# Research Paper
# The Socio-economic Status Predicting Women's Reproductive Health: A Prospective Cohort Study in Ardabil City, Iran, 2017-2020

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## ABSTRACT

**Background:** Women often have many reproductive health problems in developing countries. Economic and social factors play a vital role in health outcomes. This study aimed-predict women's reproductive health from socio-economic status in Ardabil City, Iran in 2020.

**Methods:** A cross-sectional study was conducted based on a prospective cohort study in Ardabil in March 2020. Out of 9,000 eligible participants (35-70 years old and living in Ardabil), 368 women were included in the study with systematic random sampling. A checklist was used-collect all patient information from the Ardabil Persian Cohort study. Data were analyzed using descriptive statistics, logistic regression, and multivariate regression analysis. The significance level was 5%. Data were examined using statistical SPSS software, version 21.

**Results:** The results showed a significant statistical relationship between socio-economic status and women's reproductive health (P<0.001). Women with higher socio-economic status had fewer reproductive health issues, such as infertility (P<0.001), and tubectomy (P=0.004), abortion (P<0.001), stillbirth (P<0.001), atypical menopause (P<0.001) and hysterectomy (P=0.021).

**Conclusion:** The findings showed a significant inequality in reproductive health status among women who were at different socio-economic levels. Policymakers should consider these results-promote women's reproductive health.

**Keywords:** Socio-economic status, Reproductive health, Women

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## 1. Introduction

One of the most crucial phases in maintaining community health is-promote reproductive health and address its other dimensions at the national and international levels. Reproductive health refers-all the critical stages in the health insurance of family members, particularly women and girls, from birth-death [1]. Approximately 810 daily maternal deaths is estimated in 2017, 2 million stillbirth cases, and 295,000 newborn deaths within 28 days of birth every year [2-4].

Reproductive health programs have a direct impact on decreasing child and maternal death rates, preventing severe and expensive diseases, enhancing the quality of life, and increasing functional life expectancy. According-the action plan and document of the international conference on population and development (ICPD) in Cairo in 1994, it is described as "entire physical, mental, and social well-being that includes all parts of the reproductive system, its process, and function." It implies that people can choose how, when, how often, and when-have children. Consequently, no conflict exists between awareness and access-secure, efficient, cost-effective, and acceptable family planning as well as the right-health care that allows women-experience pregnancy and delivery safely. Social changes, technological developments, and people's knowledge and awareness have improved women's reproductive health in developed countries in recent decades, but still many challenges are observed in the field of reproductive health in underdeveloped countries which is due-women's lack of awareness [1, 5].

On the other hand, women's health is significantly influenced by their socio-economic status [6].

According-several studies, one of the biggest impediments-the adoption of contraceptive methods is poor socioeconomic status, and it is critical-consider women's financial stability while developing suggestions for how-counsel on contraceptive methods [7]. Menstrual disorders, which are among the most common illnesses in adult women, appear-be related-socioeconomic status, specifically education and family income [6]. Menstrual issues are more common among working women, maids, and salesmen [8].

Women with low socioeconomic status, on the other hand, do not have favorable nutritional status, highlighting the importance of socioeconomic status in personal health [9].

Education reassures women about the human reproductive system and raises their awareness of contraception, and caring behaviors at various stages of pregnancy, such as prenatal, postpartum, and postnatal periods, the interval between births, and newborn care [10].

A person with a low socioeconomic status will have poorer health. Shifotoka et al., who believe that social and economic inequality has a detrimental influence on physical health, are among those who have contributed-this effort [11]. One study identified socioeconomic status as one of the causes of common mental problems in women [12].

Women around the world have been victims not only of social rights but also of unequal opportunities [13]. Long-term social and economic factors have an impact on both physical and mental health [14].

According-the findings of Pourmohsen et al.'s study, at the Gilan University of Medical Sciences, a substantial correlation was observed between social inequality and the economic health of employing women, and social and economic disparity predicted 13% of employing women's health [15]. A relationship is observed between economic disparities and health and social problems, and people with higher incomes practice better [16].

According to Khavari et al. (2013), a significant relationship was observed between all aspects of a sense of inequity and the mental health of social security workers, and the two social and economic components together explain around 13% of the mental health of women working in social security [17].

Little research has been conducted-directly investigate the relationship between socioeconomic status and reproductive health in women, especially in Iran. As a result, this study was conducted-determine the predictive influence of socioeconomic status on reproductive health in Ardabil women aged 35-70 years, provide policymakers with unequivocal data-improve women's reproductive health.

## 2. Methods

A prospective Persian cohort study was conducted among 21000 people from May 2017 to March 2020 in Ardabil City. More than 9000 women (35-70 years) completed a questionnaire including reproductive history under the supervision of experts. The inclusion criteria included the age of 35-70 years and residents of Ardabil.

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A cross-sectional study was conducted based on the Ardabil Persian cohort study in March 2020. Systematic random sampling was performed. The sample size was calculated using Cochran's method with an error rate of 0.05 and a population of 9,000 people, and 368 women were included in the study. All information (types of cancer, housing, number of bedrooms, family assets, domestic and foreign travel, number of books read, income, employment, and education) was collected from the Ardabil Persian Cohort study using a checklist based on the study's objectives. The checklist was designed in three sections, first demographic data, including age, marital status (single/married/divorced/other), an education level (from illiterate-academic degree), body mass index (BMI), occupation (unemployed/official employee/teacher/manual employee/self-employee/medical staff), and having chronic diseases (diabetes/hypertension/cardiovascular disease). The second part of the checklist included data about reproductive parameters status, including having a history of tubectomy (yes/no), hysterectomy (yes/no), normal menopause (yes/no), hormonal replacement therapy (HRT) (yes/no), cervical or breast cancer screening (yes/no), breast exam (yes/no), mammography (yes/no), pap smear (yes/no). The third part of the checklist focused on socioeconomic-related factors, where participants were asked about items (having a car, wash machine, home ownership, number of rooms, family size, traveling, and income level). Based on the third part of the checklist and using the principal component analysis (PCA) technique [18], factors were calculated for participants and were defined from poorest-richest in 5 levels.

Finally, all of the data was entered and analyzed using SPSS software, version 21. The distribution of the studied variables was approximated using dispersion statistics, and logistic regression and multivariate regression tests were performed on the analytical data.

The information gathered was kept secret, and all ethical standards were observed in its use. The Ethics Committee at Ardabil University of Medical Sciences approved the study (Code: IR.ARUMS.REC.1399.186).

## 3. Results

The mean age of the women was 56.47±0.65 years. According-the findings of this survey, 86.7% were married, 44% were illiterate, 80.4% were housewives, and 57.3% were obese. Furthermore, 6% had a hysterectomy, 28.8% had a tubectomy, 6.1% had a stillbirth, 39.8% had a mammography history, 73.1% had a history of breast and cervical cancer screening, 40.1% had a breast checkup, and 86.6% had a pap smear test (Table 1).

In terms of different reproductive health parameters, Figure 1 indicates the percentage of women participating in the research at five socioeconomic levels. The findings show that the higher a woman's socioeconomic level, the less likely she is-experience reproductive health problems, such as infertility, tubectomy, abortion, stillbirth, atypical menopause, and hysterectomy. For example, the abortion rate among the poorest women was more than 40%, but it was less than 30% among wealthy women.
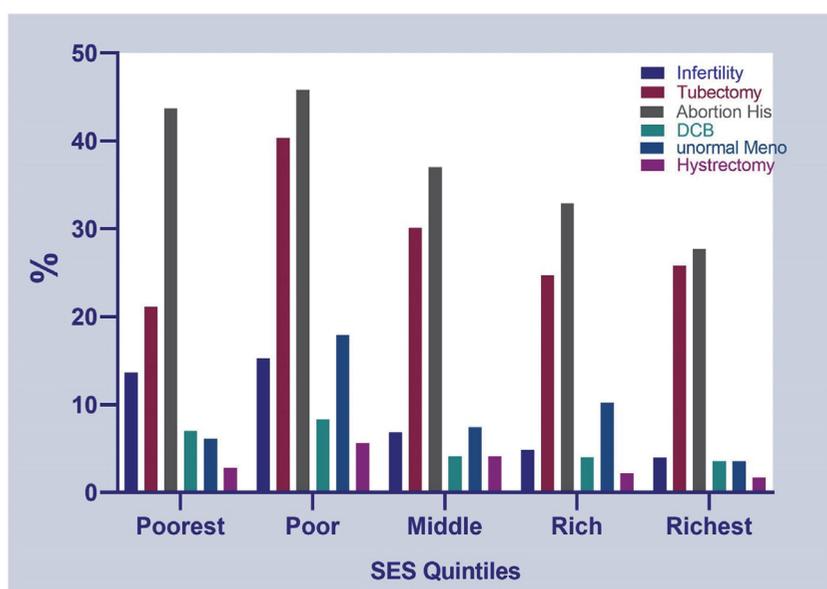


**Figure 1.** Prevalence of different reproductive health parameters based on socioeconomic status, from the poorest-the richest people

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**Table 1.** Demographic characteristics and history of women's reproductive health

| Variables | | No. (%) |
|---|---|---|
| Age (y) | 35-39 | 81(22.0) |
| | 40-44 | 53(14.4) |
| | 45-49 | 70(19.0) |
| | 50-54 | 65(17.7) |
| | 55-59 | 48(13.0) |
| | 60-64 | 36(9.8) |
| | 65-70 | 15(4.1) |
| Marital status | Single | 3(0.8) |
| | Married | 319(86.7) |
| | Divorced | 35(9.5) |
| | Other | 11(3.0) |
| Education | Illiterate | 162(44.0) |
| | Primary | 85(23.1) |
| | High school | 38(10.3) |
| | Diploma | 50(13.6) |
| | Academic | 33(8.97) |
| Chronic disease | Diabetes | 341(10.9) |
| | Hypertension | 504(16.1) |
| | Cardiac Ischemic | 348(11.1) |
| Occupation | Unemployed/housewife | 296(80.4) |
| | Official employee | 6(1.7) |
| | Teacher/professor | 16(4.3) |
| | Manual worker | 5(1.4) |
| | Self-employed | 39(10.60) |
| | Medical staff | 6(1.6) |
| BMI | Underweight | 6(1.6) |
| | Normal weight | 34(9.2) |
| | Overweight | 117(31.8) |
| | Obesity | 211(57.3) |
| Stillbirth | No | 339(93.9) |
| | Yes | 22(6.1) |

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| Variables | | No. (%) |
|---|---|---|
| Tubectomy | No | 262(71.2) |
| | Yes | 106(28.8) |
| Hysterectomy | No | 346(94.0) |
| | Yes | 22(6.0) |
| Normal menopause | No | 59(16.1) |
| | Yes | 309(83.9) |
| Hormonal replacement therapy | No | 3(0.8) |
| | Yes | 365(99.2) |
| Cervical or breast cancer screening | No | 99(26.9) |
| | Yes | 269(73.1) |
| Breast exam | No | 220(59.9) |
| | Yes | 148(40.1) |
| Mammography | No | 222(60.2) |
| | Yes | 146(39.8) |
| Pap smear | No | 49(13.4) |
| | Yes | 319(86.6) |

BMI: Body mass index.

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Table 2 lists the factors that lead-poor reproductive health in women. Women were divided into two groups based on their reproductive status and history, women with good reproductive health and women with poor reproductive health. Women with a history of hysterectomy, miscarriage, more than one abortion, or use of fertility medicines were defined as having poor reproductive health, while women with none of the aforementioned were classed as having good reproductive health. The table below examines the probability of women having poor reproductive health in terms of socio-economic status. For example, the findings reveal that the chances of poor reproductive health increased with age, that the risks of poor reproductive health were higher in illiterate people than in educated people, and that the chances of normal reproductive health improved with rising levels of education. The most notable result of the study was the inverse relationship between poor reproductive health chances and women's socioeconomic status, which indicated that the possibilities of poor reproductive health were much lower in rich women than in poor women.

## 4. Discussion

According-the findings of this study, infertility, tubectomy, abortion, stillbirth, atypical menopause, and hysterectomy were all less prevalent among women with higher socioeconomic status.

Consistent with our findings, Barman et al. (2020) discovered that women's education had a positive and highly significant association with their use of maternity and child health services in India. Similarly, educated women received more prenatal care, delivery care, and postpartum care than illiterate women [10].

Another study on the health conditions of women living in slums, conducted by Kaviarasu et al. (2015), found that the unhygienic environment of slums and the basic facilities of non-standard settlements jeopardize the health and well-being of all inhabitants, particularly women. These women had poor reproductive health as a result of an unhealthy diet, early marriage and childbirth, and inadequate time between pregnancies [19]. This study's findings were consistent with the current study's findings, which indicated that women with poor socioeconomic status had higher rates of infertility, tubectomy, abortion, stillbirth, atypical menopause, and hysterectomy.

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**Table 2.** Multivariable logistic regression model for the association between socio-demographic factors and women's weak reproductive health

| Socio-demographic Factors | | Odds Ratio | | | |
|---|---|---|---|---|---|
| | | Crude (95% CI) | P | Adjusted (95% CI) | P |
| Age | 35-39 (ref.) | 1 | - | 1 | - |
| | 40-44 | 1.04(0.86-1.56) | 0.102 | 1.06(0.87-1.48) | 0.220 |
| | 45-49 | 1.2(0.90-1.85) | 0.089 | 1.36(0.96-1.79) | 0.091 |
| | 50-54 | 1.95(1.20-2.71) | 0.041 | 1.68(1.25-1.93) | 0.024 |
| | 55-59 | 2.16(1.89-3.31) | <0.001 | 1.85(1.43-2.82) | <0.001 |
| | 60-64 | 2.03(1.67-2.84) | <0.001 | 1.98(1.52-2.20) | <0.001 |
| | 6570- | 2.45(2.02-3.26) | <0.001 | 2.14(1.71-2.84) | <0.001 |
| Marital status | Single (ref.) | 1 | - | 1 | - |
| | Married | 2.13(1.46-3.11) | <0.001 | 2.60(1.51-4.46) | 0.001 |
| | Divorced | 1.02(0.35-1.88) | 0.112 | 1.09(0.44-1.77) | 0.124 |
| | Other | 0.89(0.51-1.75) | 0.774 | 1.44(0.69-2.70) | 0.291 |
| Education | Illiterate (ref.) | 1 | - | 1 | - |
| | Primary | 1.32(1.19-1.46) | <0.001 | 0.81(0.71-0.91) | 0.001 |
| | High school | 1.49(1.33-1.67) | <0.001 | 0.73(0.63-0.84) | <0.001 |
| | Diploma | 0.65(0.43-0.92) | 0.014 | 0.57(0.42-0.73) | <0.001 |
| | Academic degree | 0.41(0.13-0.83) | 0.001 | 0.50(0.40-0.64) | <0.001 |
| Occupation | Unemployed (ref.) | 1 | - | 1 | - |
| | Official employee | 0.28 (0.11-1.15) | 0.377 | 0.22(0.08-1.05) | 0.302 |
| | Self-employed | 0.60 (0.49-1.05) | 0.714 | 0.58(0.38-1.13) | 0.615 |
| | Retired | 1.23 (1.08-1.98) | 0.041 | 1.48(1.12-2.02) | 0.019 |
| BMI | Normal weight (ref.) | 1 | - | 1 | - |
| | Underweight | 0.89(0.53-1.48) | 0.663 | 0.83(0.48-1.46) | 0.532 |
| | Overweight | 1.71(1.13-2.78) | 0.004 | 1.64(1.15-1.94) | 0.005 |
| | Obesity | 1.67(1.16-2.25) | <0.001 | 1.83(1.23-2.34) | 0.004 |
| Socioeconomic quintiles | Poorest (ref.) | 1 | - | 1 | - |
| | Poor | 1.01(0.90-1.14) | 0.32 | 0.97(0.85-1.10) | 0.680 |
| | Middle | 0.88(0.79-0.96) | 0.025 | 0.85(0.71-0.95) | 0.008 |
| | Rich | 0.72(0.64-0.82) | <0.001 | 0.66(0.59-0.81) | <0.001 |
| | Richest | 0.71(0.40-0.84) | <0.001 | 0.66(0.58-0.82) | <0.001 |

CI: Confidence interval; BMI: Body mass index; ref: Reference group; MA: Master of sciences.

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Furthermore, Vincent et al. (2021) demonstrated in their qualitative study that socioeconomic status is still one of the vital factors affecting women's reproductive health in Nigeria, where the process of reducing maternal and child mortality is slow and factors, such as age, education, material, and human capital, economic-financial inequality, and men's participation in reproductive health activities were deemed effective in the reproductive health of women [20].

Gartner et al. (2021) discovered that the rate of hysterectomy was higher in areas with higher socioeconomic levels, the main cause of which is unknown, but may be due-the higher proportion of blacks in these cities than whites [21]. This outcome contradicts the present inquiry's results. Moreover, the findings of a study conducted in the United States by Beshar et al. (2021) suggest that sterilization methods are lower in women with a university degree, a high income, and who live in cities than in other women [22].

Sharafi et al. (2021) revealed that socioeconomic inequality has a significant impact on most noncommunicable diseases in the region, including infertility and breast cancer, and these diseases are concentrated among the poorest people, based on data from the Persian Cohort of Hormozgan Province, Iran [23]. This is consistent with the findings of the current investigation. According-Zou et al.'s (2021) research on immigrant women, work and money have a significant influence on the menopausal period. Stable employment and a steady income are two benefits that can ease a woman's menopause by reducing financial stress [24]. Poor socioeconomic status, in general, is related-poor health outcomes in women of all ages [25]. Additionally, a constant relationship is observed between socioeconomic status and late-life health and death rates. Similarly, people with higher incomes are more likely-report excellent health and less depression [26]. Given the aforementioned problems, it is recommended that women be empowered by supporting public policies that protect women-reduce the effect of social and economic variables influencing women's health. Economic growth and support for women's investment, as well as the growth of high-wage job opportunities, all contribute-improving conditions for women [27, 28].

## 5. Conclusion

Women's health should be prioritized-attain the right-health, which is the cornerstone of society's growth and progress. Promoting women's reproductive health necessitates careful planning and preparedness. It is possible-promote the welfare and health of women, families, and society through fostering cross-sectoral collaboration and implementing government policies-empower and improve women's socioeconomic status.

### Limitations

One drawback of the current study is that the inclusion of disconcerting factors such as motivation and honesty in answering questions makes the study difficult. Furthermore, some respondents' information was improperly recorded, and the samples were later removed from the research.

## Ethical Considerations

### Authors' contributions

Conceiving the study: Afrouz Mardi; Final responsibility-submit for publication: Farhad Pourfarzi, Afrouz Mardi, Telma Zahirian and Hamed Zandian; All authors read and amended drafts of the paper and approved the final version.

### Conflict of interest

The authors declared no conflict of interest.

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