. The consistency in the resulting coding was checked and rechecked. 7. Conclusions were drawn about the coded data, and structures of meanings were presented based on the conclusions reached from the data.

The criteria proposed by Lincoln and Guba, including credibility, confirmability, dependability, and transferability, were used to ensure the correctness and accuracy of the data.[27]

The reliability was checked by the members of the research team and experts (peer check or faculty member check), and the accuracy of the coding process was investigated. Validity or acceptability in data collection was accomplished with triangulation methods such as semi-structured interview, review of quantitative

documents, and temporal integration including review at different times, the possibility of feedback to the data, prolonged engagement of the researcher with subject matter, and comparative and continuous analysis. Also, using the repeated study method, continuous comparison of data, and summarizing and categorizing information without damaging the data confirmed data validity in this study. Saving the documents related to the study, researchers' interest and long-term contact with this subject, and the efforts made to find out the opinions of the people participating in the research were among the other determining factors reassuring confirmability. By providing a complete description of obtained results, the characteristics of the participants, the method of research, and the transferability of the data were reached with the aim of making it possible for others to follow our research method.

Results

Quantitative results

In total, 97 overweight or obese nurses with a mean of 38.38 years old (SD: 8.76, range: 25 to 57) were entered into the analyses. All participants were female. Seventy percent of participants were overweight, and 30% were obese. Sixty-nine (70%) nurses were married, and eighty-six (88%) have bachelor's degree [Table 1 and Figure 1]. Nurses' characteristics are shown in Table 1. Education, marital status, weight, and strata of BMI at the beginning of the study did not differ significantly between groups ($P > 0.05$ for all, Table 1); however, because of cluster assignment of participants to the groups, age ($P < 0.001$), WC ($P < 0.001$), and quantity of baseline BMI ($P = 0.014$) were relatively different between groups. Nurses in the group-M intervention group were older with higher BMI and more WC size. So, to compare the impact of interventions, baseline values measured at the beginning of the study were controlled in the analyses.

Weight, WC, and BMI measures of participants at 4 and 8 week's assessment times after the beginning of the intervention are shown in Table 2. On average, after 8 weeks of intervention, participants' weight decreased by around 1.34 kg and 1.99 kg in the self-M and group-M, respectively. Also, WC decreased by 2.14 cm and 3.17 cm in the self-M and group-M, respectively. Furthermore, their BMI reduced to 0.53 kg/m^2 and 0.78 kg/m^2 in the self-M and group-M groups, respectively.

In the 4 and 8 weeks after the intervention, controlling for the baseline values, the results of the analysis of the covariance showed that all characteristics of weight, WC, and BMI were significantly lower in both intervention groups compared with the control group [Table 2] and both interventions were effective. However, the impact of two intervention groups of self-M or group-M

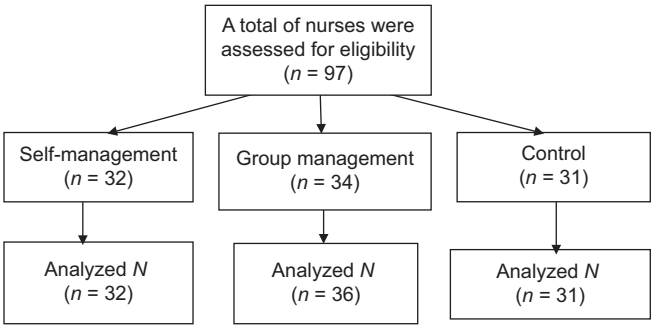

Figure 1: Consort flow diagram of patient's selection and allocation *** Because of cluster assignment of participants to the groups, age ($P < 0.001$), waist circumference ($P < 0.001$), and quantity of baseline BMI ($P = 0.014$) were relatively different between groups

Table 1: Demographic and anthropometric characteristics of participants at the baseline

Factor	Total (*n*=97)	Intervention			*P**
		Self-management (*n*=32)	Group management (*n*=34)	Control (*n*=31)	
Education, no. (%)					0.535**
Bachelor's degree	88 (89)	30 (88)	31 (91)	27 (87)	
Master's degree	8 (8)	2 (6)	2 (6)	4 (13)	
Marital status, no. (%)					0.148**
Single	21 (22)	9 (28)	2 (6)	10 (32)	
Married	69 (71)	22 (69)	29 (85)	18 (58)	
Divorced	4 (4)	1 (3)	1 (3)	2 (6)	
Widowed	2 (2)	0 (0)	1 (3)	1 (3)	
Age (years)	38.4 (8.8)	36.2 (6)	46.8 (6)	31.6 (6.1)	<.001
Weight (kg)	75.3 (8.9)	76.3 (8.5)	76.7 (10.4)	72.6 (7.3)	0.127
BMI (kg/m^2)	29.2 (3.4)	28.8 (3.2)	30.6 (4.1)	28.2 (2)	0.014
BMI category, no. (%)					0.086**
Overweight	68 (70)	22 (69)	20 (59)	26 (84)	
Obese	29 (30)	10 (31)	14 (41)	5 (16)	
WC (cm)	90.3 (10.3)	89.3 (10.4)	96.4 (8.5)	84.6 (8.5)	<.001

All participants were women. Education and marital status were missing for one nurse. The values are mean (standard deviation) unless otherwise indicated. BMI=body mass index; WC=waist circumference. **P*-value was reported from a one-way analysis of variance. ** *P* value was obtained from the Chi-square test

Table 2: Anthropometric characteristics of participants at baseline, week 4, and week 8 post-intervention

Factor	Group	Baseline	Week 4	Week 8	Adj. mean (95% CI)*			
					Week 4	*P***	Week 8	*P***
Weight (kg)	Self-management	76.3 (8.5)	75.64 (8.5)	75.15 (8.7)	74.60 (74.28-74.91)	<.001	74.13 (73.70-74.56)	<.001
	Group management	76.72 (10.4)	75.81 (10.3)	74.91 (9.9)	74.35 (74.04-74.65)		73.48 (73.06-73.89)	
	Control	72.56 (7.3)	72.61 (7.4)	72.84 (7.4)	75.28 (74.96-75.60)		75.47 (75.03-75.91)	
BMI (kg/m^2)	Self-management	28.77 (3.2)	28.52 (3.2)	28.34 (3.3)	28.95 (28.83-29.08)	<.001	28.77 (28.60-28.94)	<.001
	Group management	30.58 (4.1)	30.21 (4.1)	29.86 (4.0)	28.86 (28.74-28.98)		28.52 (28.35-28.69)	
	Control	28.16 (2.0)	28.18 (2.0)	28.27 (2.1)	29.21 (29.09-29.34)		29.30 (29.13-29.47)	
WC (cm)	Self-management	89.28 (10.4)	88.53 (10.4)	87.73 (10.6)	89.54 (88.96-90.12)	0.004	88.74 (88.07-89.40)	<.001
	Group management	96.42 (8.5)	95.17 (8.7)	93.74 (8.6)	89.13 (88.53-89.74)		87.71 (87.02-88.41)	
	Control	84.65 (8.5)	85.06 (8.5)	85.31 (8.4)	90.65 (90.02-91.27)		90.88 (90.16-91.60)	

The values are mean (standard deviation) unless otherwise indicated. SD=standard deviation; CI=confidence interval; BMI=body mass index; WC=waist circumference. *Measures of week 4 or 8 post-intervention adjusted to the baseline measure and related 95% confidence interval of means were reported. **_P_-value was reported from analysis of covariance to compare adjusted means between groups. Pairwise comparisons showed significant difference ($P<0.05$) between both intervention group and control group in all assessments. Also, the comparison between social management and self-management groups showed marginally significant differences in 8-week assessments ($P<0.1$). Other pairwise comparisons were not significant ($P>0.05$)

was not significantly different for weight ($P = 0.779$, partial eta-squared = 0.014), WC ($P = 1.00$, partial eta-squared = 0.010), and BMI ($P = 0.844$, partial eta-squared = 0.012) in 4 weeks after the interventions.

Eight weeks after the interventions, the results of the ANCOVA showed that weight ($P = 0.097$, partial eta-squared = 0.048), WC ($P = 0.119$, partial eta-squared = 0.045), and BMI ($P = 0.124$, partial eta-squared = 0.044) were slightly lower in the group-M intervention group than in the self-M group. Although the differences were not significant regarding the measure of the effect sizes (partial eta-squared between 0.01 and 0.05), the weakly group-M intervention tends to be more effective compared with the self-M intervention.

Qualitative Results

The participants who took part in the interviews were nurses participating in diet intervention hospitals who met the criteria for entering the study (mentioned in the method section). These interviewees were chosen through purposive sampling and continued until data saturation was reached (28 people). Based on the interviews, 655 primary codes were extracted, and after reviewing the codes several times and summarizing, three main themes and seven subthemes were determined and named [Table 3].

The challenge of management of weight/obesity control

Regarding how to control weight and obesity, the nurses noted that despite the great desire to do this, the great variety of work shifts can be their main challenge in coordinating work and diet. "*Ever since I can remember, I have been overweight and losing weight has always been a dream for me, which unfortunately, with this my job, I can no longer control it*" (No. 7, 51 years old). "*Following a diet is much easier for many people than us nurses who are always full of stress in different work shifts. We endure so much stress during shifts that we no longer have the ability to plan and follow a diet*" (No. 12, 40 years old).

Improvement/doubt in individual self-efficacy

Participants' opinions regarding self-M in diet were different. Some consider individual diet compliance as a factor for self-awareness of personal responsibility/sense of individual independence and increasing self-confidence, and some consider continuous individual diet compliance as a difficult and impossible plan, and after several days of starting the diet, they were not willing to continue. "*The individual program is easy to implement and makes you more responsible for following the diet and an individual's self-confidence increases*" (No. 14, 32 years old). "*In the first few days, my diet was going well, but after a few days, it became very difficult for me to follow the diet and I wanted to know how others were following their diet*" (No. 3, 46 years old).

Positive effect of the group

The majority of the participants cited it more efficient to follow the diet in the group that aids them follow their diet more precisely. They mentioned getting support from other members of the group and comparing their weight changes with each other as a motivating factor. "*After a few days when I was tired of following the diet, one of my group mates told me: You have followed the instructions very carefully so far and if you continue like this, the result will be very good. Her support was effective and made me follow my diet*" (No. 22, 38 years old). "*You can always compare your performance with others in the group, I was aware of how much weight my group members had lost and this comparison helped me to examine my possible problems in following the diet*" (No. 9, 28 years old).

Discussion

The aim of this mixed-methods research was to determine the comparative effectiveness of self-M and group-M on the weight loss rate of nurses undergoing low-calorie diet

Table 3: Main themes and subthemes perceived based on nurses' experiences

Subtheme	Main theme
Controlling weight and obesity, a constant desire and difficult	The challenge of management of weight/obesity control
Inability to control and diet coordination with different work shifts	
Self-awareness of responsibility/ sense of individual independence	Improvement/doubt in individual self-efficacy
Increasing the self-confidence	
Discontinuance in continuing the individual's diet	
Gaining support from others	Positive effect of the group
Comparing your weight with others	

treatment. Of the total of 97 nurses participating in this research, 70% of the participants were overweight and 30% were obese. The results of some other interventions in Iran and other countries also indicate the presence of overweight and obesity[7,8,12] and an increase in the number of nurses.[12]

A large number of overweight and obese nurses mentioned that despite their desire to lose weight, they are not able to follow a proper diet due to being in a nursing job that involves different work shifts and is full of stress. The nature of the nursing profession, which is associated with stressful conditions, can bring the risk of being overweight or obese for nurses,[8] Various factors play a role in the occurrence of overweight and obesity, and the type of person's job is one of the important influential factors.[7] In this regard, it can be stated that nursing is a profession that is associated with a lot of stress and types and different shifts of work, which can be a reason for increasing the stress of nurses.[8] This issue can cause that despite the positive attitude of most nurses toward diet compliance, the existence of different work shifts with stress does not allow them to follow the diet correctly since being overweight and obese can be associated with a decrease in their health and performance level.[14] As a result, it seems essential for nurses to watch their weight. In this regard, in the research of Najimi *et al.*, one of the obstacles to nonadherence to medication in patients with high blood pressure is lifestyle, and the type of job can be one of the lifestyle behaviors of people.[28]

The effectiveness of following a diet in reducing the weight of nurses has been mentioned in a number of other studies as well.[13,18] The findings of Kheirabadi *et al.* indicate the effect of education on public health.[29] Also, in the study of Amini *et al*., the self-care program showed a significant result in changing the diet, but the program did not show a significant change in stress management,[30] which could be due to the difference in the participants who were cardiac patients.

The results of the present study showed no significant difference in weight loss, WC, and BMI between the two groups of self-M and group-M after 4 weeks of intervention. However, 8 weeks after the interventions, the results showed that the group-M was more effective than the self-M. Although the differences were not significant, according to the measurement of the effect sizes, the group-M intervention has been shown to be slightly more effective than the self-M intervention.

The results of the interviews showed that the nurses were more satisfied with participating in the group diet plan, and they considered this method a suitable way to lose weight since they can get support from others and compare their weight loss progress with others. In this regard, the results of some other research studies have shown the greater effectiveness of group-M with the aim of weight loss.[22,24,25]

Although, according to a number of participants, an individual diet brings a sense of individual independence and responsibility, it also brings an increase in self-esteem. In this regard, it can be stated that the participants in the current research were female nurses, and considering their ability to manage life plans alongside work, they considered self-care to be related to individual independence and responsibility. Also, in the results of the research by "Moehbi" and colleagues, self-care was seen more in women than in men.[31]

However, some other participants reported experiencing fatigue and the desire to stop dieting during the self-M plan. In fact, although in self-M programs, a person uses a strategy with the aim of creating and promoting a positive behavior through which they can achieve independence and self-M,[18,21] in group-M people are placed in a situation in which they receive support of other members and they engage in a kind of competition.[22] Social support by members of a group can play a key role in positively influencing dietary decisions.[25]

Conclusion

Based on the results of the present research, the group diet program was more effective in reducing weight, waist size, and BMI than the self-M program and has shown that they are more satisfied with participating in the group-M program with a sense of gaining support and a sense of competition.

Although the results of some studies showed the positive attitude of nurses toward diet and weight control, due to stressful work conditions, it is possible for nurses to forget to follow a proper diet. It can be realized that a healthy lifestyle can be achieved for nurses with proper

planning and emphasis on positive factors and eliminate the negative ones. Also, since weight gain and obesity, as one of the most important problems of health systems, continue to increase and can impose a heavy economic and social burden on human societies, various general policies should be used to prevent and control them and these solutions can range from home to society.

Because the present research has been conducted in Guilan Province, it is suggested to carry out extensive studies in other provinces to achieve more generalizable results.

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Conflicts of interest

There are no conflicts of interest.

References

1. Baldoni NR, Aquino JA, Alves GCS, Sartorelli DS, Franco LJ, Madeira SP, *et al*. Prevalence of overweight and obesity in the adult indigenous population in Brazil: A systematic review with meta-analysis. Diabetes Metab Syndr 2019;13:1705-15.
2. Sasan Far HR, Sha Bahari R, Pazoky A, Pishgah Roudsari M, Ghanbari Golfaee A. The effectiveness of combined cognitive group therapy and diet therapy on obese women's weight-loss and self efficacy. RJMS 2016; 23 (148) :11-19. URL: http://rjms.iums.ac.ir/article-1-3390-en.html.
3. World Health Organization. Obesity and Overweight. Geneva: World Health Organization; 2018. Available from: http://www.who.int/mediacentre/factsheets/fs311/en/. [Last accessed on 8 January 2018].
4. Beyzai B, Neshatbini Tehrani A, Hekmatdoost A, Rashidkhani B. Relation between adherence to mediterranean dietary pattern with overweight and obesity among female adolescents in Tehran. Iranian Journal of Nutrition Sciences & Food Technology 2016;10:41-52. [in persian]
5. Seib C, McGuire A. Perspectives on the management of overweight and obesity. Case Rep Womens Health 2019;22:e00116.
6. Weiderpass E, Botteri E, Longenecker JC, Alkandari A, Al-Wotayan R, Al Duwairi Q, *et al*. The prevalence of overweight and obesity in an adult Kuwaiti population in 2014. Front Endocrinol (Lausanne) 2019;10:449.
7. Woynarowska-Sołdan M, Panczyk M, Iwanow L, Gałązkowski R, Wójcik-Fatla A, Panasiuk L, *et al*. Associations between overweight and obesity and health enhancing behaviours among female nurses in Poland. Ann Agric Environ Med 2018;25:714-9. doi: 10.26444/aaem/99641.
8. Adriaenssens J, De Gucht V, Maes S. Determinants and prevalence of burnout in emergency nurses: a systematic review of 25 years of research. Int J Nurs Stud 2015;52:649-61.
9. Peplonska B, Bukowska A, Sobala W. Association of rotating night shift work with BMI and abdominal obesity among nurses and midwives. PLoS One 2015;10:e0133761.
10. Nicholls R, Perry L, Duffield Ch, Gallagher R, Pierce H. Barriers and facilitators to healthy eating for nurses in the workplace: An integrative review. J Adv Nurs 2017;73:1051-65.
11. Kelly M, Wills J. Systematic review: What works to address obesity in nurses? Occup Med 2018;68:228-38. doi: 10.1093/occmed/kqy038.
12. Kyle RG, Neall RA, Atherton IM. Prevalence of overweight and obesity among nurses in Scotland: A cross-sectional study using the Scottish Health Survey. Int J Nurs Stud 2016;53:126-33.
13. Najafabadi H M, Rezaei B. The health promotion behaviors and its correlation with selected professional factors in nurses. Journal of Health Promotion Management 2017;6:28-35. DOI: 10.21859/jhpm-07014[in persian].
14. Jordan G, Nowrouzi-Kia B, Gohar B, Nowrouzi B. Obesity as a possible risk factor for lost-time injury in registered nurses: A literature review. Saf Health Work 2015;6:1-8.
15. Abdi J, Eftekhar H, Mahmoodi M, Shojaeizadeh D, Sadeghi R. Perceptions of Employees on Psychological Factors Affecting Obesity: A Qualitative Study. J Qual Res Health Sci 2016; 4(4): 363-71.
16. Volkert D, Beck AM, Cederholm T, Cruz-Jentoft A, Goisser S, Hooper L, *et al*. ESPEN guideline on clinical nutrition and hydration in geriatrics. Clin Nutr 2019;38:10-47.
17. Orell H, Schwab U, Saarilahti K, Österlund P, Ravasco P, Mäkitie A. Nutritional counseling for head and neck cancer patients undergoing (Chemo) radiotherapy—A prospective randomized trial. Front Nutr 2019;6:22.
18. Kaveh O, Peyrovi H. Exploring the experiences of Iranian women regarding obesity self-management: A qualitative study. Open Access Maced J Med Sci 2019;7:2377-83. https://doi.org/10.3889/oamjms. 2019.632
19. Blake H, Watkins K, Middleton M, Stanulewicz N. Obesity and diet predict attitudes towards health promotion in pre-registered nurses and midwives. Int J Environ Res Public Health 2021;18:13419.
20. Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and health-promoting behaviors: Knowledge may not translate into self-care. AORN J 2017;105:267-75.
21. Griva K, Mooppil N, Seet P, Krishnan DSP, James H, Newman SP. The NKF-NUS hemodialysis trial protocol-A randomized controlled trial to determine the effectiveness of a self management intervention for hemodialysis patients. BMC Nephrol 2011;12:4. Available from: https://bmcnephrol.biomedcentral.com/articles/10.1186/1471-2369-12-4
22. Iran Nezhad Parizi M, Amini Sabegh Z, Asad Pour V. The role of participatory management in promoting the professional ethics of the employees of the central offices of the Maskan bank. J of Quantitative studies in management. 2014;5:149-74. [in persian].
23. Sadri Damirchi E, Ghomi M, Esmaeli Ghazi Valoii F. Effectiveness of life review group therapy on psychological well-being and the life expectancy of elderly women. Salmand: Iran J Ageing 2017;12:312-25.
24. Rigsby A, Gropper DM. Gropper SS. Success of women in a worksite weight loss program: Does being part of a group help? Eat Behav 2009;10:128-30.
25. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res 2005;15:1277-88.
26. Polit DF, Beck Ch T. Essentials of Nursing Research: Methods, Appraisal, and Utilization (Essentials of Nursing Research (Polit)). 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006

27. Guba EG. ERIC/ECTJ Annual Review Paper: Criteria for assessing the trustworthiness of naturalistic inquiries. Educational Communication and Technology 1981;29:75-91.
28. Najimi A, Mostafavi F, Sharifirad Gh, Golshiri P. Barriers to medication adherence in patients with hypertension: A qualitative study. J Edu Health Promot 2018;7:24.
29. Kheirabadi G, Shirani M, Keshvari M, Sharifirad G, Bahrami M. The effect of training program of health promotion behaviors on geriatric general health components. J Edu Health Promot 2021;10:482
30. Amini R, Rajabi M, Omidi A, Soltanian A, Esmaili M M. The effect of health-related lifestyle self-management intervention on health promotion behaviors in patients with ischemic heart disease. Avicenna J Nurs Midwifery Care 2016; 24 (3) :174-183. URL: http://nmj.umsha.ac.ir/article-1-1467-en.html.
31. Mohebi S, Parham M, Sharifirad G, Gharlipour Z, Mohammadbeigi A, Rajati F. Relationship between perceived social support and selfcare behavior in type 2 diabetics: A cross-sectional study. J Edu Health Promot 2018;7:48.