

## Knowledge of Men and Women about Infertility Risk Factors

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### ABSTRACT

With technological developments, creation of new industries and changing lifestyles, infertility risk factors (IRF) increased. Therefore creation of suitable solutions in society is crucial for the prevention of infertility.

Since prevention of infertility in a society is directly related to awareness about infertility, in the present study the awareness of people about infertility risk factors was assessed.

In this study, a survey questionnaire containing 24 factors related to IRF was developed and 170 persons (62 men and 108 women) from Fooladshahr, Najafabad and Mobarakeh participated and data were extracted from these questionnaires and were statistically analyzed.

Our study showed that average infertility awareness for men and women is 38% and 49% respectively. Also overall awareness was 44%. Also results showed that women's awareness about mobile radiation and fast foods is significantly higher than men. On the other hand men have significantly higher awareness about adverse effects of chlorine in swimming pool on fertility. Higher women awareness may be related to their higher sensitivity for fertility. Also, generally a higher level of awareness was observed relating to mobile, air pollution, stress, fast foods, smoking and alcohol.

Women have a higher level of awareness about infertility risk factors. Higher awareness about some IRFs may be results from widespread media coverage.

**Key words:** Awareness, Infertility, Men, Women, Risk factor

### INTRODUCTION

Today, with the development of science and technology hundreds of new chemical products are being used in various industries, most of which could penetrate the atmosphere, water and soil and contaminate them in various ways [1]. If found their way into the human body these contaminants could leave various adverse effects most of which are harmful. Among such effects is the damage to the reproductive tissues which could lead to infertility [2-7]. The infertility can also be caused by other non chemical means including the rise of the body temperature (Through the excess use of sauna and hot water pools) [8], Mobile phone signals [9, 10], Heavy workload [11, 12], Stress and Anxiety [13] etc. All of these factors have led to significant rise of infertility worldwide which is being increased in number every year. Exposure to high temperature in hot water pools and sauna [14], rise of the body temperature due to fever [15], over exposure to the heat produced by

laptops placed on the laps and heat caused by tight dresses can increase the temperature in scrotum which could inhabit the production of sperm and thereby reducing the fertility in men [16, 17]. Lack of physical activity and using Fast foods [18, 19] are the underlying factors of many infertility related diseases and are linked to testis function and sperm production disorders in men [20-23] and Poly cystic ovarian syndrome in women [24]. In most cases, these problems can be addressed by simple changes in one's life style [25, 26]. Stress could also negatively affect fertility [8, 13, 27, 28]. Unhealthy diet, Drug and alcohol abuse can also affect fertility by disrupting one's sexual function. The abuse of alcohol can also inhabit the quality of the produced sperm. Smoking can also cause erectile dysfunction and affect the sperm motility [29-33]. Performance-enhancing drugs like Anabolic steroids can mimic the effects of male hormone testosterone. These drugs can decrease testicular size by inhibiting the secretion of reproductive hormones and the loss of sperm

production which would eventually lead to impairment of fertility [34-36]. Long-term use of anabolic hormones in women can lead to menstrual irregularities, infertility and ovulation disorders by inhibiting the secretion of hormones from the pituitary [37-39]. Various researchers have identified the effects of phone signals on fertility. Studies shows that mobile phone signals can increase the production of deformed sperms or the reduction of the amount produced sperm [40, 41]. Other studies suggest that other factors including changes in light intensity and exposure to intense or dimming light [42], use of microwaves [43], petrochemical work environment [44, 45], the existing chloride in drinking water and pools [6, 46], certain cosmetic products [47], certain medical drugs [48], pesticides and toxins [49], artificial ingredients and preservatives [50], prolonged standing [51] can also differently affect the fertility in both men and women. Lack of public awareness of the underlying factors of infertility has an adverse effect on fertility which could also lead to delayed pregnancy. Therefore increasing public awareness regarding the infertility cases is highly essential. In various countries studies are being carried out to determine the existing public awareness regarding the infertility factors most of which are suggesting a very low rating [52-58]. In Iran, despite the numerous studies conducted on infertility, the main targets of the studies are dominantly among the infertile individuals aimed at determining the level of awareness regarding infertility factors and its solutions. The first and the most essential step towards addressing the infertility issue is by increasing the level of public awareness regarding the risk factors therefore the main focus of this study is to determine the level of public awareness. Since most studies are showing a distinction in the level of

awareness between men and women [54,55], this study would attempt to compare the awareness ratings in both genders.

## MATERIALS AND METHODS

The current study was conducted in July 2015 by first determining 24 of the infertility risk factors with regards to the existing literature. The data collection was carried out using a researcher-made questionnaire. The questionnaire was divided into two sections: the first section was comprised of general characteristics of the individual (Gender, age, marital status and education) and the second section was consisted of questions relating to one of the infertility risk factors. Case options considered for the second section are "Effective", "Not Effective" and "Unaware". The scientific reliability of the questionnaire was also determined. Table.1 illustrates all the risk factors considered for this study. Also it should be mentioned that the reliability and validity of the questionnaire were checked by use of pre-sampling of size 15. In this introductory step a sample of size n=15 was chosen randomly and the Cronbach's alpha was calculated. The value of Cronbach's alpha was about 0.8.

The statistical society for this study was comprised of people currently living in Fouladshahr, Najafabad and Mobarakeh of Isfahan province. The number of participants in this study added up to 170 (62 men and 108 women) which were chosen from the aforementioned areas with no regards to marital status, number of children and other criteria. A simple random sampling (SRS) method was utilized for sampling. The questionnaire was then distributed among participants. Participants were then informed of the confidentiality of their information.

**Table 1:** List of infertility risk factors mentioned in the questionnaire

No.	Infertility risk factors	No.	Infertility risk factors
1	Temperature	13	Contact with chlorine in swimming pools
2	Cell phone radiation	14	Smoking
3	Light intensity	15	Drinking alcoholic beverages
4	Air pollution	16	Strenuous activities
5	Low quality drinking water	17	Cosmetic products
6	Fast food	18	Wearing tight clothes
7	Stress	19	Excess chlorine in drinking water
8	Strenuous exercise	20	Telecommunication towers
9	Microwave oven use	21	Excess use of laptop
10	Doping or using anabolic steroids	22	Pesticides
11	Working in petrochemical industries	23	Food preservatives
12	Prolonged standing	24	Some medical drugs

Previous studies suggested difference in the level of awareness between men and women. Thus, this study would attempt to compare the level of awareness in men and women in each previously mentioned risk factors. An overall comparison was also conducted

between both genders in respects to each risk factor using SPSS software. The comparison process was conducted using the Mann-Whitney nonparametric test.

**RESULTS**

*The participants' demographic information*

After the analysis of the information gathered in the first section of the questionnaire, the demographic information of the participants were gathered and represented in Table.2. The average age of women was 28.8 years with a minimum of 18 and maximal of 49 years. And the average age of men was 23.4 years with a minimum of 18 and maximal of 47.

*The comparison of awareness level between men and women*

The Table.3 represents all the gathered comparison information obtained from Mann-Whitney test. The results of the analysis suggest that the overall awareness of women regarding risk factors such as

Cell phone radiations and fast food are much more significant than that of men. On the other hand, the overall awareness of men regarding the chloride in swimming pools as an infertility risk factor was much more significant than that of women. No significant difference was observed regarding other risk factors between men and women.

**Table 2:** Participants' demographics

Parameter	Men	Women
<b>Number</b>	62	108
<b>Education</b>		
Bachelor of science	60	80
Higher than bachelor of science	2	28
<b>Marital status</b>		
Single	28	51
Couples	34	57

**Table 3:** Comparison of men's and women's awareness about infertility risk factors by using Mann-Whitney U test

Infertility Risk Factor	Mean Rank of women	Mean Rank of men	Mann-Whitney U test	P value
Temperature	54.6	55.68	1352.5	0.84
Cell phone radiation	50.35*	41.17	805	0.03
Light intensity	66.22	56.20	1540.5	0.11
Air pollution	51.11	47.65	997	0.48
Low quality of drinking water	60.73	57.34	1520	0.57
Fast food	52.83*	43.50	892.5	0.04
Stress	54.69	46.77	1007	0.117
Strenuous exercise	69.50	65.81	2080	0.56
Microwaves	57.08	48.61	1116	0.13
Doping	55.86	50.75	1119.5	0.34
Working in petrochemical industries	59.69	56.23	1429.5	0.56
Prolonged standing	75.89	74.89	2649	0.87
Contacting with chlorine in swimming pools	72.44*	87.36	2459	0.01
Smoking	55.82	53.52	1307.5	0.66
Alcoholic drinking	57.92	49.06	1100.5	0.117
Heavy activities	65.98	57.09	1495	0.16
Cosmetic products	77.23	969.5	2257.5	0.25
Wearing the tight cloths	71.20	70.62	2256	0.92
Excess chlorine in drinking water	66.58	66.35	2009	0.97
Telecommunication towers	55.41	47	1026	0.09
Excess use of laptop	75.53	65.8	2044	0.14
Pesticides	61.94	950.5	1204	10.5
Preservatives	54.74	48.26	1071.5	0.22
Some Medical drugs	48.90	49.18	1050	0.95

\* Statistically significant differences between men and women

*An overall awareness comparison between men and women*

Study results suggest that the average awareness level in women in the study area is 49% while showing a lesser result of 38% for men. The overall awareness of both genders was also 44%.

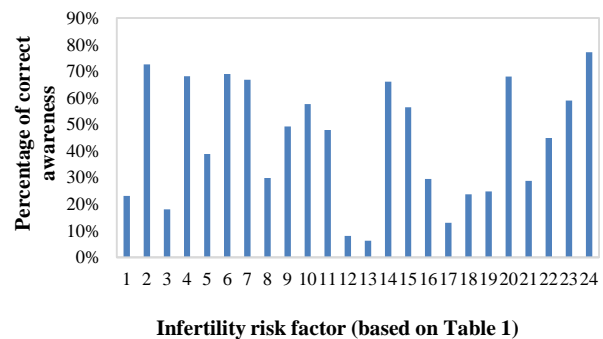
*Overall awareness comparison between singles and couples*

The awareness level of infertility risk factors in single women was calculated at 21/73% and in married women showed the result of 16/59%. While for single and married men it was respectively 53% and 21%.

*Comparison of awareness level regarding each risk factor*

The graph presented in Fig.1 represents the overall awareness regarding each infertility risk factor. The

level of awareness about Cell phone radiations, air pollution, Anxiety, Fast foods, Smoking, alcohol and some medical drug consumption was relatively higher than the other risk factors.



**Fig. 1.** Overall percentage of awareness about infertility risk factors.

## DISCUSSION

The study results showed that the awareness level of women regarding risk factors such as Cell phone radiations and Fast foods was significantly higher than men's. On the other hand, the awareness level of men regarding infertility risks of chloride in swimming pool was significantly higher than women. Our previous study about students' awareness about infertility risk factors showed that female students have significantly greater awareness about detrimental effects of cell phone radiation and fast food on fertility than in males which is consistent with our present results but in that mentioned study the significantly higher awareness among men in comparison to women was about smoking [59]. In contrast to our results Rouchou *et al.* [56] showed that awareness of men and women about the effects of radiation on human fertility is equal which is opposite to our previous and present results. Also they showed that similar proportions of male and female students knew about the adverse effects of environmental factors on fertility which is inconsistent with our results [56].

The study results suggested that the average awareness level of women regarding the infertility risk factors in the study area was higher than that of men. Other studies also illustrated such difference [57, 59]. But Rouchou *et al.* suggested that the awareness level of men and women about infertility risk factors are almost equal [56]. The reason behind this transcendence in awareness level in women could be due to their higher concerns regarding infertility and the fear of not being able to have a child.

The overall awareness level of both men and women was 44% which is not very high. Other studies have shown a lack of adequate knowledge about infertility risk factors [52-54]. In comparison to our previous study, the overall awareness of students is higher than that of the people participated in the current study (55.86% versus 44%).

Considering that the participants' fields of study in our previous research were mainly engineering related such as chemical engineering, mechanical engineering and civil engineering, no course relating to reproduction and fertility is in their curriculum. Therefore their superior knowledge of IRFs in comparison to participants of the present study could not be related to educational attainment and is solely through the media.

Also the students' age was lower than participants of the present study and since they are in their fertility ages, their higher awareness may be related to their concerns about their fertility and higher affinity of students for extra-university.

We have also illustrated that the awareness level in singles is much higher than couples. This could stem from two reasons: First, most of the couples with children seemed to have less concern about the infertility risk factors. Second, the average age in couples is much higher than singles. The ease of access to multimedia, internet, social networks, etc for teenagers provides them with a wider range of information regarding infertility risk factors. These two reasons could be the underlying causes of awareness levels between couples and singles. According to the obtained results, the General awareness regarding risk factors such as Cell phone radiations, air pollution, anxiety, fast foods, drugs and alcohol is higher than the rest which could be due to the emphasize put on them by the media.

The results obtained from this study indicate a need for better informative solutions through advertisements and public education in society. These results also reveal the effectiveness of the existing informative means and the necessity of promoting more education based programs in order to provide singles and couples with much broader and more complete information regarding the infertility risk factors. Spread of infertility in various societies suggests our need for more informative beds by providing adequate and up to date information regarding these risk factors. Therefore providing more reading material for students in high schools and college and also producing more education based programs in media is deemed necessary.

### *Study limitations*

One of the limitations of this study is the difficulty in expanding the results. The participants from the study were only selected from 3 cities which could not speak for the entirety of the society. Thus we encourage similar studies with more participants to partake to obtain more accurate results. It is also possible that the type of the designed questions might have provoked some participants who did not or were not sure to select answers which they thought might be an effective factor.

## ETHICAL ISSUES

Ethical issues such a plagiarism have been observed by the authors.

## COMPETING INTEREST

The authors declare that there is no conflict of interest.

## AUTHORS' CONTRIBUTIONS

All authors of this study have a complete and equal contribution for data collection, data analyses and manuscript writing.

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