RESEARCH NOTE

The relationship between health life style and spermogram Indicators among infertile men: preliminary data

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Abstract

Objective: Inappropriate life style has destructive effects on sperm quality and, male fertility, so that lifestyle modification may improve spermogram indexes preliminary data. This study aimed to determine the relationship between health life style and spermogram Indicators among infertile men. This analytical descriptive cross-sectional study was conducted on 199 infertile men. The data were collected through the socio-demographic and Health Promoting Lifestyle Profile questionnaires. Descriptive statistics, independent t-test and Pearson correlation were used to analyze the data through SPSS.

Results: The mean (standard deviation) of total score of the health promoting lifestyle was (2.39 ± 0.39). The highest mean score was in Health Responsibility subscale (2.51 ± 0.52) and the lowest mean score was in the nutrition subscale (2.24 ± 0.44). Stress management showed significantly correlated with sperm morphology (p = 0.025). Also, spiritual growth with the Sperm concentration (p < 0.001), and sperm motility (p = 0.004) were statistically correlated, and health responsibility dimensions were statistically correlated with the Sperm concentration (p = 0.003) and sperm motility (p = 0.002). Considering that the mean of total score of the health promoting lifestyle and its correlation with some of spermogram indicators shows a need for improving lifestyle in infertile men who referred to infertility clinics.

Keywords: Male infertility, Lifestyle, Health promotion

Introduction

Although infertility is not a disease; it can cause disturbances in people's lives because it affects every aspect of a person's life [1]. According to world statistics, the prevalence of infertility among couples is 15% [2]. The prevalence of infertility in different parts of Iran has been reported differently, but the overall average of infertility in Iran is 13.2% [3]. The rate of male factor infertility has been growing faster than that of female factor infertility in recent decades [4]. Semen quality is one of the most important determinants of infertility in men. The prevalence of infertility in men has been increasing due to the decline in semen quality in recent decades [5]. The results of recent studies confirm a decrease in semen quality which has led to an increased willingness to conduct research on the effect of lifestyle on male fertility [6]. Inappropriate lifestyles have detrimental effects on sperm quality [7] and consequently male fertility [8] so that lifestyle change can improve spermogram parameters [9]. Improving lifestyle components can help people cope with daily stresses, and having a healthy lifestyle can play a role in happiness and preventing stress. Psychological stress itself has been recognized as one of the contributing factors in idiopathic male infertility [10]. In general, considering that one of the essential strategies for promoting health is to adopt a healthy lifestyle, as well as the importance of this subject and the limited information on the life style of Iranian infertile men, and

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given that all research in the area of relationship between
spiritual growth and infertility has been conducted in the
women’s domain and studies on the relationship between
spirituality, religion and fertility have not been conducted
in men; therefore, the present study was conducted to
determine the relationship between health lifestyle and
spermogram indexes in infertile men referred to the uro-
logy clinic in Tehran.

**Main text**

**Methods**

The present study is a cross-sectional study. The study
population included all infertile men referred to the com-
prehensive urology clinic in Tehran in 2018. The study
sample was considered as 199 individuals at 95% confi-
dence level and 80% test power, assuming that the corre-
lation coefficient between health lifestyle with each of the
spermogram indices in infertile men to be 0.2 and this
correlation to be considered statistically significant.

Sampling was conducted on a continuous basis. The
study inclusion criteria included men with Iranian
nationality, 20–50 years old, not working in high-risk
jobs in terms of effects on spermograms (such as building
painters, personnel of radiology, radiotherapy, nuclear
energy, etc.), not using infertility-related medication
during the past 3 months, no Incidence of psychological
illness according to the patient’s statement or record of
the patient, not having urinary tract infection or genital
infection, ability to read and write, and no history of vari-
icoce surgery.

Data collection tools included demographic question-
naires, spermogram indices data sheet and health pro-
moting lifestyle questionnaire which were completed by
the participants in the study.

The Health Promoting Lifestyle Questionnaire [11],
which has an English version of 52 items, is responded
with a 4-point response format (1 = Never, 2 = Some-
times, 3 = often, and 4 = routinely). The tool measures
health-promoting behaviors in six dimensions: nutrition,
Physical Activity, health responsibility, stress manage-
ment, Interpersonal Relations, spiritual growth.

Scoring for the Healthy Lifestyle was calculated using
an average of 52 questions for each of the 6 scales. The
tool has been translated into several languages and its
validity and reliability have been confirmed.

Two-week test–re test method was used for reliability
of the instrument which was 0.91 for overall profile and
ranged from 0.71 (spiritual growth) to 0.89 (nutrition).
The present study was approved by the Research Coun-
cil of Iran University of Medical Sciences after receiv-
ing the Code of Ethics (IR.IUMS.REC 1396,9413373005)
from the Ethics Committee of Iran University of Med-
ical Sciences. Complete descriptions of the purpose and
procedure of the study were also provided to the indi-
viduals during the sampling and they were assured of
the confidentiality of all information. Finally, written
informed consent was obtained from the samples.

Statistical analysis was performed using SPSS 20.
Descriptive statistics including frequency distribution as
well as central and dispersion indices such as mean and
standard deviation were used to describe health promot-
ing lifestyle and demographic characteristics. T-test and
Pearson’s correlation coefficient were used to determine
the relationship between lifestyle characteristics and
spermogram indices. Significance level for statistical tests
was considered less than 0.05.

**Results**

The highest percentage of participants was in the age
group of 31–40 years (64.8%) and the lowest percentage
was in the age group of 41–50 years (16.3%). The mean
age of the participants in this study was 35.46 ± 5.69 with
a maximum-minimum of 20–50 years. Other demo-
graphic characteristics of the participants are shown in
Table 1.

The mean and standard deviation of the overall health
promoting lifestyle score of the samples were equal to
2.39 ± 0.39 with a domain of 1.52–3.58 from the obtain-
able limit of 1–4. Highest score on health responsibil-
ity dimension (2.51 ± 0.52) with maximum domain of
1.22 ± 3.78 and lowest score on nutrition dimension
(2.24 ± 0.44) with domain of 1.22 ± 3.44 was observed
(Table 2).

Based on Pearson correlation and t-test, there was a
significant statistical relationship between the dimen-
sions of responsibility for health and spiritual growth
with all three spermogram indices (p < 0.05). In stress
management dimension, significant relationship was
observed only with sperm morphology (p-value = 0.003)
(Table 3). No significant relationship was found between
other dimensions of life style and spermogram indices.

**Discussion**

This study seemed to be the first study on infertile men
in Iran designed to determine the relationship between
infertile men’s lifestyle and sperm parameters. Results of
this study showed that the overall score of health promot-
ing lifestyle was 2.39 ± 0.39 with minimum–maximum
of 1.52–3.58. The highest score in health responsibil-
ity dimension (2.51 ± 0.52) with minimum–maximum of
1.22–3.78 and lowest score in nutrition dimension
(2.24 ± 0.44) with minimum–maximum of 1.22–3.44 was
observed. A similar study conducted by Mirghafourvand
et al. [12] on the relationship between health promot-
ing behaviors and demographic characteristics in infer-
tile couples in 2013. The results showed that among the
Table 1 Demographic, social and fertility characteristics of infertile men and their spouses referred to the comprehensive urology clinic in Tehran

| Characteristic                | Frequency (percentage) | Characteristic                | Frequency (percentage) |
|------------------------------|------------------------|------------------------------|------------------------|
| BMI                          | 18/5–24/9              | Age (year)                   | 20–30                  |
|                              | 25–29/9                |                              | 40–31                  |
|                              | 30–34/9                |                              | 41–50                  |
|                              | 35–39/9                | Job type                     | 84 (44)                |
|                              | 40+                    | Employee                     | 62 (32-5)              |
|                              | Diploma and lower diploma level |                     | 82 (41-8)              |
|                              | Associate Degree and Masters |                     | 71 (36-2)              |
|                              | Master's Degree and higher |                     | 43 (21-9)              |

Table 2 Numerical indices of dimensions and total score of health promoting lifestyle in the studied units

| Dimensions and total score of health lifestyle | SD   | M    | Minimum | Maximum |
|-----------------------------------------------|------|------|---------|---------|
| Nutrition                                     | 0.44 | 2.24 | 1.22    | 3.44    |
| Physical activity                             | 0.52 | 2.42 | 1.38    | 3.75    |
| Stress management                             | 0.49 | 2.47 | 1.13    | 3.70    |
| Health responsibility                         | 0.52 | 2.51 | 1.22    | 3.78    |
| Spiritual growth                              | 0.51 | 2.35 | 1       | 3.98    |
| Interpersonal relations                       | 0.43 | 2.25 | 1.22    | 3.44    |
| Total score of health lifestyle               | 0.39 | 2.39 | 1.52    | 3.58    |

Health promoting behaviors in men, the lowest score was related to physical activity and health responsibility, both of which had the mean value of 2.3 and standard deviation of 0.5 and the highest scores were related to nutrition and spiritual growth with the mean value of 2.6 and standard deviation of 0.5 in both. In this study, education level and income were predictive of health promoting lifestyle in the studied units. However, this study only examined the relationship between sperm parameters and lifestyle. In this study, there was no relationship between spermogram indices and the first dimension (nutrition) with the mean of 2.24, the second dimension (physical activity) with the mean of 2.42 and the fifth dimension (interpersonal relationships) with the mean of 2.25. The low average scores on these dimensions indicate the need for training and awareness of men in these areas. Regarding the third dimension (stress management), it was observed that stress management with mean of 2.47 in men with normal sperm morphology was significantly higher than that of men with abnormal sperm morphology. Since there was no study on the relationship between stress management and spermogram indices, the effects of stress on spermogram indices were investigated.

A study by Janecic et al. on stress and sperm quality showed that men who experienced two or more stressful events in their lives over the past year had a lower percentage of normal sperm motility and morphology compared to men who were not exposed to stressful events. But there was no difference in the number of sperms between the two groups [13]. The results of the present study were not significantly different from those of Janecic et al. Although stress management in males is not in a desirable level in this study; there is a direct relationship between mean stress management score and sperm morphology indicating the desirable effects of stress management on sperm indices improvement.

Table 3 The relationship between health life style and spermogram indicators among infertile men

| Lifestyle and its dimensions spermogram indicators | Lifestyle | Nutrition | Stress management | Physical activity | Interpersonal relationships | Spiritual growth | Health responsibility |
|---------------------------------------------------|-----------|-----------|-------------------|-------------------|---------------------------|------------------|-----------------------|
| Sperm count                                       | r=0.014  | p-value=0.046 | r=0.065 | p-value=0.35 | r=0.12 | p-value=0.074 | r=0.037 | p-value=0.611 | r=0.01 | p-value=0.88 | r=0.41 | p-value<0.001 | r=0.20 | p-value=0.003 |
| Sperm morphology                                  | r=0.06   | p-value=0.036 | r=0.75   | p-value=0.29  | r=0.16 | p-value=0.025 | r=0.017 | p-value=0.81  | r=0.05 | p-value=0.48 | r=0.11 | p-value=0.12  | r=0.20 | p-value=0.022 |
| Sperm motility                                    | r=0.012  | p-value=0.08  | r=0.53   | p-value=0.45  | r=0.10 | p-value=0.13  | r=0.09  | p-value=0.21  | r=0.073 | p-value=0.30 | r=0.20 | p-value=0.004 | r=0.22 | p-value=0.002 |
The results related to the dimension of responsibility for health indicated that this dimension has the highest dimension with mean of 2.51 ± 0.52 and minimum–maximum of 1.22–3.78. There was also a statistically significant relationship between this dimension of lifestyle and spermogram indices. It shows that men are prepared to receive health training to achieve well-being while men’s health training can be a strong point in training other health-promoting behaviors. No study was found to compare the results of the present study with that of the relationship between health responsibility and spermogram indices, which may indicate the innovation of this study.

Concerning the answer to the last specific goal of this study, namely determining the relationship between spiritual growth dimension with quantitative and qualitative indices of sperm in infertile men, the results of t-test indicated that there was a significant relationship between spiritual life style and all three spermogram indices (p-value < 0.05). A review study by Zimmer et al. [14] suggested that religion can reduce stressful life events by enhancing feelings of life satisfaction, optimism, confidence and a sense of social support. On the other hand, emotional stress affects the fertility of men by affecting the number and motility of sperm [10]. Findings of religion and stress management in this study provide evidence by which it can be concluded that religion can influence sperm indices through its effect on reducing anxiety. Based on what mentioned above, it seems that religion plays a less prominent role in controlling social stress because of the increasing stressors in the current society.

Conclusion
Given the health-promoting lifestyle score and all its dimensions in the middle of the domain of obtainable scores, there seems to be a need for interventions to improve the lifestyle of infertile men referred to infertility centers to improve their lifestyles and domains.

Considering that this study was conducted for the first time in Iran and that the lifestyles of different cities are different, it is therefore necessary to conduct a multicenter study on the population of men from different regions and cultures.

Limitations
Some limitations of the current study should be considered. Briefly, because of the cross-sectional design of this study, causal inferences could not be extracted; we were not able to declare whether spiritual growth was the reason for stress management. Therefore, our findings need to be confirmed in future with the bigger number of patients and than compare data and results to the group of healthy controls [11].

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Authors’ contributions
LA1 and LA2 designed the research; JH analyzed data, MK collected the samples, wrote the paper, conducted research and had primary responsibility for final content.

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Availability of data and materials
Data can be reached by contacting the corresponding author.

Ethics approval and consent to participate
Ethics approval for the study protocol was granted by The Human Ethics Committee of Iran University of Medical Sciences Grant ID: (IR.IUMS.REC 1396.941.3373005). Complete descriptions of the purpose and procedure of the study were also provided to the individuals during the sampling and they were assured of the confidentiality of all information. Finally, written informed consent was obtained from the participants.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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