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The Efficacy of Pre-marital Counseling Based on Motivational Interviewing on Couples' Knowledge, Attitude and Intention to obtain Genetic Counseling

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ABSTRACT

Background & aim: Knowledge of and attitude toward genetic diseases are poor, and few at-risk couples seek genetic counseling. The current research was conducted to determine the efficacy of premarital counseling based on motivational interviewing on couples' knowledge, attitude, and intention to obtain genetic counseling.

Methods: This randomized clinical trial was performed on 69 eligible couples who attended the health centers of Mashhad, Iran, between May and July 2023 . The subjects were randomly assigned to two groups of intervention and control. The intervention group received premarital counseling based on motivational interviewing during 3 individual sessions, each lasting 60–90 minutes, with one week interval. Both groups, in addition to receiving usual care, completed Knowledge questionnaire, modified attitude of Zaien questionnaire , and genetic counseling intention questionnaire before and two weeks post-counseling . Data were analyzed using SPSS software including Chi-square, independent t, and Mann-Whitney tests.

Results: The changes in the mean score of pre and post intervention knowledge in the intervention and control group were 10.25±9.13 and 3.61±6.28, respectively, which shows a significant difference between the two groups (P<0.05). Also, the mean attitude score after the intervention was significantly higher in the intervention group compared to the control group (P<0.001). Additionally, after the intervention, 70.6% in the intervention group and 45.7% in the control group intended to receive genetic counseling (P<0.05).

Conclusion: The motivational interviewing improve knowledge, attitude, and intention of couples to obtain genetic counseling. Therefore, this approach can be used for genetic counseling in pre-marriage counseling classes.

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Introduction

Genetic disorders are the second cause of death in infancy and childhood in developed countries, with a prevalence of 25-60 per thousand live births. Also, they are a serious threat to disability or death in neonates and children (1). At least 6-7 million children are born with severe genetic or congenital abnormalities annually, of which 90% are in low- and middle-income countries. Each woman has a risk of giving birth to a baby with genetic diseases

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(2). The incidence of congenital abnormalities is different in each city of Iran. It was reported as 0.82% in Ardabil (3), 1.16% in Golestan province (4), and 5.38 per thousand live births in Rafsanjan in 2018 (5). Many cases of mental retardation, genetic abnormalities, and hereditary diseases are predictable. It is possible to prevent the birth of a considerable number of children with these diseases by considering the laws of inheritance, genetic counseling, and performing various tests before marriage (6).

In societies where consanguineous marriages are common, autosomal recessive genetic disorders with increased homozygosity can affect some factors of fertility and growth, repeated miscarriages, congenital disorders such as heart disease, mental retardation, and deafness (7). Due to the high rate of consanguineous marriages in Islamic countries, the incidence of congenital disorders in these countries is 10% to 45% (8).

Premarital counseling is one of the most important ways to prevent genetic disorders, congenital abnormalities, and several medical, psychological, and social disorders. Genetic counseling is done to guide and inform couples about the status of genetic diseases in the family and the risk of genetic disease in their children. Correct and timely genetic counseling allows couples to make the right decision to get pregnant or continue a pregnancy (9).

Researches confirm that the cause of genetic diseases is not properly explained in the opinion of couples, that by informing couples and changing their attitudes, it is possible to prevent physical and mental problems and disabilities by observing health principles (10). Mahmoudabadi et al. (2019) emphasized the weak knowledge and information of couples in the field of genetic diseases. They also showed that by the educational intervention, it is possible to increase the mean scores of awareness and attitudes of couples regarding genetic diseases after the educational intervention (10).

Pasca et al. (2022), in a qualitative study on the knowledge and perception of American adults about the profession of genetic counselors, reported that lack of knowledge and perceived benefits, lack of trust in genetic counselors, or more trust in other health care providers were cited as the reasons for people not to have the desire to make an appointment and visit genetic counselors. They found a significant relationship between the knowledge of the benefits of genetic counseling and the search for these services (11). Moodi et al. (2016) conducted a randomized clinical trial on 80 married women in Birjand, South Iran and showed that the implementation of the educational intervention of genetic counseling based on the health belief model is effective in the prevention of congenital abnormalities and it can increase the awareness, belief and self-efficacy of women in the intervention group compared to the control group during three months (12). Driver et al. (2023) conducted a randomized controlled clinical trial who provided online information about alcohol use disorder to the intervention group. They reported that this model did not affect the awareness, motivation, and intention of the intervention group compared to the control group (13).

Nowadays, counseling is reported to be one of the effective ways to enhance clients' awareness and attitude, which can also be one of the proposed options for changing negative health behaviors (14). Motivational interviewing is one of the counseling approaches (15), which helps clients to find the causes of doubt by focusing on the reasons for the change after gaining sufficient knowledge about the advantages and disadvantages of the change with the help and support of the Consultant (16-17). Motivational interviewing was proposed for the first time for the treatment of addiction, and due to its positive consequences, it quickly spread to all health promotion systems (18). There are four principles of motivational interviewing including empathy, increasing conflict, tolerance of resistance, and supporting self-efficacy (19). The empathetic and client-centered approach includes reflective listening and acceptance of the client's feelings and perspectives. The increase in conflicts can lead to the understanding of clients' motivations (20-21). This motivation does not come from the counsellor; rather, it comes from within the clients, arising when they identify how their behavior affects their personal goals (22-23).

In motivational interviewing, the client's motivation and commitment is an important issue that forms the basis of treatment results,

because if the client is not ready to accept, even the strongest counselling approach will not be effective. Therefore, it is necessary to use a structured, flexible, and step-by-step approach, such as a motivational interviewing that can be adapted to the client's preferences (24). Since no study was found on the effectiveness of motivational interviewing in genetic counseling and premarital counseling programs about improving the awareness and attitude of couples, therefore, the current research aimed to determine the efficacy of pre-marital counseling based on motivational interviewing on couples' knowledge, attitude and intention to obtain genetic counseling.

Materials and Methods

This parallel randomized clinical trial was conducted in Mashhad health centers between May 2023 and July 2023. was registered in the Iranian Registry of Clinical Trials (IRCT20221022056264N1). According to ethical considerations, the objectives of the study were explained to the participants, and informed consent was obtained.

The participants were selected by the Convenience sampling method from the statistical population of couples who referred to the health centers in Mashhad to participate in pre-marital classes. Then, participants were randomly divided into intervention and control groups. People who were in the intervention group received group counseling based on motivational interviews, and the control group received routine care.

Among the five health centers in Mashhad, only two health centers provide premarital counseling services for a large number of pre-marital couples referred to participate in pre-marriage classes and the coverage of areas with different social and economic levels.

To calculate the sample size, the results of the pilot study of 10 participants in each group for knowledgeas well as the results of studies by Shojaei Far et al. (2021) (25) and Haji Hosseini (2020) (26) for attitude were used. To determine the sample size of the frequency of referral, the results of the pilot study was used and it has been done on 10 people in each group and according to the mean comparison formula, the confidence level of 95% and the power of 80, finally, the sample size of 33 couples was calculated for each group, and according to the loss of about 10%, a total number of 34 couples was considered for each group.

The inclusion criteria were: being Iranian and living in Mashhad, having at least an elementary education, having an Android phone, not being addicted to tobacco or alcohol, recognizing the need for genetic counseling during premarital counseling classes for couples, and not intending to do genetic counseling. Unwillingness to participate in the research, not participating in a counseling session, the occurrence of unfortunate events in the last three months, and receiving information from other sources in the field of genetic counseling were considered as the exclusion criteria.

The research tools included a checklist for the selection of the research unit, a 29-questions personal and family characteristic questionnaire [The first question was whether their marriage was consanguineous. And there were questions about the woman and her husband, including age, occupation, level of education, income, insurance, smoking, alcohol consumption, history of hereditary diseases (thalassemia, phenylketonuria, Down syndrome, galactosemia, hemophilia), mental retardation, movement disorders or congenital deafness and blindness and neural tube defects in the family, the presence of illness or the need to take medication permanently] researcher-made questionnaire based on the guidelines of the social genetics program of the Iranian Ministry of Health (27), the modified attitude questionnaire of Zaien (28), It should be noted that question 9 of the Zain questionnaire regarding agreement with mandatory premarital genetic counseling was changed to agreement with performing this screening for needy couples according to the Iranian Genetic Counseling Program and a researcher-made questionnaire on the intention to obtain genetic counseling. The knowledge questionnaire about genetic counseling included 31 three-choice questions, with a score of 1 for a correct answer and a score of 0 for a wrong answer, and I do not know, and the total score was obtained from 0 to 31. Zaien's genetic counseling attitude questionnaire has ten items that are scored on a 5-point Likert scale, which is rated from completely disagree (1) to completely

agree (5). The range of scores is between 10 and 50. Higher scores in the knowledge and attitude questionnaires were associated with higher knowledge and attitude. The questionnaire about the intention to refer for genetic counseling consists of a three-choice question (I definitely do genetic counseling, I probably do genetic counseling, I haven't decided), which is used to record the couple's intention to do genetic counseling.

The validity of the knowledge questionnaire and the questionnaire of the intention to obtain genetic counseling were evaluated by the qualitative content validity method through seven faculty members of the Faculty of Nursing and Midwifery. The validity of the modified attitude questionnaire of Zaien (2022)was confirmed through the content validity index, CVR=0.9, and CVI=0.9.The internal consistency of the knowledge and attitude questionnaires was assessed using Cronbach's alpha, yielding high reliability coefficients of 0.85 and 0.83, respectively, in a sample of 20 participants. The intention questionnaire demonstrated strong inter-rater reliability, with a Cronbach's alpha of 0.81.

The qualification of the first author to conduct a motivational interview was confirmed by her certificate of participation in an online workshop(60-90 minutes) and conducting the counseling procedure in the presence of a psychiatrist.

To collect data, after entering each selected center, the researcher introduced herself, presented the permission, explained the research objectives and methods of the study to the center's director, and, in coordination with the relevant officials, she went to the pre-marriage counseling room. According to the routin of center, a part of premarital counseling classes is usually dedicated to genetic counseling, and the health care provider or midwife of the center explains for 35 minutes about genetic counseling and 6 common diseases (Down's syndrome, Duchenne, thalassemia major, cycle tuberculosis, hemophilia, hereditary metabolic diseases, phenylketonuria, and galactosemia).

At the end of the session, the couples answered the genetic screening questionnaire, they were asked about genetic diseases and disorders in themselves and their families and relatives. If there was a positive answer in the questionnaire and the genetic physician confirms that, the couple was recognized as needing genetic counseling. Then, the researcher invited the couples who, despite the diagnosis of the need for genetic counseling, did not intend to go to the counseling centers and met other entry criteria, to participate in the research. If they agreed and obtained informed consent, they were asked to complete the questionnaire on knowledge, attitude, and intention to obtain genetic counseling. Before completing the questionnaires, the researcher also explained how to complete the questionnaires correctly. Then, the couples were assigned to one of the intervention and control groups using a random sequence generated by the website (www.randomization.com) based on quadruple replacement blocks. The sequence of placement of participants in the control and intervention groups was written on small cards and placed in closed envelopes to keep them confidential. In this way, the couples were classified into groups A (control group) and B (intervention group) on the same day based on the table and envelopes. It was continued until the number of participants in each group was completed according to the sample size specified. Motivational counseling requires initial training for couples and homework, so it was not possible to blind this study. Finally, the data of 69 couples were included in the analysis out of 84 couples who were randomized (Figure 1).

Both intervention and control groups received the routine care of the health center. In the intervention group, in addition to routine care, three group counseling sessions (4-5 couples in each group) were held based on motivational interviews (60-90 minutes) once a week in the form of one face-to-face session and two online sessions in the a national messenger called Eitaa Messenger. The number of sessions was determined according to the counseling stages and similar studies. The content of these sessions was defined based on the motivational interview approach. The four principles of this technique including empathy, increasing conflict, tolerance of resistance, and supporting self-efficacy, were applied in the program (26, 29).

In the first session, after the introduction and initial communication, the change initiation was

discussed. The couples were encouraged to express their feelings about genetic disorders and counseling. Also, active listening and empathy were used in the session by the researcher. In the second session, couples' doubts and questions were heard and answered. Listening to couples' dialog about changing their behaviors, motivations, feelings, and values could lead to clarifying the reasons to change them. In case of resistance, the counselor changed the approach and looked for the client's problems and obstacles. The third session consisted of supporting the participants' self-efficacy in the field of change by using empowerment. At the end of the counseling sessions, two weeks later,All three questionnaires (knowledge, attitude, and intention to obtain genetic counseling) were completed by participants face to face. The average time to complete all three questionnaires was 20-25 minutes. The participants were appreciated, and gifts were given to them for compensation.

Data were analyzed by SPSS software (version 25). At first, the normality of the quantitative variables was examined by Kolmogorov-Smirnov test. In the case of normal distribution, a paired t-test was used to compare the quantitative variables before and after the intervention in each group, and if the quantitative variables were not normal, the non-parametric equivalent t-pair test (Wilcoxon signed rank) was used.

Table 1. The content of the counselling sessions

Sessions	Content	Target	Homework
The first session (face-to-face)	-Greetings, introduction - Emphasis on information confidentiality -Express the couple's feelings towards genetic counseling - Expressing the effects of having a child suffering from genetic disorders in different aspects of life Introduction of the motivational approach	Conversation initiation for change	Open-ended questions Open-ended questions (what do you know about genetic diseases and disorders? What do you know about genetic counseling(? Express beliefs and information
The second session (online) in Eitaa Messenger	- Provide information to increase couples' awareness in the field of genetic counseling and genetic disorders - Answers to the questions and doubts in the couple's minds - Help the person to feel the inner necessity for change, awareness of change, and stimulating change-oriented conversation - Investigate existing problems, obstacles, and the causes of resistance The next online session has been determined.	Express the reasons for the change	Talk about the reasons for the change -What do you like? -How can you go to genetic counseling centers? -Why do you want to go to genetic counseling sessions? - How important is genetic counseling to you, and how often do you think that you need it?
Third session (online) in Eitaa Messenger	- Emphasis on the ability of the person to change - Investigate group opinions on the advantages and disadvantages of Continuation of behavior and conclusions	Practical exercises for change	-Express the positive and negative points of genetic counseling -Boiling and intellectual precipitation -Use a ruler or evaluation scale -Mental imagination

To compare the mean of the quantitative variable in two independent groups, assuming that the quantitative variable is normal in both groups, the independent t-test was used, and if the quantitative variable was not normal, the non-parametric test equivalent to the independent t (Mann-Whitney test) was applied. Two-way ANOVA was employed to determine the effect of confounding variables on dependent variables in the two groups. P<0.05 was considered statistically significant (Table 1).

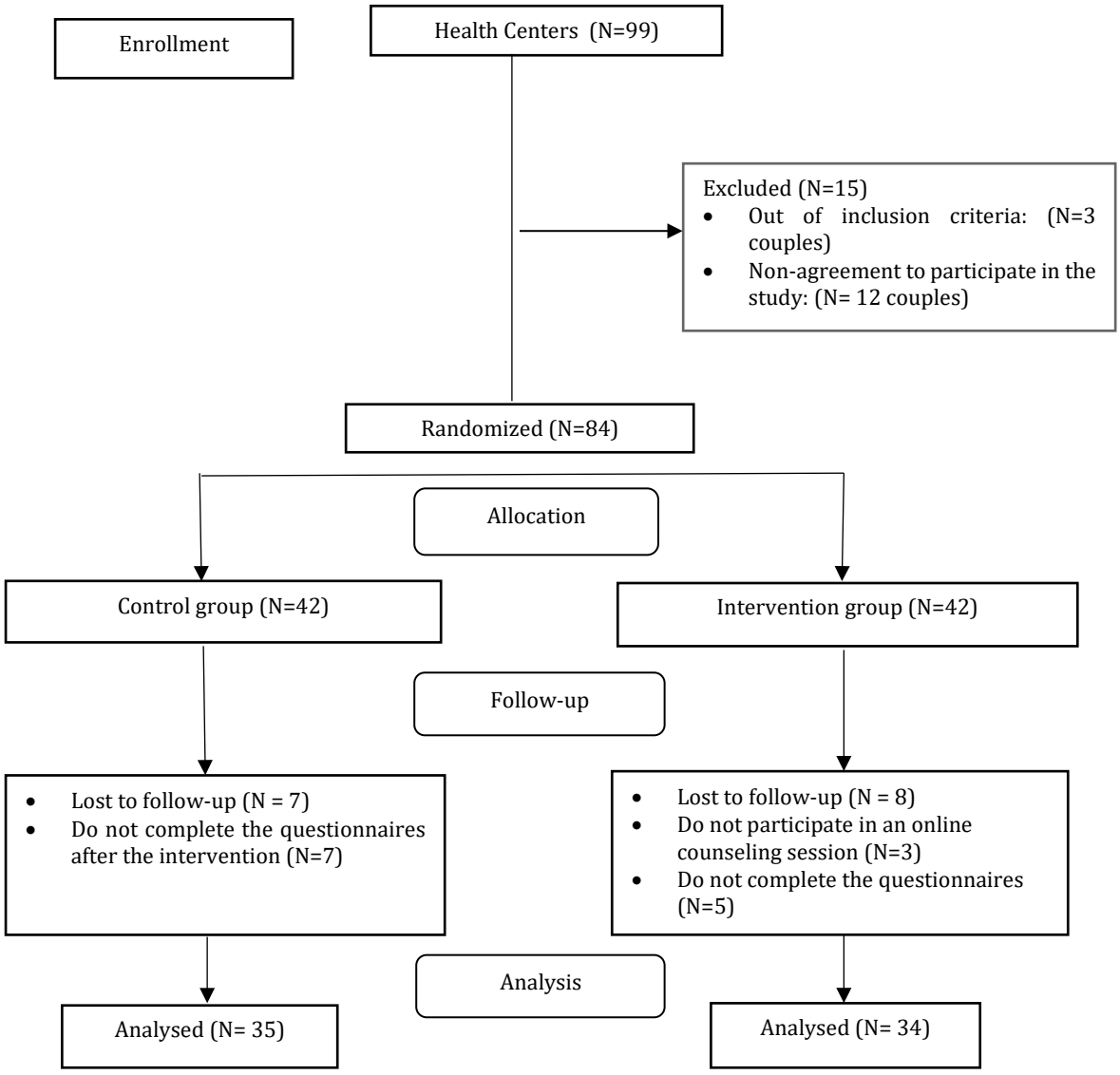

Figure 1. CONSORT Flowchart of the study

Results

The mean age in the intervention group was 24.85 ± 6.8 years, and in the control group was 22.91 ± 6.11 years. In the intervention group, there were 44 employed men (64.7%), and in the control group, 34 employed men (48.6%), who were homogeneous. The two groups were not homogeneous in terms of husbands' occupation, income, and education level, so the effect was eliminated with the statistical test of covariance. Some family histories were reported in Table 2.

Table 2. Characteristics of the participants in this study

Variable	Control (N=35) N (%)	Intervention (N=34) N (%)	Total (N=69) N (%)	Test Result
Taking special medication***	1 (1.4)	2 (2.9)		χ2=0.371
Smoking or alcohol consumption	15 (21.4)	15 (22.1)	3 (2.2)	P*=0.542
History of physical and motor genetic disease in the family	13 (18.6)	18 (26.5)	30 (21.7)	χ2=0.008
Family history of thalassemia	3 (4.3)	2 (2.9)	31 (22.5)	P*=0.928
Family history of neural tube defects	0 (0.0)	2 (2.9)	5 (3.6)	χ2=1.67

* Chi-square test ** Fisher's test *** Nerve and psychiatric drugs, or drugs that must be taken continuously

Before the intervention, there was a statistically significant difference between the intervention group and the control group regarding the mean of general knowledge about genetic counseling (P=0.001). However, due to the heterogeneity of the overall knowledge score in the pre-intervention stage, by removing the effect of the knowledge score before the intervention, the analysis of covariance test was used, and the results showed that there was a significant difference between the two groups after the intervention regarding the knowledge score (P=0.034). After the intervention, there was a significant increase in the mean score of couples' knowledge in the intervention group compared to the control group (P<0.001) (Table 3).

Table 3. Mean of knowledge score of premarital couples referring to health centers in the control and intervention groups

Variable	Control (N=35)		Intervention (N= 34)		Test Results
	Middle (Interquartile range)	(Mean±SD)	Middle (Interquartile range)	(Mean±SD)	
General knowledge of genetic counseling before intervention	10.0 (11.2)	12.20±7.45	17.0 (14.0)	16.80±9.01	*Z=- 3.28 P=0.001
General knowledge of genetic counseling after intervention	15.5 (15.3)	15.81±8.39	29.0 (4.0)	27.05±5.29	*Z= - 7.87 P<0.001
Differences in general knowledge of genetic counseling	2.0 (7.0)	3.61±6.28	10.0 (15.0)	10.25±9.13	*Z= - 4.69 P<0.001
	***Z= - 4.60 P<0.001		**Z= - 6.46 P<0.001		

* Mann-Whitney test ** Paired T-test

The attitude score towards genetic counseling was heterogeneous in the pre-intervention stage. For this purpose, an analysis of the covariance test was used, which, after removing the effect of the attitude score towards genetic counseling before the intervention, showed a significant difference in the attitude score towards genetic counseling after the intervention in both groups (P=0.014) (Table 4).

Also, before the intervention, 79.4% of the participants in the intervention group and 76.8% in the control group did not decide to do genetic counseling. However, after the intervention, the frequency of the definite intention to obtain genetic counseling was 70.6% in the intervention group and 45.7% in the control group, which showed a statistically significant difference between the two groups (P<0.001) (Table5).

Table 4. Mean of attitude score of premarital couples referring to health centers in the control and intervention groups

Variable	Control (N=35)		Intervention (N= 34)		Test Results
	Middle (Interquartile range)	(Mean±SD)	Middle (Interquartile range)	(Mean±SD)	
Attitudes toward pre-intervention genetic counseling	38.00 (9.25)	36.65±7.25	42.50 (12.00)	42.47±6.56	*Z= - 4.30 P<0.001
Attitude toward genetic counseling after the intervention	38.50 (6.25)	37.55±6.87	45.00 (8.75)	44.05±5.61	*Z= - 5.80 P<0.001
Differences in attitudes toward genetic counseling	00.00 (3.00)	0.90±5.33	0.50 (5.75)	1.58±5.36	*Z= - 0.73 P=0.46
	***Z= - 1.98 P=0.04		**Z= - 2.89 P=0.004		

* Mann-Whitney test ** Paired T-test *** Wilcoxon signed the rank test

Table 5. Comparison of two groups regarding intention to genetic counseling

Variable	Intervention (N=34)	Control (N=35)	Total (N=69)	Test Results
	N (%)	N (%)	N (%)	
genetic counseling before intervention				
Probably	7(20.60)	8(23.2)	30(21.9)	χ^2 =2.136 p=0.344
No decision.	27(79.4)	27(76.8)	54(78.1)	
genetic counseling after intervention				
Definitely	24(70.6)	16(45.7)	40(58)	
Probably	10(27.4)	14(40.00)	24(34)	P<0.001
No decision	0(0.00)	10(14.30)	5(8)	

Discussion

The purpose of the current research was to determine the efficacy of premarital counseling based on motivational interviewing on the knowledge, attitude, and intention of couples who need genetic counseling. The results showed that motivational interviewing increases the knowledge of couples in the intervention group than the control group, which only receives routine education. Although the knowledge of the couples before the study was not homogeneous, the level of knowledge in the intervention group was higher, the changes in the level of knowledge in the intervention group compared to the control group were calculated statistically significant. Due to the lack of homogeneity of the two groups before the intervention, analysis of covariance was used to eliminate the effect of the pre-test.

The results of the present study were consistent with the results of some other studies (26,29-32). Haji Hosseini et al. (2020) in their study conducted three counseling sessions based on motivational interviews on 60 pregnant women with 28-30 weeks of gestational age who were referred to the comprehensive health service center No. 3 in Mashhad. They concluded that motivational interview increases the awareness of pregnant women regarding natural delivery after cesarean section compared to the control group (26). Their results are consistent with the results of our study due to the incremental changes, but the changes in awareness in the present study are stronger than in the mentioned study (10 points vs. 2.5 points). One of the causes of this difference can be due to the difference in the subject matter and the difference in the commitment and motivation created by the participants. Therefore, using a structured, flexible, and step-by-step approach, such as a motivational interview that can be adapted to the patient's preferences, can be

effective in persuading couples to perform genetic counseling.

In the study of Moodi et al. (2013), only one 50-minute training session was conducted in the pre-marriage class (20-30 people). The results indicated an increase of 50% in the knowledge scores of intervention group couples about genetic counseling after the implementation of the training (29). It is worth noting that the level of awareness of couples about genetic counseling is low, which has been reported in many domestic and foreign studies in line with the present study. Some studies also reported similar results (11,30-33).

Hamed et al. (2022) in their study on 360 couples in Egypt reported that two-thirds of the couples who participated in the study had very low knowledge about premarital counseling and genetic counseling. So, they have recommended that there is a need to increase society's knowledge about premarital screening and genetic counseling with cooperation and religious support, and adopting government policies (31). Also, the results of this research showed that motivational interviews improved the attitude of couples who need genetic counseling in the intervention group after the implementation of counseling, compared to the control group, which only received routine care through the lecture method. Attitude changes were reported at 3.7% in the intervention group and 2.4% in the control group, that was not significant. Due to the lack of homogeneity in the two groups before the intervention, an analysis of covariance was used to eliminate the effect of the pre-test.

The results of the study by Shujaei Far et al. (2021), which was conducted in Arak on 30 couples (15 couples in each group) who were not inclined to receive genetic counseling, showed that conducting 5 sessions of motivational interview increased the attitude of couples towards premarital genetic experiments. So that after the implementation of this consultation, the attitude changes in the intervention group were significantly more than in the control group (25), which is not consistent with the results of the present study. Changing the attitude is a time-consuming process, and it is not easily done. It should be noticed that attitude is a complex process that is affected by many factors, including individual and social interactions. The interpersonal context gives dialogue partners a lot of opportunity to influence each other intentionally or unintentionally; also the feeling of security affects the way people think, understand their social world, and process information related to attitude (34). Therefore, due to the gradual nature of changes in attitude and its being derived from the environment, observing immediate and significant changes in attitude is a relatively high expectation (33).

Another result of the present study was a significant increase in the intention to refer to genetic counseling centers. After the intervention, the definite intention to perform genetic counseling was 70.6% in the intervention group and 45.7% in the control group, and a statistically significant difference was found between the two groups. Hosseini Haji et al. (2020) also reported an increase in women's intention to choose vaginal delivery after cesarean delivery (43.4% in the intervention group and 22.7% in the control group) after conducting a three-session motivational interview (26), which is consistent with the result of the present study. Pasca et al. (2022) in a qualitative study on the knowledge and perception of American adults about the profession of genetic counselors reported that lack of knowledge and perceived benefits, and lack of trust in genetic counselors are the reasons which people not making an appointment and referring to genetic counselors and the genetic counseling centers. Their study established a direct relationship between the awareness of the benefits of genetic counseling and the intention to perform these services (11). Although due to the qualitative nature of Pasca's and et al. (2022), it was not possible to check the statistical relationship, the results of the qualitative part support the results of this study. Since the birth of a disabled child and the death of the fetus lead to adverse consequences, the researchers emphasize the use of effective techniques such as motivational interviewing due to the importance of genetic experiments. In addition, carrying out preventive measures such as empowering healthcare providers to increase public awareness about the problems of these families is considered to be one of the important solutions (25).

The present study was accompanied by some limitations. Individual differences, differences in clients' needs from the counseling process, lack of attention to individual beliefs due to lack of integration with individual counseling, and the effect of knowledge of health care providers and midwives on their response were among the limitations of the present study whose control was out of the researcher's responsibility. Also, among the advantages of the present study, we can mention the originality and appropriateness of motivational interviewing as a counseling technique that creates an opportunity for the presence of couples with the experience of a child with a genetic disease, and for premarital couples who need the counseling process. In this study, the general opinions of couples were examined. It is suggested that, in future studies, the effect of this type of counseling on knowledge, attitudes, and intentions to visit women and men before marriage be examined separately to determine its effectiveness by gender.

Conclusion

According to the results of this research, motivational interviewing increases knowledge, as well as increases the intention of couples to refer for genetic counseling. Therefore, this counseling technique can be used to prepare couples in terms of changing their behavior to undergo genetic counseling..

Declarations

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Conflicts of interest

The authors declared no conflicts of interest.

Ethical approval

Informed consent was obtained from the participants to take part in the study after explaining the purpose of the research and the implementation method. They were assured that theirdata will be remained confidential.

Code of Ethics

This project was approved by the Local Research Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran under ethics code of IR.MUMS.NURSE.REC.1401.070.

Use of Artificial Intelligence (AI)

AI tools and technologies are not used to prepare this manuscript.

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Authors' contribution

NJ and MI contributed in conceptualization and designing the study. MI carried out the data collection. ME and MA-K contributed in design of the study and reviewed the manuscript critically for important intellectual content. RM analysed and interpreted the data. All authors read and approved final version of the manuscript.

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