The risk factors of infertility in women referred to Ilam health care centers in 2013: A cross-sectional study

Ashraf Direkvand-Moghadam[1], Ali Delpisheh[2*], Azadeh Direkvand-Moghadam[3]

1. Psychosocial Injuries Research Center, Faculty of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran
2. Department of Clinical Epidemiology, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran
3. Student Research Committee, Ilam University of Medical Sciences, Ilam, Iran

***Corresponding author:** Tel: +98 8432240404 Fax: +98 8432240404
Address: Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran
E-mail: alidelpisheh@yahoo.com
Received: 2015/06/6 revised: 2015/06/30 accepted: 2015/07/21

Abstract

Introduction: Infertility is a major problem in today´s medicine. Infertility is known a health indicator and the right to infertility treatment is part of Millennium Development Goal. The present study aimed to determine the risk factors of infertility, in women referred to both public and private health centers in Ilam.
Materials and methods: A cross-sectional study was carried out among women attending in both public and private health centers in Ilam, in 2013. A simple random sampling method was used. Inclusion criteria consisted of married women in all age groups. Women with marriage times less than 12 months were excluded. Demographic characteristics and main data about reproductive events, contraceptive use, medical and surgical histories and familial histories were recorded. Differences were regarded statistically significant with an alpha error of 0.05.
Results: Overall, 11.5% of all participants experienced of primary or secondary infertility in their life. A significant relationship reported between age, smoking, women´s occupation, husband´s occupation, women´s education, husband´s education with infertility ($P < 0.05$).
Conclusion: Ageing, smoking, occupation, level of education and age at marriage are effective factors on the prevalence of infertility. Therefore, education about the risk factors of infertility is necessary for couples receiving primary health care.

Keywords: Cross-sectional study, Ilam, Prevalence of infertility, Primary health care

Introduction

Most couples have successfully conceived after one year of regular unprotected sexual intercourse (1). Infertility is a major problem in today´s medicine. It is known a Health indicator and the right to infertility treatment is part of Millennium Development Goal (2).
About 72.4 million couples around the world experience primary or secondary infertility (3). The infertility rates for different countries are range 5-30% (4). Approximately 5-10% of women in the reproductive ages are affected by infertility (5, 6). One of four couple are affected by infertility in developing countries (7).
Infertile couples are divided into two main groups the primary and secondary infertility. The primary or secondary infertility will occur for almost 15% of all women worldwide (8).
Persons suffering, psychological disorders (9, 10), sexual dysfunctions (11, 12) and the marital discord (9) are main physical and psychological impact infertility among

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]

infertile couples. The researchers used of recognized infertility risk factors for the management of infertility (13, 14). It well known that the age, BMI, age at onset of sexual activity, prior pelvic surgeries, Polycystic Ovary Syndrome (PCOS) PCO (15), Premature Ovarian Failure (POF) (16), hyperprolactinemia (17), emotional stress (18), Pelvic Inflammatory Disease (PID) (19, 20) endometriosis ,(19, 21), uterine malformation (22) adenomyosis (23), asherman syndrome (24, 25), tubal blockage (19, 26), cervical stenosis (27), smoking (28), diabetes29, 30) thyroid disorders (31), life style (32-34) and occupation (35) are main risk factors for women's infertility (36).

Infertility is a serious complication in reproductive age women. Therefore, detection of epidemiological and clinical risk factors of infertility is necessary. The present study was conducted to determine the risk factors of infertility, in women referred to both public and private health centers in Ilam, west of Iran, in 2013.

Materials and methods

A cross - sectional study was carried out to determine the risk factors of infertility among women attending in both public and private health centers in Ilam, west of Iran, in 2013.

We have considered $\alpha = 0.5$ and $d = 0.02$, therefore, 1013 eligible women participated in the study. A simple random sampling method was used. Inclusion criteria consisted of married women in all age groups. Women with marriage times less than 12 months were excluded.

This study was undertaken with the approval of the Ethical Committee of the Ilam University of Medical Sciences. The aim of the study was described for participants before the enrollment in the study .

Demographic characteristics were collected. Main data about reproductive events, contraceptive use, medical and surgical histories and familial histories were recorded. We considered the infertility as disability to conceive live birth after 12 months of unprotected sexual intercourse. Women who have never been able to become pregnant after at least one year of unprotected intercourse were considered as primary infertility. All women who have been pregnant at least once, but have not been able to become pregnant again were considered as secondary infertility.

Results were expressed as Mean ± SD. The Kolmogorov-Smirnov test was used to test the normality in continuous variables. The independent T-test was used to compare means. The chi - square test was used to explore the relationship between nominal variables. Both Unvaried and Multivariate logistic regression analyses were used to indicate the association between dependent (with infertility vs. without infertility) and independent variables. A P-value less than 0.05 were considered as significant level. Statistical analysis was performed using SPSS statistical software (version 16.0; SPSS Inc., Chicago, IL, USA) .

Results

A total of 1013 women was studied. Overall, 896 (88.5%) of all participants hadn't experienced of primary or secondary infertility. While 117 (11.5%) women were put into the infertile group. The Mean ± SD age was 31.1 ± 7.9 years in fertile and 38.1 ± 7.77 in infertile women. A significant relationship reported between age, smoking, women´s occupation, husband´s occupation, women´s education, husband´s education with infertility ($P < 0.05$). There was a significant relationship between age at marriage and infertility. However there was no significant relationship between age at menarche and infertility. The overall distribution of infertility according to age at marriage are presented in table 1.

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]

Table 1. The overall distribution of infertility according to age at marriage between groups.

Reproductive Status	N (%)	Age at marriage (year)*	P value
Fertile	896 (88.5)	22 ± 1.55	0.000
Primary infertility	37(3.7)	25.27 ± 1.03	0.001
History of primary infertility	16(1.6)	23.94 ± 0.84	0.020
Secondary infertility	25(2.5)	22.44 ± 0.65	0.000
History of Secondary infertility	7(0.7)	23.71 ± 0.29	0.002
Both primary and secondary infertility	6(0.6)	14.41 ± 1.01	0.000
Never been pregnant	26(2.6)	19.46± 1.43	0.000
Total	1013(100)		

* Data shown as Mean ± SD.

This study showed that the etiological cause of infertility for 56 % of the couples was a female factor. Among the female causes of infertility ovulatory dysfunction (42.2%) was the most frequent etiological factor reported by participants. In 20% of participants the causes of infertility were unexplained. In 18.1% male factors and 7.8% both male and female factors were the etiological cause of infertility.

Duration of achieving a successful pregnancy was evaluated in infertile women. Women with primary infertility spent least time for achieving a successful pregnancy, while women who never been pregnant, had spent most of the time for achieving a successful pregnancy. The overall distribution of infertility according to the time for achieving a successful pregnancy is presented in table 2.

Table 2. The overall distribution of infertility according to time trying to have a baby between infertile women.

Reproductive Status	N (%)	Time for achieving a successful pregnancy (year)*
Primary infertility	37(31.62)	4.22 ± 0.32
History of primary infertility	16(13.67)	8.69± 1.18
Secondary infertility	25(21.36)	4.88 ± 0.83
History of Secondary infertility	7(6)	5.29± 0.56
Both primary and secondary infertility	6(5.13)	9.17 ± 0.98
Never been pregnant	26(22.22)	11.12 ± 1.84
Total	1013(100)	

* Data shown as Mean ± SD.

The purpose of the present study was to determine the risk factors of infertility, in women referred to both public and private health centers in Ilam, in 2013 .

Based on the results, 11.5% of participants in the present study experience a type of primary, secondary or both types of infertility in their life. A study reported that 21-22% of women experience primary infertility during their marital life (37). In an Iranian meta-analysis study, the pooled prevalence of infertility was 13.2% (95% CI: 8-18.3) (38).

The results of the present study reported a significant relationship between age, smoking, women´s occupation, husband´s occupation, women´s education, husband´s education and age at marriage with infertility. Other studies confirm the relationship between occupational factors and infertility (39, 40). A study reported increasing of marriage age as a cause of increasing the infertility rates in recent years (38). Several studies showed a relationship between aging and infertility (41, 42).

The present study showed that the female factor is the most common etiological cause of infertility. In confirm of our results, an Iranian meta-analysis study, reported the female factor as the common cause of infertility in infertile Iranian couples (43).

Based on our results, ovulatory dysfunction was the most frequent etiological factor reported among the female causes of infertility. Another study confirmed with our results (43).

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]

However, a previous study reported the male infertility as the most common causes of infertility, but also, a study confirmed our research and reported that the male fertility has been decreased in some populations in special geographic areas (43).

Based the results of the present study, 20% of infertile couples have unexplained infertility. Unexplained infertility is an important issue in infertility treatment. Because, couples with unexplained infertility might have the lower extremes of fertility. A study reported a range between 10-30% of unexplained infertility (43).

In the present study women with primary infertility had spent least time for achieving a successful pregnancy, while women who never been pregnant, had spent most of the time for achieving a successful pregnancy. Infertility treatment options and success are varied based on the cause of infertility. However, typically the evaluation and treatment of infertility will perform in couples after one year of regular sexual life without the use of contraceptive methods, but also, the assessment and treatment will be done in women over 35 years after 6 months of regular sexual life without the use of contraceptive methods (44). In other words, the duration of infertility treatment declined in recent years because of advances in technology to diagnose and treat infertility (45, 46).

Ageing, smoking, occupation, level of education and age at marriage are effective factors on the prevalence of infertility. Therefore, education about the risk factors of infertility is necessary for couples receiving primary health care.

Acknowledgements

This project was financially supported by Ilam University of Medical Sciences; we would like to acknowledge the contribution of the Deputy for Research.

References

1. Al-Inany H. Female infertility. Clin Evid. 2006;(15):2465-87.
2. Portman MT, Martin EJ. MEDICAL brigades, global health and the united nations: millennium development goals and developing nations. J Health Hum Serv Adm. 2015;38(1):90-107.
3. Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. Hum Reprod. 2007 ;22(6):1506-12.
4. Larsen U. Primary and secondary infertility in sub-Saharan Africa. Int J Epidemiol. 2000 ;29(2):285-91.
5. Tesfaghiorghis H. Infecundity and subfertility among the rural population of Ethiopia. J Biosoc Sci. 1991;23(4):461-75.
6. Direkvand-Moghadam A, Delpisheh A, Khosravi A. Epidemiology of Female Infertility; A Review of Literature. Biosci, Biotech Res Asia. 2013;10(2):559-67.
7. Mascarenhas M, Flaxman S, Boerma T, Vanderpoel S. National, regional, and global trends in infertility prevalence since 1990: A systematic analysis of 277 health surveys. PLOS Medicine. 2012;9 (12):e1001356.
8. Kumar D. Prevalence of female infertility and its socio-economic factors in tribal communities of Central India. Rural Remote Health. 2007;7(2):456.
9. Volgsten H, Skoog Svanberg A, Ekselius L, Lundkvist O, Sundstrom Poromaa I. Risk factors for psychiatric disorders in infertile women and men undergoing in vitro fertilization treatment. Fertil Steril. 2008;93(4):1088-96.
10. Volgsten H, Ekselius L, Poromaa IS, Svanberg AS. Personality traits associated with depressive and anxiety

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]

disorders in infertile women and men undergoing in vitro fertilization treatment. Acta Obstet Gynecol Scand. 2010;89(1):27-34.
11. Drosdzol A, Skrzypulec V. Evaluation of marital and sexual interactions of Polish infertile couples. J Sex Med. 2009;6(12):3335-46.
12. Drosdzol A, Skrzypulec V. Depression and anxiety among Polish infertile couples--an evaluative prevalence study. J Psychosom Obstet Gynaecol. 2009;30(1):11-20.
13. Busso D, Onate-Alvarado MJ, Balboa E, Zanlungo S, Moreno RD. Female infertility due to anovulation and defective steroidogenesis in NPC2 deficient mice. Mol Cell Endocrinol. 2010 5;315(1-2):299-307.
14. Cai X, Song R, Long M, Wang SF, Ma YR, Li X, et al. [A cross-sectional study on the current status of female infertility in three counties of Xinjiang Uygur Autonomous Region]. Zhonghua Yi Xue Za Zhi. 2011;91(45):3182-5.
15. Brassard M, AinMelk Y, Baillargeon JP. Basic infertility including polycystic ovary syndrome. Medical Clinics of North America. 2008;92(5):1163.
16. Chatterjee S, Modi D, Maitra A, Kadam S, Patel Z, Gokrall J, et al. Screening for FOXL2 gene mutations in women with premature ovarian failure: an Indian experience. Reprod Biomed Online. 2007;15(5):554-60.
17. Motazedian S, Babakhani L, Fereshtehnejad SM, Mojthahedi K. A comparison of bromocriptine & cabergoline on fertility outcome of hyperprolactinemic infertile women undergoing intrauterine insemination. Indian J Med Res. 2010;131:670-4.
18. Schenker JG, Meirow D, Schenker E. Stress and human reproduction. Eur J Obstet Gynecol Reprod Biol. 1992;45(1):1-8.
19. Aziz N. Laparoscopic evaluation of female factors in infertility. J Coll Physicians Surg Pak.2010;20(10):649-52.
20. Sami N, Ali TS, Wasim S, Saleem S. Risk factors for secondary infertility among women in Karachi, Pakistan. PLoS One.2012;7(4):e35828.
21. Manconi F, Markham R, Fraser IS. Culturing endothelial cells of microvascular origin. Methods Cell Sci. 2000;22(2-3):89-99.
22. Saravelos SH, Cocksedge KA, Li TC. Prevalence and diagnosis of congenital uterine anomalies in women with reproductive failure: a critical appraisal. Hum Reprod Update. 2008;14(5):415-29.
23. Campo S, Campo V, Benagiano G. Infertility and adenomyosis. Obstet Gynecol Int. 2012;2012:786132. Buttram VC, Jr., Turati G. Uterine synechiae: variations in severity and some conditions which may be conducive to severe adhesions. Int J Fertil. 1977;22(2):98-103.
24. Rochet Y, Dargent D, Bremond A, Priou G, Rudigoz RC. [The obstetrical future of women who have been operated on for uterine synechiae. 107 cases operated on (author's transl)]. J Gynecol Obstet Biol Reprod (Paris). 1979;8(8):723-6.
25. Palihawadana TS, Wijesinghe PS, Seneviratne HR. Aetiology of infertility among females seeking treatment at a tertiary care hospital in Sri Lanka. Ceylon Med J. 2012;57(2):79-83.
26. Pabuccu R, Ceyhan ST, Onalan G, Goktolga U, Ercan CM, Selam B. Successful treatment of cervical stenosis with hysteroscopic canalization before embryo transfer in patients undergoing IVF: a case series. J Minim Invasive Gynecol. 2005;12(5):436-8.
27. Delpisheh A, Brabin L, Brabin BJ. Pregnancy, smoking and birth outcomes. Womens Health (Lond Engl). 2006;2(3):389-403.

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]

28. Codner E, Merino PM, Tena-Sempere M. Female reproduction and type 1 diabetes: from mechanisms to clinical findings. Hum Reprod Update. 2012;18(5):568-85.
29. Cai X, Song R, Long M, Wang SF, Ma YR, Li X, et al. [A cross-sectional study on the current status of female infertility in three counties of Xinjiang Uygur Autonomous Region]. Zhonghua Yi Xue Za Zhi. 6;91(45):3182-5.
30. Unuane D, Tournaye H, Velkeniers B, Poppe K. Endocrine disorders & female infertility. Best Pract Res Clin Endocrinol Metab. 2011 Dec;25(6):861-73.
31. Olive DL. Exercise and fertility: an update. Curr Opin Obstet Gynecol. 2010;22(4):259-63.
32. Gudmundsdottir SL, Flanders WD, Augestad LB. Physical activity and fertility in women: the North-Trondelag Health Study. Hum Reprod. 2009;24(12):3196-204.
33. De Souza MJ. Menstrual disturbances in athletes: a focus on luteal phase defects. Med Sci Sports Exer. 2003;35(9):1553-63.
34. Baste V, Moen BE, Riise T, Hollund BE, Oyen N. Infertility and spontaneous abortion among female hairdressers: the Hordaland Health Study. J Occup Environ Med. 2008;50(12):1371-7.
35. Romero Ramos R, Romero Gutierrez G, Abortes Monroy I, Medina Sanchez HG. [Risk factors associated to female infertility]. Ginecol Obstet Mex. 2008;76(12):717-21.
36. Kazem M, Ali A. An overview of the epidemiology of primary infertility in iran. J Reprod Infertil. 2009;10(3):213-6.
37. Direkvand–Moghadam A, Delpisheh A, Sayehmiri K. The trend of infertility in Iran, an original review and meta-analysis. Nurs Pract Today. 1014;1(1):46-52.
38. Joffe M. What has happened to human fertility? Hum Reprod. 2010;25(2):295-307.
39. Povey AC, Stocks SJ. Epidemiology and trends in male subfertility. Hum Fertil (Camb). 2010;13(4):182-8.
40. Danforth D, Scott J. Danforth's Obstetrics and Gynecology. 9th ed. London: Lippincott Williams & Wilkins; 2003.
41. Oliva A, Spira A, Multigner L. Contribution of environmental factors to the risk of male infertility. Hum Reprod. 2001;16(8):1768-76.
42. Parsanezhad M, Namavar Jahromi B, Zare N, Keramati P, Khalili A, Parsa-Nezhad M. Epidemiology and Etiology of Infertility in Iran, Systematic Review and Meta-Analysis. J Womens Health. 2013;2(6):124-9.
43. Quaas A, Dokras A. Diagnosis and treatment of unexplained infertility. Rev Obstet Gynecol. 2008;1(2):69-76.
44. Liu K, Case A. Advanced reproductive age and fertility. J Obstet Gynaecol Can. 2011;33(11):1165-75.
45. Kimberly L, Case A, Cheung AP, Sierra S, AlAsiri S, Carranza-Mamane B, et al. Advanced reproductive age and fertility: no. 269, November 2011. Int J Gynaecol Obstet. 2012;117(1):95-102.

[Downloaded from jbrms.medilam.ac.ir on 2026-11-26]