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İnfertil Kadınlara Değişim Aşamaları Modeli ile Yapılan Bireysel Danışmanlık Girişiminin Kilo Yönetimine Etkisi

Effect of Individual Counseling Intervention on Weight Management Based on Stages of Change Model Conducted on Infertile Women

Çiler YEYĞEL[1 A,C,D,E,F], Oya KAVLAK[1 A,B,E,F,G]

[1]Izmır Tınaztepe University, Midwifery Department, Izmır, Turkey

[1]Ege University Faculty of Nursing, Women's Health and Diseases Nursing Department, Izmır, Turkey

ÖZ

Amaç: İnfertil kadınlarda Değişim Aşaması Modeli ile yapılan bireysel danışmanlık girişiminin kilo yönetimine etkisini değerlendirmektir.

Yöntem: Bu çalışma danışmanlık ve takip olmak üzere iki aşamadan oluşmaktadır. Araştırmanın evrenini, 4 Ocak 2019 ile 22 Haziran 2019 tarihleri arasında İzmir'de bir devlet hastanesinin tüp bebek merkezine başvuran 146 infertil kadın oluşturmaktadır. Dahil edilme kriterlerini karşılayan ve araştırmaya katılmak istediğini beyan eden 104 infertil kadından 51'i müdahale grubunu, 53'ü kontrol grubunu oluşturdu. Girişim grubuna Değişim Aşamaları Modeline dayalı bireysel psikolojik danışma programı uygulanırken, kontrol grubu rutin olarak takip edildi. Araştırma verileri SPSS 22.0 programı kullanılarak analiz edilmiştir.

Bulgular: Girişim grubu infertil kadınların ön izleme göre son izlem antropometrik değerlerinde azalma göstermiş, istatistiksel olarak anlamlı fark saptanmıştır (p=0.000). Çalışmada girişim grubu infertil kadınların ön izleme kıyasla son izlemde günlük süt grubu, sebze ve meyve grubu tüketiminde artış olmuş, et grubu, şeker grubu, yağ grubu, tahıl grubu ve ekmek grubu tüketiminde ve günlük kalori azalma olmuş, istatistiksel olarak anlamlı fark saptanmıştır (p=0.000).

Sonuç: Kilo yönetimine ilişkin Değişim Aşamaları Modeline dayalı verilen bireysel danışmanlık girişimi infertil kadınlarda fiziksel aktivite ve beslenme alışkanlıklarında sağlıklı davranış değişimine neden olmuştur.

Anahtar Kelimeler: İnfertilite, Kadın, Danışmanlık, Hemşire, Kilo Yönetimi.

ABSTRACT

Objective: Evaluate the effect of individual counseling intervention on weight management based on Stages of Change Model conducted on infertile women

Methods: This study consisted of two stages: counseling and follow-up. The research population consisted of 146 infertile women who applied to the in vitro fertilization center of a state hospital in İzmir between January 4, 2019, and June 22, 2019. Among the 104 infertile women who met the inclusion criteria and declared their willingness to participate in the study, 51 women constituted the intervention group, and 53 women constituted the control group. While an individual counseling program based on Stages of Change Model was conducted on the initiative group, the control group was followed routinely. Research data were analyzed using SPSS 22.0 software.

Results: Most recent follow-up anthropometric values of infertile women in the intervention group were lower compared to the pre-follow-up values. The difference between these two data was statistically significant (p = 0.000). Infertile women in the intervention group tended to increase their consumption of daily milk and dairy products and vegetable and fruits in their most recent follow-up stage compared to that in the pre-follow-up stage, whereas their consumption of and daily calories from meat products, sugary products, fats, cereals, and bread decreased. The difference between these two data was statistically significant (p = 0.000).

Sorumlu Yazar: Çiler YEYĞEL
Izmır Tınaztepe University, Midwifery Department, Izmır, Turkey
ciler.yeygel@tinaztepe.edu.tr
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Conclusion: Individual counseling intervention based on Stages of Change Model aiming to evaluate the weight management caused infertile women to adopt healthy behaviors in terms of physical activity and nutritional habits.

Key words: : Infertility, Women, Counseling, Nurse, Weight management.

1. INTRODUCTION

Infertility is a health problem that physically, psychologically, and emotionally, as well as socially and financially, affects couples who desire to have a baby (1). It is reported that the infertility rates are changing from country to country and infertility affects more than 80 million individuals; moreover, the incidence of infertility varies between 5% and 30% (2). The reasons for the increase in the incidence of infertility are planned pregnancy at an older age, more frequent exposure to environmental toxins, obesity and malnutrition, increase in the incidence of sexually transmitted diseases, and increased stress due to these reasons. However, most of these factors may be improved with good care and counseling (3-5).

A study on obesity conducted using data from women receiving assisted reproductive techniques (ARTs) revealed that obese women had a lower chance of conceiving, increased risk of miscarriage, and lower chance of live birth (6). Pursuant to the National Survey on Family Growth data by Vahratian et al. (2002), obese women constitute a higher percentage of patients seeking medical treatment to conceive compared to women of normal weight (7). It is noteworthy that obese women continue to have infertility problems, even if they do not have ovulatory dysfunction. Gesink et al. (2007), in their cohort study conducted on more than 7000 obese women, concluded that the probability of spontaneous conception for women with body mass index (BMI) >29 kg/m2 decreased linearly (8). It has been reported in another study that the risk of infertility increases in women with BMI >27 kg/m² or <17 kg/m² (9). Studies indicate that negative results of in vitro fertilization (IVF) treatment for overweight and obese women are mostly associated with lower pre-implantation rate and lower oocyte quality. Therefore, these women are recommended to lose weight to improve their fertility functions (10-15).

Nurses who provide health counseling to the society in addition to patients assume significant roles and responsibilities within the context of infertility counseling interventions. To sufficiently familiarize the patients, it is compulsory to determine the life behaviors of the patients by collecting sufficient information about them, provide individual training, and inform patients with unhealthy life behaviors (16). With a professional approach based on models and theories, nurses ensure that care services provided are holistic and systematic (Transtheoretical Model (TTM)) (17). One of these models, namely the TTM, is a model that has a great impact on healthy behavior change, which is widely used in the international arena and focuses on voluntary behavior change over individual decisions. This model refers to helping people develop deliberate behavior change and understanding the behavior change process (18,19). Stages of Change Model reveals “individual’s problem interaction patterns and problem solving strategies, consisting of stages of change, change processes, decision-making balance and self-efficacy” (20).

The purpose of using this model in the study is to evaluate the effect of individual counseling intervention on weight management based on Stages of Change Model conducted on infertile women. Thus, infertile women will be encouraged to change and maintain their behavior by raising awareness. For the planning of interventions, it is compulsory for health

professionals to know that lifestyle behaviors such as unhealthy nutrition and inadequate physical activity are among the risk factors affecting infertility and have negative effects on women's fertility. The main focus of this study is to develop nursing approaches and conduct motivational counseling interviews within the framework of the Stages of Change Model, aiming to change the attitudes and behaviors of infertile women and support them in this regard.

This study aimed to evaluate the effect of individual counseling intervention on weight management based on Stages of Change Model conducted on infertile women.

2. MATERIALS AND METHODS

Study Design and Participants

This study, which aimed to evaluate the effect of individual counseling intervention on weight management based on Stages of Change Model conducted on infertile women, has a pre-test-post-test, control group, quasi-experimental design.

The study was conducted between January 4, 2019, and June 22, 2019, in the ART Center (IVF) of a hospital located in İzmir. This center, which has been operating since 2009, has three gynecologists, five embryologists, two biologists, and eight nurses. Approximately 100 IVF applications are performed monthly in the center.

The sample of the study consisted of 146 infertile women who applied to the ART Center (IVF) between January 4, 2019, and June 22, 2019, and complied with the limitations of the study. To determine the number of people to participate in the research, power analysis was performed in the G power 3.1 program. In order to perform the power analysis, data from a study examining the effect of body mass index on infertility between two groups, based on a study on this subject, were used. In our study, the sample size for 95% power and 5% Type I error was determined as at least 30 women in both groups (21). Infertile women (n = 121) who volunteered to participate in the study were divided into the intervention and control groups using the simple random sampling method. Then, 10 women from the intervention group and seven women from the control group who conceived during the counseling and follow-up stages or who could not be reached were excluded from the study. The study was completed with 104 infertile women: 51 in the intervention group and 53 in the control group.

Data Collection

Face-to-face and telephone interview techniques were used simultaneously with the counseling and follow-up stages in the data collection process of the study. Infertile women were applied and required to fill in the Introductory Information Form, Nutritional Habits, Daily Food Consumption and Self-Monitoring Form, International Physical Activity Questionnaire-Short Form, Behavioral Stages of Change Identification Form, and Physical Activity Self-Monitoring Form. Preliminary interviews were conducted on 10 infertile women who were excluded from the study to determine the comprehensibility of these forms before initiating the study.

A comfortable and calm environment where women can easily express their feelings and thoughts was established in the meeting room of the clinic for the counseling and follow-up stages of the study. Behaviors of infertile women in terms of nutrition and physical activity characteristics were evaluated, and their stage of change was defined in accordance with the

Stages of Change Model. Infertile women in the intervention group were provided individual counseling using motivational interview techniques appropriate to their stage of behavioral change determined throughout the interview. There was no intervention for the women in the control group, and they only received routine clinical care.

Infertile women in the intervention group were periodically followed for a total of six times. The trainings provided were followed in the follow-up stages: The first, third, fourth, and sixth follow-ups as well as the 2nd follow-up (15 days after the first follow-up) were conducted face to face once a month, and the fifth follow-up (75 days after the first follow-up) was conducted through a phone interview (22,23). The first follow-up of the infertile women in the control group was conducted face to face, and all subsequent follow-ups were performed via phone interview.

Statistical Analysis

Research data were analyzed using Statistical Package for Social Sciences (SPSS) 22.0 software. The conformity of the data to the normal distribution was analyzed using the Shapiro–Wilk test. Whether the data were normally distributed across the groups was analyzed using the Kolmogorov–Smirnov test. Frequency, percentage, mean, standard deviation, and median were used as descriptive statistical methods. The Mann–Whitney U test was used for intergroup comparisons of quantitative follow-up data that did not show normal distribution, whereas the Friedman test and Wilcoxon signed rank test were used for in-group comparisons of quantitative follow-up data that did not show normal distribution. It was evaluated that the results were within 95% confidence interval, and the significance level was set at a p-value <0.05.

3. RESULTS

A homogeneous distribution was achieved among the groups based on age, mean income, educational status, employment status, occupational groups, and place of residence.

In the review of the pre-follow-up (first follow-up) results of the anthropometric characteristics of the infertile women included in the intervention and control groups of the study, it has been observed that the mean weight was 73.50 ± 6.414 kg, mean BMI was 28.03 ± 1.90 kg/m2, mean waist circumference was 84.24 ± 3.451 cm, and mean hip circumference was 108.29 ± 3.818 cm. In a review of the distribution of infertile women in terms of BMI, it was found that 9.6% of women had normal weight, 69.2% were overweight, and 21.2% were obese. There was no statistically significant difference between the pre-follow-up and mid-study follow-up anthropometric measurements of infertile women in the intervention and control groups ($p > 0.05$). In the review of the anthropometric measurements of the infertile women in both groups in the most recent follow-up on the 90th day, a statistically significant difference was found between the mean weight, mean BMI, and mean hip measurements ($p < 0.05$). However, no statistically significant difference in mean waist circumference measurements was determined ($p > 0.05$). In the review of the distribution of infertile women in accordance with BMI classification, a statistically significant difference was determined between the most recent follow-up BMIs of the intervention and control groups ($p = 0.000$) (Table 1).

Table 1. Intervention and control group comparison of anthropometric measurements of infertile women between follow-ups.

Measurements	**Anthropometric characteristics**	**Intervention group (n = 51)**		**Control group (n = 53)**		**Total (n = 104)**		**Test**	
		X ± SD		**X ± SD**		**X ± SD**		***U****	***p***
First	Weight (kg)	73.41 ± 6.558		73.58 ± 6.335		73.50 ± 6.414		1333	0.907
(front)	Length (cm)	161.45 ± 5.587		162.28 ± 4.773		161 ± 5.180		1223	0.402
follow-up	BMI (kg/m^2)	28.14 ± 1.87		27.92 ± 1.94		28.03 ± 1.90		1273	0.610
	Waist circumference (cm)	84.75 ± 3.071		83.75 ± 3.746		84.24 ± 3.451		1161	0.213
	Hip circumference (cm)	108.24 ± 3.620		108.34 ± 4.033		108.29 ± 3.818		2636	0.786
		X ± SD		X ± SD		X ± SD		*U**	*p*
Third	Weight (kg)	71.45 ± 6.625		72.81 ± 6.331		72.14 ± 6.481		1220	0.392
(mid-study)	BMI (kg/m^2)	27.38 ± 1.95		27.64 ± 1.95		27.52 ± 1.94		1245	0.491
follow-up	Waist circumference (cm)	84.00 ± 3.092		83.45 ± 3.796		83.72 ± 3.463		1257	0.539
	Hip circumference (cm)	106.94 ± 3.875		107.87 ± 4.057		107.29 ± 3.977		1145	0.177
		X ± SD		X ± SD		X ± SD		*U**	*p*
Sixth	Weight (kg)	69.20 ± 6.955		70.79 ± 6.856		70.68 ± 6.850		1010	**0.026**
(most recent)	BMI (kg/m^2)	26.53 ± 2.01		27.30 ± 1.98		26.99 ± 2.00		1044	**0.046**
follow-up	Waist circumference (cm)	84.00 ± 3.308		83.50 ± 3.523		83.09 ± 3.523		1300	0.737
	Hip circumference (cm)	105.00 ± 3.859		106.00 ± 3.895		106.33 ± 3.895		898.0	**0.003**
First	**BMI classification**	***N***	***%***	***N***	***%***	***N***	***%***	***X²****	***P***
(front)	18.5–24.9 kg/m^2	4	7.8	6	11.3	10	9.6	1257	0.451
follow-up	25–29.9 kg/m^2	35	68.6	37	69.8	72	69.2		
	30–34.9 kg/m^2	12	23.6	10	18.9	22	21.2		
Third	**BMI classification**	***N***	***%***	***N***	***%***	***N***	***%***	***X²****	***P***
(mid-study)	18.5–24.9 kg/m^2	8	15.7	6	11.3	14	13.5	1.848[a]	0.397
follow-up	25–29.9 kg/m^2	40	78.4	40	75.5	80	76.9		
	30–34.9 kg/m^2	3	5.9	7	13.2	10	9.6		
Sixth	**BMI classification**	***N***	***%***	***N***	***%***	***N***	***%***	***X²****	***P***
(most recent)	18.5–24.9 kg/m^2	20	39.2	6	11.3	26	25.0	18.036[a]	**0.000**
follow-up	25–29.9 kg/m^2	31	60.8	37	69.8	68	65.4		
	30–34.9 kg/m^2	-	-	10	18.9	10	9.6		

**Mann-Whitney U test, **Chi-squared test*

Table 2 evaluates the food groups consumed by the two groups during the pre-follow-up stage; a statistically significant difference was determined between the meat products, sugary foods, fatty foods, and pastry products with respect to the portions consumed ($p < 0.05$), whereas no statistically significant difference was determined between the dairy products, vegetables, cereals, and total daily calorie intake ($p > 0.05$).

In the review of food consumption of both groups in the most recent follow-up stage, a statistically highly significant difference was determined between the groups in terms of consumption of meat group products, vegetables and fruits, sugary foods, fatty foods, cereals, breads, and pastry products as well as total daily calorie intake ($p < 0.001$), whereas no statistically significant difference was determined in terms of the consumption of dairy products ($p > 0.05$) (Table 2).

In the review of the behavioral stages of change, no statistically significant difference between infertile women in the intervention and control groups was determined in terms of physical activity and nutritional behavior values during the pre-follow-up stage ($p > 0.05$). The behavioral stage of change of the two groups is referred to as the contemplation (median 2) stage (Table 3).

A statistically significant difference was found between the mid-study follow-up physical activity and nutritional behavior values of infertile women in both groups ($p < 0.000$). Considering the physical activity stages of change, it is observed that the physical activity stages of change of the control group is referred to as the contemplation (median 2) stage, while the stages of change of the intervention group is referred to as the action (median 4) stage. Considering the nutrition stages of change, it is observed that the nutrition stages of change of the control group is referred to as the contemplation (median 2) stage, while the stages of change of the intervention group is referred to as the action (median 4) stage (Table 3).

A statistically significant difference was found between the most recent follow-up physical activity and nutritional behavior values of infertile women in both groups ($p < 0.000$). Considering the physical activity stages of change, it is observed that the physical activity stage of change of the control group is referred to as the contemplation (median 2) stage, while the stage of change of the intervention group is referred to as the maintenance (median 5) stage. Considering the nutritional behavior stages of change, it is observed that the nutrition stages of change of the control group is referred to as the preparation (median 3) stage, while the stages of change of the intervention group is referred to as the maintenance (median 5) stage (Table 3). While infertile women in the intervention group developed their physical activity and nutritional behavior within the framework of the stages of change, no behavioral change was recorded for infertile women in the control group.

4. DISCUSSION

Throughout the study, it was determined that majority of infertile women who were provided individual counseling based on motivational interview techniques were either overweight or obese in the pre-follow-up stage. Their anthropometric properties, such as mean height, weight, BMI, waist circumference, and hip circumference, were examined, and it was concluded that there was no significant difference between the pre-follow-up and mid-study

Table 2. Comparison of MPQ Scale Scores of People with and Without COVID-19

Food portions	Group	First (front) follow-up			Sixth (most recent) follow-up		
		Test			Test		
		X ± SD	U*	p	X ± SD	U*	p
Portion of milk and dairy products	Intervention	1.78 ± 1.331			2.45 ± 1.083		
	Control	1.96 ± 1.143	1221.50	0.382	2.08 ± 1.107	1070.50	0.059
	Total	1.88 ± 1.236			2.26 ± 1.106		
Portion of meat products and derivative	Intervention	3.41 ± 1.675			3.10 ± 0.755		
	Control	2.47 ± 1.815	939.00	**0.007**	2.43 ± 1.294	875.50	**0.001**
	Total	2.93 ± 1.802			2.76 ± 1.110		
Portions of vegetables and fruits	Intervention	4.35 ± 2.890			5.33 ± 1.807		
	Control	4.13 ± 2.410	1334.50	0.911	4.15 ± 1.957	842.50	**0.001**
	Total	4.24 ± 2.646			4.73 ± 1.957		
Portion of sugary products	Intervention	4.02 ± 1.794			1.20 ± 0.960		
	Control	3.06 ± 1.975	956.50	**0.009**	2.66 ± 1.413	507.50	**0.000**
	Total	3.53 ± 1.941			1.94 ± 1.413		
Fatty food portions	Intervention	4.63 ± 2.078			1.65 ± 0.796		
	Control	3.30 ± 1.835	863.50	**0.001**	2.87 ± 1.532	671.00	**0.000**
	Total	3.95 ± 2.059			2.27 ± 1.367		
Cereals food portions	Intervention	2.88 ± 1.986			2.71 ± 0.782		
	Control	3.45 ± 2.189	1149.50	0.180	3.57 ± 1.264	791.00	**0.000**
	Total	3.17 ± 2.102			3.14 ± 1.136		
Portion of breads and pastry products	Intervention	6.24 ± 2.196			2.67 ± 0.931		
	Control	7.19 ± 1.787	1029.00	**0.033**	6.32 ± 1.554	26.00	**0.000**
	Total	6.72 ± 2.045			4.53 ± 2.238		
Daily calories	Intervention	3271.76 ± 322.508			2394.20 ± 247.083		
	Control	3231.51 ± 389.649	1256.50	0.537	2967.00 ± 413.113	324.50	**0.000**
	Total	3251.25 ± 357.142			2686.11 ± 445.631		

**Mann–Whitney U test*

Table 3. Intervention and control groups by behavioral change stage comparison of physical activity and nutrition patterns of infertile women in the front follow-up, mid-study follow-up, and most recent follow-up.

Behavior change	First (front) follow-up			Third (mid-study) follow-up			Sixth (most recent) follow-up		
	Median	U*	p	Median	U*	p	Median	U*	p
Physical activity									
Intervention	2	1282	0.633	4	315	**0.000**	5	109	**0.000**
Control	2			2			3		
Nutrition									
Intervention	2	1330	0.884	4	357	**0.000**	5	69	**0.000**
Control	2			2			3		

**Mann–Whitney U test,*

Before contemplation -1, Contemplation -2, Preparation -3, Action -4, Maintenance

follow-up stage values of the women included in the intervention and control groups, whereas a statistically significant difference was found between the intervention and control groups in terms of their mean weight, BMI, and hip circumference as of the most recent follow-up stage. Studies on weight management of overweight and obese infertile women revealed that statistically significant results were obtained in terms of the anthropometric measurements of the women who followed stages of behavioral changes (8,9,24,25). In the LIFEstyle study conducted by Karsten et al. (2019), women in the intervention group participated in a 6-month structured lifestyle intervention program aimed at losing their weight corresponding to at least 5% of their original body weight. It was determined that 119 of 289 infertile women lost 5% of their weight and their BMI decreased to <29 kg/m2 within the 6 months of the study. The mean weight loss throughout this period was 5.20 kg. During the intervention, the women reduced their energy intake, based on the total daily calories they consume, by 472 kcal (26). Obesity emerges as a risk factor for infertility. It is pleasing that interventions based on weight management in this context yield effective results.

In this study, participants in the intervention group are suggested to consume at least five portions of vegetables and fruits a day, milk daily, and whole-grain and wholemeal bread instead of white bread and avoid consuming pre-packaged, sugary foods and beverages within the framework of healthy eating behaviors for achieving weight management. Similarly, two studies conducted by Vujkovic et al. (2010) and Toledo et al. (2011) revealed that Mediterranean-style diet, compared to Western-style diet, increases fertility success in infertile women by providing weight control; thus, it is recommended to consume foods containing fiber-rich vegetables and fruits, milk daily, and whole-grain foods and olive oil (27,28).

Infertile women in the intervention group of the study tended to increase their consumption of daily milk and dairy products as well as vegetable and fruits in their most recent follow-up stage, whereas their consumption of meat products, sugary products, fats, cereals, and bread decreased. The difference between these two data was statistically significant. There was also a decrease in the amount of daily calorie intake of these individuals, and a statistically significant difference was determined in this regard. Individual counseling initiative provided

to infertile women for weight management within the scope of this study is determined to improve the nutritional habits of infertile women in a healthy way. In the pre-follow-up stage, the nutritional style of infertile women, food portions they consume daily, and the way they cook their food were surveyed, and they were recommended to update their current eating habits with healthier eating suggestions tailored for the individual. They were further suggested to consume milk daily; consume at least five servings of fresh vegetables and fruits with high fiber content, cereal foods, rye and whole wheat bread instead of white bread, fish and foods containing olive oil rich in omega-3, omega-6, and omega-9 instead of trans fats found in margarine and frying oil; and avoid consuming pre-packaged and sugary foods and fast food. Owing to these principles, the nutrition program aimed at increasing fertility success in infertile women through weight management is found to be similar to the literature (27-31).

Within the scope of the study conducted by Twigt et al. (2012), the "Dietary Risk Score" of the diet containing vegetables, fruits, meat, fish, oils, and whole wheat products recommended to 199 women undergoing infertility treatment was calculated, and its effect on conception success was evaluated. As a result, it was determined that one-point increase in the diet risk score increased the chances of continued conception by 65% (32). The nutritional recommendations provided for infertile women within the scope of the study to ensure weight control are found to be similar to this study.

The Stages of Change Model referred to in this study defines the stage of change at which the person is according to the Stages of Change Model before causing a behavioral change in infertile women. The pre-contemplation (1), contemplation (2), preparation (3), action (4), and maintenance (5) stages of the Stages of Change Model not only develop the behavior of the person over the period that occurs in a certain process but also motivates the person as he/she skips the stages (33,34). Individual counseling intervention provided to infertile women in the intervention group through motivational interview techniques in the study enabled them to develop behavioral changes in terms of nutritional and physical activity using the Stages of Change Model. The fact that the intervention performed based on motivational interview techniques in the intervention group resulted in changes in nutritional and physical activity behaviors positively affected the weight loss of women.

In a similar randomized-controlled trial, namely "LIFEstyle research" conducted by Karsten et al. (2019), which evaluated the determinants of lifestyle changes among women with obesity and infertility and compared the effects of lifestyle interventions on 289 women over a 6-month period, the demographic, physical, behavioral, and psychological determinants of women were identified using the TTM (also called the Stages of Change Model), and in this context, women were provided a change in behavior regarding nutrition, physical activity, and harmful habits by conducting motivational interviews. A total of 226 (78%) women completed the lifestyle intervention process, whereas 63 women left the program. Lack of motivation (n = 40), relationship problems with spouses (n = 12), and other factors (n = 11) were determined as the reasons for terminating the intervention. The change toward increasing physical activity was significantly associated with the increasing number of daily steps. It was found that women who were in the action stage were more likely to increase the number of their steps as physical activity compared to women who were in the maintenance stage. It also increased the likelihood of completing the lifestyle intervention during the action stage toward weight loss (26). The

results of the study suggesting that motivational preparation has a positive effect on increasing physical activity are similar.

5. CONCLUSION

The results obtained in the study, with a general evaluation, aim to offer suggestions and guide the future studies in this field. This study evaluated the effect of individual counseling services provided in terms of physical activity and dietary habits on the weight management of infertile women with the Stages of Change Model, and in this context, women in the intervention group were found to exhibit positive behavioral changes in terms of nutrition and physical activity.

- As a result of the study, fertility nurses are recommended to consider motivational counseling while performing their counseling role, particularly regarding lifestyle changes, and organize their intervention programs according to the stages of change of the individual.
- Finally, it is recommended to conduct similar studies on other sample groups, including obese patients

Ethicial Considerations

Ethical approval (dated November 28, 2018, numbered 18-11.1T/29) before initiation of this study was obtained from the Scientific Research and Publication Ethics Committee of a University.

Conflict of Interest

The authors have no conflicts of interest to declare.

Limitations of the Study

Infertile women who applied for infertility treatment for the second time and had a BMI > 35 kg/m^2 were excluded from the study as they were not accepted for IVF treatment at this center.

A pedometer, which is in fact an objective measurement tool, could not be used to evaluate the physical activity levels of infertile women within the scope of the study due to financial restrictions. Instead, the physical activity levels of the individuals were evaluated through their written and verbal expressions.

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