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Exploring the reproductive health needs of men in the preconception period: A qualitative study

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Abstract:

BACKGROUND: Male reproductive health is a necessary pillar of childbearing. If a reproductive health assessment is conducted in the preconception period, the chance of a healthy pregnancy can increase. This qualitative study aimed to explore men's reproductive health needs before conception in Iran.

MATERIALS AND METHODS: This research was a qualitative study conducted in Bushehr city, Iran to explore men's reproductive health needs from April 2021 to November 2021. 30 semistructured interviews were conducted with married men, women, healthcare providers, and specialists individually in the health centers. The sampling method used in this study was purpose-based with maximum variety. All interviews were digitally recorded and transcribed verbatim in Persian and analyzed using directional content analysis. MAXQDA software version 12 was used to facilitate data analysis.

RESULTS: From the data analysis, 2 themes, 15 categories, and 38 subcategories emerged. The themes included evaluation and health promotion recommendations. It consisted of 10 categories: reproductive life plan evaluation, medical history evaluation, family and genetic history evaluation, social history evaluation, sexual health evaluation, medication evaluation, laboratory evaluation, physical examination, lifestyle evaluation, and mental health evaluation. Health promotion recommendations included five categories: nutritional recommendations, stress management, avoiding harmful behaviors, protective measures against harmful exposure, and need for education.

CONCLUSIONS: Our results showed that men need a comprehensive evaluation of reproductive health and recommendations to improve their health in the preconception period. Our study findings can inform healthcare providers to increase men's participation in reproductive health.

Keywords:

Men, preconception care, qualitative research, reproductive health needs

Introduction

Around the world, men tend to be the decision-makers within families, and strongly influence decisions concerning contraceptives and sexually transmitted infection (STI) prevention; the allocation of funds, transportation, and time for women to attend antenatal care or give birth; nutrition and workload during pregnancy; and health care for children.^[1] However, the status of male reproductive health, considered one of the most significant health

issues in society, has been less studied.^[2] The term "reproductive health" signifies a state of physical, psychological, and social well-being, not just the absence of illness in matters of the reproductive system.^[3] It is important to note that the concept of reproductive health is not limited to women. Men also have reproductive health needs that are very important to meet. In this regard, men have the right to access appropriate reproductive health services which enable them to have a healthy and pleasant reproductive life during marriage.^[4] Male reproductive health is a necessary

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pillar of childbearing. If a reproductive health assessment is conducted in the preconception period, the chance of a healthy pregnancy can increase.^[5] Preconception care for men focuses on prevention interventions implemented before conception of a first or subsequent pregnancy to enhance pregnancy and infant outcomes.^[6] Little attention has been paid to the reproductive health of men before pregnancy. It is necessary to pay attention to preconception care in men for six reasons: 1. Enhancing men's preconception health is essential to ensure that all pregnancies are planned and wanted. 2. Enhancing men's preconception health can improve pregnancy outcomes by enhancing men's biological and genetic contributions to pregnancy conception. 3. Women's reproductive health can improve by enhancing preconception health for men.^[7] As a result, the health of women, as half of society, impacts the health and well-being of family and society.^[8] 4. Women's reproductive health practice can improve by preconception health for men. 5. Preconception health for men can result in their improved capacity for parenting and fatherhood. 6. Preconception health care can improve men's health by providing access to primary health care.^[7]

According to the National Survey of Family Growth 2006–2010, approximately 60% of men aged 15–44 in the United States needed preconception care. More than 70% of men said they intended to have a child and had accessed care in the previous year. However, few men (<20%) reported receipt of STI/HIV testing or sexual health counseling (<11%), indicating a high unmet need for preconception care among men in the US.^[6]

There is little knowledge of men's preconception health and their readiness for pregnancy. Moreover, preconception care is not offered to men routinely. Therefore, to achieve a healthy pregnancy, it is necessary to promote male reproductive health in the preconception period by designing a male reproductive health care program in the health system. For this purpose, the first step is to identify the male reproductive health needs in the preconception period. Given that in the present study, the main research question is "What are the reproductive health needs before childbearing in married men?"; we aimed to explore the reproductive health needs of men before conception using qualitative research with a content analysis approach.

Material and Methods

Study design and setting

The present study was a qualitative study that aimed to explore the reproductive health needs of men before pregnancy through directional content analysis. The purpose of research in the method of qualitative directional content analysis is to test previous theories

or develop existing theories. A key feature of directional research is initial coding based on previous findings or prior theory. But, in the data analysis process, researchers immerse themselves in the data and allow categories to emerge from the data.^[9] The study settings were health centers in Bushehr city, Iran.

Study participants and sampling

Participants were selected from married men of reproductive age who were referred to health centers in Bushehr city, Iran. After explaining the objectives of the study to the men, volunteers were invited to participate in the study with informed consent. Furthermore, to better explore the reproductive health needs of men, interviews with married women of reproductive age, healthcare providers, and specialists with at least three years of work experience were conducted. The sampling method used in this study was purpose-based with maximum variety. The sampling continued until data saturation was reached and no new information was obtained. Finally, 12 married men, 5 women of reproductive age, 10 healthcare providers, and 3 specialists with at least three years of work experience participated in this study.

Data collection tool and technique

Semistructured, indepth interviews were conducted in Persian from April 2021 to November 2021. All interviews were digitally recorded and transcribed verbatim. The first author conducted face-to-face and telephone interviews to collect data. These interviews lasted between 30 and 60 minutes. The interviews were carried out in a private room at health centers. Some of the interviews were conducted via telephone due to the COVID-19 pandemic and the lockdown in Bushehr city.

Data analysis

Data analysis was performed using the directional content analysis method, guided by Mayring approach.^[10] In this type of content analysis, categories are previously defined, and the researcher searches for subcategories of these categories in the data. During data analysis, some data cannot be categorized into predefined categories. Thus, the researcher must use the conventional content analysis method and create new categories.^[9] In the present study, concurrent data collection and analysis were used. The audio file of the interviews was transcribed. The transcribed interviews were read several times to get a sense of the whole. The transcripts of the interviews were then coded. The codes were sorted and divided into subcategories and categories. MAXQDA software version 12 was used to facilitate data analysis.

For assessing the rigor of research data, initially, all interviews were conducted and coded by the first author. Credibility was established through participants' revision as member check, prolonged engagement with

participants and peer check. To ensure confirmability, a detailed description of the research steps was presented to co-authors and then confirmed by them. Maximum variation of sampling (men, women, healthcare providers, and specialists) also confirmed the credibility and confirmability of data. The authors described the analysis process to ensure dependability.

Ethical considerations

The Ethics Committee of Shahroud University of Medical Sciences approved this study (IR.SHMU.REC.1400.015). Participants gave written informed consent, and all data collected was kept confidential. The interviews were recorded with the permission of the participants. Also, at any stage of the research process, participants had the option of declining participation or withdrawing.

Results

The findings emerged from the data analysis of the face-to-face and telephone interviews with 12 married men, 5 women, 10 healthcare providers, and 3 specialists who participated in this study. The average age of the men in this study was 33 years, and the average work experience of healthcare providers was 10 years. The demographic characteristics of the participants in this study are shown in Tables 1 and 2. From the data analysis, 2 themes, 15 categories, and 38 subcategories emerged [Table 3]. The themes included evaluation and health promotion recommendations.

Evaluation

The primary purpose of the evaluation is to identify current problems affecting reproductive health that need attention. This theme consisted of 10 categories: reproductive life plan evaluation, medical history evaluation, family and genetic history evaluation, social history evaluation, sexual health evaluation, medication evaluation, laboratory evaluation, physical examination, lifestyle evaluation, and mental health evaluation.

Reproductive life plan evaluation

A reproductive life plan is a set of personal goals towards having or not having a child based on personal values and resources, and a plan to achieve those goals.^[11] Men participants in the present study did not have a plan for the number and timing of childbearing. They mentioned the need to have a fertility plan and make the right decision to have children. One of the men said:

"We planned to prevent pregnancy for a short time. Then, to try to get pregnant, we go to check and get the necessary information. Then, we try to get pregnant." (Man 6)

Table 1: Demographic characteristics of the men and women participants (n=17)

| Variable | n (%) |
|--------------------|---------|
| Gender | |
| Men | 12 (71) |
| Woman | 5 (29) |
| Age group | |
| 15-23 | 2 (12) |
| 24-34 | 9 (53) |
| 35-44 | 6 (35) |
| Education level | |
| Primary school | 2 (12) |
| High school | 2 (12) |
| University | 13 (76) |
| Employment status | |
| Employ | 13 (80) |
| Housewife | 4 (20) |
| Number of children | |
| 0 | 7 (41) |
| 1 | 7 (41) |
| 2 | 3 (18) |

Table 2: Characteristics of the healthcare providers and specialists participants

| Participant | Profession | Gender | Work experience (years) |
|------------------------|--------------------------|--------|-------------------------|
| Healthcare provider 1 | Midwife | Female | 22 |
| Healthcare provider 2 | Midwifery faculty member | Female | 9 |
| Healthcare provider 3 | Midwife | Female | 8 |
| Healthcare provider 4 | Public health | Male | 5 |
| Healthcare provider 5 | Health education | Female | 13 |
| Healthcare provider 6 | Midwife | Female | 10 |
| Healthcare provider 7 | Midwife | Female | 17 |
| Healthcare provider 8 | Midwife | Female | 8 |
| Healthcare provider 9 | Public health | Male | 6 |
| Healthcare provider 10 | Public health | Male | 6 |
| Specialist 1 | Urologist | Male | 7 |
| Specialist 2 | Gynecologist | Female | 5 |
| Specialist 3 | Infertility fellowship | Female | 8 |

Several men who did not intend to have children stated that they had no information about contraceptive methods and did not know where to go to get this information.

"We do not know about contraception. We didn't know which contraception method to use until we tried to get pregnant, so we got information online. I would like to know where I should get this information." (Man 6)

Medical history evaluation

An essential part of assessing preconception reproductive health is reviewing a person's medical history, including three subcategories: evaluation of sexually transmitted infections in men, evaluation of underlying disease in

Table 3: Themes, categories, and subcategories

| Themes | Categories | Subcategories | | | | |
|--------------------------------------|---|--|----------------------------|--------------------------------------|-------------------|----------------------|
| Evaluation | Reproductive life plan | Assessing the history of childbearing | | | | |
| | | Review of childbearing program | | | | |
| | | Contraception method | | | | |
| | | Assessment of genital and sexually transmitted infections | | | | |
| | | Assessment of the underlying Medical disease | | | | |
| | | Ensuring the health of the man before pregnancy. | | | | |
| | | Assessment of consanguineous marriage | | | | |
| | | history of congenital anomalies | | | | |
| | | Assessing high-risk behaviors | | | | |
| | | exposing to environmental risks | | | | |
| | | Assessing men's jobs | | | | |
| | | Sexual health disorders from the view of men | | | | |
| | | Assessment of sexual function | | | | |
| | | Assessing how to have sex | | | | |
| Recommendations for health promotion | Nutritional recommendations | Review of preconception medications | | | | |
| | | Recommendations for contraception in teratogenic therapies | | | | |
| | | Routine pre-pregnancy tests | | | | |
| | | Genetic tests | | | | |
| | | Semen analysis | | | | |
| | | General physical examination | | | | |
| | | Genital examination | | | | |
| | | Pre-pregnancy nutrition | | | | |
| | | Physical activity | | | | |
| | | Assessment of men's mental health | | | | |
| | | Assessment of men's mood | | | | |
| | | Healthy diet before conception | | | | |
| | | Supplements to take before pregnancy | | | | |
| | | Recommend exercise | | | | |
| Recommend appropriate nutrition | | | | | | |
| Recommendations for health promotion | Stress management | Avoid drugs use | | | | |
| | | Recommend quitting alcohol and tobacco | | | | |
| | | Lifestyle modification | | | | |
| | | Protection against X-rays and radioactive materials | | | | |
| | | Sex education | | | | |
| | | Educating related to the effect of age on fertility | | | | |
| | | Educating about high-risk behaviors | | | | |
| | | Educating about woman's physiological changes in pregnancy | | | | |
| | | Pre-pregnancy nutrition education | | | | |
| | | Recommendations for health promotion | Avoiding harmful behaviors | Sexual health | | |
| | | | | Medications | | |
| | | | | Laboratory tests | | |
| | | | | Physical examination | | |
| | | | | Life style | | |
| Mental health | | | | | | |
| Recommendations for health promotion | Protective measures in the harmful exposure | | | Need to education | | |
| | | | | Physical examination | | |
| | | | | Life style | | |
| | | | | Mental health | | |
| | | | | Recommendations for health promotion | Need to education | Physical examination |
| | | | | | | Life style |
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| Mental health | | | | | | |
| Physical examination | | | | | | |
| Life style | | | | | | |
| Mental health | | | | | | |

men, and ensuring the man's health before pregnancy. Regarding preconception health, the wife of one of the men participating in the study stated:

"Before pregnancy, both men and women need to ensure that they do not have a disease, especially infections that might cause miscarriage." (Woman 2)

Most participants emphasized the need to screen sexually transmitted diseases before pregnancy.

"I think very well if men screened for sexually transmitted infections and underlying diseases before conception." (Healthcare provider 1)

Family and genetic history evaluation

This category includes two subcategories: assessment of consanguineous marriage, and history of congenital

anomalies. The healthcare providers emphasized that it was necessary to review the history of abnormalities in the first-degree family of the couple before pregnancy.

"If men have a genetic disease in the family, they should undergo genetic testing." (Healthcare provider 8)

"If we have a miscarriage or have an incomplete baby (abnormality), must healthcare providers look for the cause and diagnose the problem. Then, they should refer the man for treatment." (Woman 2)

Social history evaluation

This category includes three subcategories: assessing high-risk behaviors, exposure to environmental risks, and assessing men's jobs. Participants in this study noted the adverse effects of high-risk behaviors, environmental exposure, and workplace hazards on reproductive health

and fetal development. In addition, healthcare providers considered it necessary to investigate these harmful pre-pregnancy exposures in men.

“High-risk behaviors of men can negatively affect fetal health. These behaviors can vary by region and geography. Men in our area often smoke or use fruit hookahs, which, according to them, is not harmful to the fetus.” (Healthcare provider 1)

“If the man’s job is to be exposed to harmful substances, these men should be screened and risk factors controlled before pregnancy. For example, a high-risk job is in the power plant, which causes frequent miscarriages in women.” (Healthcare provider 3)

Sexual health evaluation

This category includes three subcategories: sexual health disorders from the view of men, assessment of sexual function, and assessing how to have sex. The men in the present study saw sexual function health as a prerequisite for fertility.

“I think if a man is not sexually healthy, sperm may not be fertile. In addition, he may not be able to have appropriate sex. For example, some men do not have sexual desire, cannot have sex, and their penis does not erectile. Fortunately, I did not have such problems.” (Man 5)

The urologist who participated in the study stated that many men are not aware of proper sex for conception. So, couples categorize falsely in unexplained infertility. As a result, it is essential to evaluate sexual function in men before pregnancy.

“It is very interesting that many people have difficulty with doing sex that leads to fertility. Also, men do not even know the proper time of intercourse that increases the chance of fertility.” (Specialist 1)

Medication evaluation

This category includes two subcategories: review of preconception medications, and recommendations for contraception in teratogenic therapies. Most healthcare providers believe that screening for medications used by men is an essential reproductive health need in the preconception period that affects fetal development.

“Some drugs using men can cause abnormalities in the fetus. One of those drugs is finasteride, which some men use. And the doctor must give the necessary advice on contraception before prescribing this drug.” (Healthcare provider 3)

Laboratory evaluation

Most participants in this study mentioned the need for laboratory tests in the preconception period for men. Based on the findings of this study, laboratory evaluation

includes three subcategories: routine pre-pregnancy tests, genetic tests, and semen analysis.

“In my opinion, pre-pregnancy care for men is not only useful, but it is also necessary for men. It is equally important for men to undergo pre-pregnancy tests as well as women to ensure that the fetus will not be at risk.” (Woman 2)

Physical examination

This category includes two subcategories: general physical examination, and genital examination. The majority of healthcare providers in this study suggested that men should have a general and genital exam before conception to identify potential fertility problems. And timely treatment would help to improve the outcomes of fertility and the fetus.

“It is very important to note that many men are suffering from infertility for over 5 years, even despairing, and did not continue the treatment. While a simple examination of the genital can solve many of these problems.” (Specialist 1)

Lifestyle evaluation

This category includes two subcategories: pre-pregnancy nutrition and physical activity. Participants in this study repeatedly reported the effect of nutrition and exercise on sperm quality and fertility. Therefore, men’s lifestyles should be evaluated before pregnancy.

“I think a man should be complete a health file and be checked by a healthcare provider before wanting to have children. For example, how many hours a day he exercises. What the type of exercises he does, and the hormonal injections they use. All of these can affect the quality of their sperm.” (Healthcare provider 2)

Mental health evaluation

All healthcare providers believe that men’s mental health before pregnancy is a serious issue that needs attention. Mental disorders in men affect the mental health of children. Therefore, to achieve a successful pregnancy and promote infancy outcomes, all men must be evaluated for mental health before having children.

“The one issue is that more attention needs to be paid to men’s mental health. A man needs to be mentally OK and then have children. Because mental disorders may affect sperm quality. Mental health is very important and must be considered before pregnancy.” (Specialist 2)

Recommendations for health promotion

Health promotion is an essential component of preconception preventive services that aim to improve pregnancy outcomes. Health promotion was the second theme of the present study, which included five categories: nutritional recommendations, stress

management, avoiding harmful behaviors, protective measures against harmful exposure, and need for education.

Nutritional recommendations

This category includes two subcategories: healthy diet before conception, and supplements to take before pregnancy. In the present study, participants frequently mentioned that a healthy diet before pregnancy is important. And healthy diet has a positive effect on sperm quality. Therefore, men should be advised to follow a healthy diet before pregnancy. If necessary, dietary supplements such as folic acid should be recommended.

"Nutrition is very important. Before we intend to have a baby, we must take vitamins and have proper nutrition. And we mustn't have malnutrition. These are very effective." (Man 10)

Stress management

Participants in this study emphasized the need to pay attention to men's stress before pregnancy. Based on the findings of this study, stress management includes two subcategories: recommendations for exercise, and healthy nutrition.

"I think exercise and walking reduce stress. But these are not enough alone. It is also necessary to have fun and go to a quiet place without noise. Proper nutrition such as healthy fruits and vegetables and fortifying supplements such as vitamin D that doctors prescribe." (Man 10)

Avoiding harmful behaviors

This category includes two subcategories: avoiding drug-use, and recommend quitting alcohol and tobacco. Given that addiction, smoking, and alcohol consumption can negatively affect fetal health, healthcare providers should advise men to avoid smoking, consuming alcohol, and drug-use before having children.

"Men should stop using alcohol, drugs, smoking, and all that. I even read somewhere that up to two months before pregnancy, these things can affect sperm formation, so they should stop smoking and alcohol." (Woman 2)

Protective measures against harmful exposure

This category includes two subcategories: lifestyle modification and protection against X-rays and radioactive materials. Participants in the present study reported that the period of sperm formation is sensitive and vulnerable. It is necessary for men who intend to have children to stay away from harmful factors in this period and follow a healthy lifestyle.

"I think pre-pregnancy care is very important for men. Especially for my Husband, that works in nuclear medicine.

He exposes to radiation and radioactive materials. So the sperm is damaged. Therefore, men must try to stay away from radioactive materials for three months before getting pregnant." (Woman1)

Need to education

Men participating in the study frequently mentioned that they were unaware of preconception health and needed training. Education for men includes six subcategories: sex education, education related to the effect of age on fertility, education on high-risk behaviors, education on women's physiological changes during pregnancy, and pre-pregnancy nutrition. Men frequently mentioned the need for education in various domains of reproductive health. Also, a urologist reported that most couples classified with unexplained infertility did not know when and how to have sex to conceive.

"Interestingly, many people have difficulty in having intercourse that leads to fertility. And do not know the proper time to have intercourse for fertility. In our culture, sex education is weak. And we do not provide sex education in the family environment or the health system." (Specialist 1)

"Give training on appropriate sexual activity and the appropriate time for sexual intercourse for pregnancy. And set up a group class for men and women, and say, for example, what days are suitable for intercourse if you are planning to have children. This education helps couples a lot." (Man 4)

Also, the men were unaware of the effect of their age on fertility and neonatal outcomes.

"The age of a man is another factor to consider in the discussion of fertility. Men should know that fertility has a golden age. Therefore, the fertility treatments we use for 25-year-olds and 40-year-olds are very different." (Specialist 1)

Men should be educated about sexually transmitted infections and high-risk behaviors, which severely affect a couple's reproductive health, and lead to adverse pregnancy and fetal outcomes.

"In terms of sexual education, I mean to explain to men about the multiple sexual partners and the infections acquired through unprotected sex. And these can negatively affect themselves, their wives, and their children." (Healthcare provider 7)

"People who have multiple sexual partners, injecting drugs or consuming alcohol, and those who use harmful drugs that cause fetal malformations, should be educated." (Healthcare provider 3)

Some participants were interested to learn about preconception nutrition and the role of nutrition in determining the sex of the fetus. One of the men expressed:

"I thought more about the sex of the child since I would like to have a girl. I had a question before pregnancy about the relation between nutrition and the sex of the child, but no one taught us." (Man 5)

Also, another essential topic that needs to be educated to men is the physiological changes women experience during pregnancy. When they are aware of these changes, they can better understand their husbands.

"If men take classes before pregnancy and are educated about various possible side effects of pregnancy and the duties of couples in the months of pregnancy; this will help the pregnancy process a lot." (Man 4)

Discussion

Studies to investigate the reproductive needs of men, especially in the preconception period, were limited in Iran. Pregnancy involves both men and women, but most reproductive health programs target only women and ignore men's reproductive health. Therefore, this study was a qualitative study that aimed to explore the reproductive health needs of men before pregnancy through directional content analysis to design a reproductive health program in the preconception period for men. For this purpose, we interviewed married men, women, and healthcare providers. Our results showed that the reproductive health needs of men in the preconception period in Iran were consistent with the study published by Warner *et al.*^[12] Based on Warner Framework, our findings were categorized into two main themes: the need for evaluation and recommendations for health promotion. Frey *et al.*^[13] showed the content framework for men's preconception care, which can be used in clinical practice, and includes two main themes: risk assessment and health promotion. This is in line with the present study.

The evaluation was one of the themes extracted from the present study. Healthcare providers and specialists participating in the present study expressed that to achieve a successful pregnancy and promote neonatal outcomes, men should be comprehensively evaluated in the preconception period and identify risks that negatively affect their reproductive health. As a result, timely interventions prevent adverse pregnancy and adverse fetal outcomes. Kotelchuck showed that men's engagement in preconception care optimizes biological, psychological, and social factors. Thus, this has a positive impact on the health of men and potential children.^[7] Increasing evidence show that men are more likely to access family planning services and support their partners in family planning decisions when they are included as clients for reproductive health services.^[14]

Our findings showed that the theme of preconception evaluation includes several categories. One of these categories is the need to evaluate male fertility goals. By encouraging men to have a reproductive life plan and determining the number and timing of having children, unwanted pregnancy can be prevented. A study in Britain showed preconception health behaviors improved among men who have reproductive life plans.^[15] Short *et al.*^[16] showed men's reproductive needs have been neglected, and opportunities for safe fertilization strategies have been missed. This is in line with findings in our study.

The results of our study showed that in evaluating the reproductive health of men before pregnancy, attention to medical history and medication is very significant. Healthcare providers expressed that paying attention to men's diseases, sexually transmitted infections, and medications that affect sexual health and sperm quality can improve pregnancy outcomes. Evidence showed: various medical conditions can reduce sperm quality and sperm count, including diabetes mellitus, varicoceles, and epididymitis.^[17]

Based on the findings of the present study, men should be examined by a healthcare provider and a clinician for their general and sexual health during the preconception period. Also, the clinician should request the necessary laboratory tests for men. Choe *et al.*^[18] showed that clinicians should conduct a thorough physical examination for men in the preconception period. Hair patterns related to proper masculinization should be observed. In addition, the examination should be focused on the chest area (gynecomastia, nipple discharge), local neurological findings (loss of smell, visual field loss), and finally the genital area. Also, laboratory tests for pre-pregnancy management in men are not prescribed differently from women. This is in line with the present study.

Based on the findings of the present study, an important category in evaluating men's health before conception is the evaluation of family and genetic history. Assessing the birth defect history in the family, and the anomalies history in the couple's first-degree relatives is very helpful in preventing fetal anomalies. Choe *et al.*^[18] showed that male genetic risk should be assessed based on family history, age, and specific ethnicity. Occasionally, an autosomal recessive or sex-linked genetic disorder can skip generations, so a family history must be evaluated over three generations.

Other findings of the present study were the evaluation of the social history and lifestyle of men before pregnancy. These were frequently mentioned by healthcare providers and men participating in the

study. In this regard, avoiding high-risk behaviors such as quitting smoking, alcohol consumption, and adopting a proper lifestyle before pregnancy leads to men's improved health and successful pregnancy. Evidence has shown that male fertility is related to diet and weight.^[19] Also, parental obesity can predispose the unborn baby to disease in adulthood.^[20] Bodin *et al.*,^[21] in their qualitative study, showed that most fathers did not make any lifestyle adjustments before pregnancy to improve health and fertility. However, preconception lifestyle adjustments were more common in the case of pregnancy using assisted reproductive technology (ART) than in the case of spontaneous pregnancies. In fact, in spontaneous pregnancies, men do not receive care before attempting to conceive and are unlikely to be aware of the impact of lifestyle modifications on reproductive health. It shows the need for routine preconception care for men.

The findings in our study showed that men in the preconception period need to be evaluated for mental health and substance abuse. A qualitative study by Buzi *et al.*^[22] showed that young men expressed several healthcare needs, including sexually transmitted diseases, mental health, and substance abuse. They need healthcare clinics to provide comprehensive services.

Based on the findings of our study, the second theme was the need for recommendations to promote health to men. This theme consisted of several categories. Among these, the need for education in various domains of reproductive health in the preconception period was expressed frequently by men participating in the study. In this line, the findings of a quantitative study in Ahwaz, Iran, showed that men strongly feel the need to obtain information in all domains of sexual health.^[23]

Our study showed that men who intended to have children need to be trained in a healthy diet, quit smoking and consuming alcohol. In this line, pre-pregnancy recommendations by The British Nutrition Foundation suggests that excessive alcohol consumption may affect sperm quality. Therefore, men should adjust their intake to 3–4 units per day. Also, men who smoke are more likely to decrease their semen quality. They are advised to quit smoking if trying to conceive.^[24]

Based on our study findings, one of the educational needs that is essential for the preconception period is education on the effect of men's age on fertility. Hammarberg *et al.*^[25] showed that most people have limited knowledge of the negative impact of parental age on fertility and reproductive outcomes. In addition, Hviid Malling *et al.*^[26] reported the need for an educational campaign to raise awareness about the most fertile years for men and women. This is in line with the present study.

Hajizadeh *et al.*^[23] in Ahwaz, Iran, investigated the educational needs of adult men regarding sexual and reproductive health, and showed that the three most significant educational needs of men are male genital cancers, STD/HIV, and religious attitude towards gender. These educational needs are different from the educational needs obtained from the present study. One reason for this difference is that the present study was conducted qualitatively and examined married men of reproductive age about reproductive health needs in the preconception period.

Based on the results of the present study, nutritional advice, stress reduction, avoiding harmful exposures, and protective measures against occupational exposures can contribute to improving the health of men in the preconception period. Hoh *et al.*^[27] showed that nutrition management to prepare for pregnancy is not just a story for women. Men's nutritional status also directly affects sperm. If a man does not have balanced nutritional intake, his libido as well as sperm count decrease. Furthermore, occupational stress and harmful exposure in men often cause abnormalities in sperm count or quality. Excessive workload and stress can also lead to decreased libido. Therefore, men who are stressed by their work-life need to find a way to relax. By managing stress and providing effective coping skills, a person will be able to cope better with their life needs and challenges.^[28]

Limitation and Recommendation

This study was one of the few that explored the reproductive health needs of men in the preconception period in Iran. It was a novelty and strength in our study. However, further studies need to explore men's reproductive health needs in other cultures and countries.

Our study has some limitations. Translation of the interviews from Persian to English was a limitation of this study. Furthermore, the participants were from one geographical area and only included Persian-speaking participants. Therefore, the results could not necessarily be generalized to all Iranian men.

Conclusion

Our results showed that men need a comprehensive evaluation of reproductive health and recommendations to improve their health in the preconception period. As pregnancy is a joint product of men and women, it is essential to check the reproductive health of both women and men in the preconception period. Our study findings can inform healthcare providers to increase men's participation in reproductive health. Healthcare providers, especially midwives working in the primary

health care settings, should provide assistance and education for the men before pregnancy as a part of the preconception care.

Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

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