



Do Educated Women Have More Sexual Satisfaction? A Systematic Review Study

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Abstract

Objectives: Educational status affects all aspects of life, including sex life. Regarding the relationship between women's sexual satisfaction and their education level, contradictory results have been obtained so far. This systematic review aimed to summarize the existing knowledge in this area.

Methods: In this study, three electronic databases, including PubMed, Scopus, and Web of Science were searched for all the related articles published from 1 January, 2000 to 28 June, 2022. The MeSH keywords including "educational status", "education", and "sexual satisfaction" were combined with Boolean operators of AND and OR. There were no geographical constraints in this study. Inclusion criteria were all observational articles evaluating the relationship between the educational status of heterosexual, non-pregnant, and non-sick women with sexual satisfaction. The quality of articles was assessed by the Newcastle-Ottawa scale (NOS) and the data were analyzed qualitatively.

Result: Out of a total of 4984 retrieved articles, nine studies with a sample size of 10488 women were included in this systematic review (2003-2021). In subjects with sexual dysfunction and mental health problems, as well as those affected by economic pressure, sexual satisfaction was predicted by the mentioned factors and not by the education level. Generally, in the studies where it was possible to compare the participants with all levels of education (illiterate to academic) and there was no sexual dysfunction, mental health problems, and economic pressure, women's level of education was the predictor of their sexual satisfaction.

Conclusions: According to our results, education was the most effective predictor of women's sexual satisfaction in stable conditions without sexual dysfunction. Education can improve women's educability, knowledge, and attitudes towards sexual issues, thereby increasing their sexual satisfaction. However, for a more definite conclusion, high-quality and larger studies are needed to measure the relationship between sexual satisfaction and women's education.

Keywords: Sexual satisfaction, Educational level, Systematic review

Introduction

Sexual health and the resulting satisfaction can positively predict health outcomes (1). Sexual satisfaction is a domain of life satisfaction, so that people with high sexual satisfaction enjoy more subjective well-being (2). It is defined as the emotional response resulting from the subjective evaluation of the individual and the positive and negative dimensions of their sexual relationship with another person (3). Sexual satisfaction is influenced by many demographic, physio-pathological, psychological, socioeconomic, and cultural factors (4-6).

Most people believe that sexual satisfaction is correct sexual function and behavior whose final result is satisfaction and orgasm (7). Being influenced by cultural settings, sexual behavior requires dynamic behavioral adaptation. Thus, to guarantee both features, a multisystem and complex interaction of the brain is needed. The neural structures involved in sexual behavior are located both in the central and peripheral parts of the nervous system. The recognition of multidimensional sexual stimuli includes sensory processing that, being integrated

with experiences, produces autonomous and appropriate motor responses under a dominant cognitive control (8).

Facing pregnancy, postpartum period, menopause, and reproductive diseases (such as infertility, pelvic floor fractures and disorders, genital tract infections), cancers, and other chronic diseases, women report a decreased sexual satisfaction caused by sexual dysfunction, increased anxiety, depression, communication and emotional problems with sexual partners, decreasing self-confidence, and changing sexual attitudes (9-14).

One of the most important factors influencing the formation of women's attitudes and ideology is their educational status (15). Contradictory results have been reported in studies investigating the impact of women's education on their sexual satisfaction. Women's education enhances household decision-making powers with regard to financial and non-financial issues, and has a positive effect on sexual satisfaction by reducing relational friction (16). Moreover, academic education can increase women's emotional, cognitive, and rational skills in facing life problems, as acquisition of knowledge improves sexual

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satisfaction of women by enhancing their intellectual capacities and awareness, communication, and marital skills (17). Engagement of more educated people in thinking and studying makes them look for solutions to their problems more easily, which results in enhanced self-esteem, thereby improving sexual satisfaction (18). However, the sense of worthiness, created in more educated women through their improved access to information and awareness of their rights, changes their attitude towards gender norms in such a way that they can no longer tolerate domestic violence (19). Accordingly, women with higher education levels report more domestic violence (20), which affects their sexual satisfaction (21).

Higher education makes women succeed in the labor market. Job satisfaction and security together with improved economic conditions can increase sexual satisfaction, whereas stress and job burnout, exhaustion, occupational conflicts, having a lower income than that of one's husband, and tangible and intangible sexual violence in the workplace can decrease women's sexual satisfaction (16,22,23).

In a systematic review, Rausch et al investigated the factors predicting women's sexual satisfaction from 2004 to 2019. Regarding the relationship between education and sexual satisfaction, five articles with contradictory results were found (6); two studies reported no correlation (24,25), one study reported a positive correlation (26), one study reported a slight positive correlation (27), and one study reported a negative correlation (28). Given these contradictory results, the present systematic review examined the related articles published from 1 January, 2000 to 28 June, 2022 to summarize the existing knowledge in this area.

Methods

In this study, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were observed. PRISMA consists of 27 items associated with the content of a systematic and meta-analysis, and includes abstracts, methods, results, discussions, and financial resources (29).

Search Strategy

In accordance with the PECO framework (Population: heterosexual women, Exposure: educational statuses, Comparator: not applicable, and Outcome: sexual satisfaction), we systematically searched three electronic databases, including Web of Science, PubMed, and Scopus. The related keywords were extracted from the Medical Subject Headings (MeSH) database and combined with Boolean operators (AND-OR) (Supplementary file 1).

The time periods in previous systematic reviews conducted to investigate the predictors of women's sexual satisfaction were as follows: in the study by Rausch et al the time period was from 2004 to 2019 (6), in the study by Noruzi et al from 1996 to 2016 (30), in the study by

Shahhosseini et al from 1994 to 2014 (5), and in the study by Sánchez-Fuentes et al from 1979 to 2012 (31). The time period in our study was 22 years (from 2000 to 2022) and without geographical restrictions. To maximize the validity, all searches were performed by two researchers independently.

Inclusion Criteria

All observational studies (longitudinal, cohort, cross-sectional, and case-control) evaluating the relationship between sexual satisfaction and women's educational status were included. There was no language filtering. We excluded reviews, letters to the editor, conference papers, and studies with incomplete data. The participants of the selected studies were non-pregnant, healthy (without mental or physical illness), and heterosexual women without age restrictions. We selected articles reporting the level of education by a degree or average years of study. All illiterate women were excluded from the study. Sexual satisfaction had been assessed using standard or researcher-made questionnaires such as the Hudson Sexual Satisfaction (ISS-25), Larson Sexual Satisfaction (LSS), and Women's Sexual Function (WSF). Questionnaires that measured sexual function were also included in the study if they specifically reported sexual satisfaction and assessed its relationship with education level.

Selection Process

The eligibility of the articles was evaluated by two authors independently, and any disagreements were resolved by consensus. We excluded the articles whose full-texts were not available, though we contacted the authors via emails to get the full-texts. We also removed all duplicate and irrelevant articles based on eligibility criteria and study objectives. We examined the full-text articles to ensure that they were relevant. All searches were performed hierarchically by two researchers independently using the PRISMA flowchart (2020) (29). Finally, nine full-text articles were included in the systematic review (Figure 1).

Risk of Bias Assessment

The Newcastle-Ottawa Scale (NOS; adapted for cross-sectional studies) was used to assess the quality of selected studies (32). The quality assessment was conducted by two independent researchers and supervised by a third author for accuracy. Any disagreement was resolved by consensus. This tool is used to evaluate the quality of non-experimental and observational studies, and includes selection, comparability, and outcome. The maximum score is 10 and the quality of articles is scored as Good, Fair, and Poor. In this study, we only included articles with good or fair quality.

Data Extraction

For data collection, we recorded the following information: reference, NOS Score, location, population, sample size,

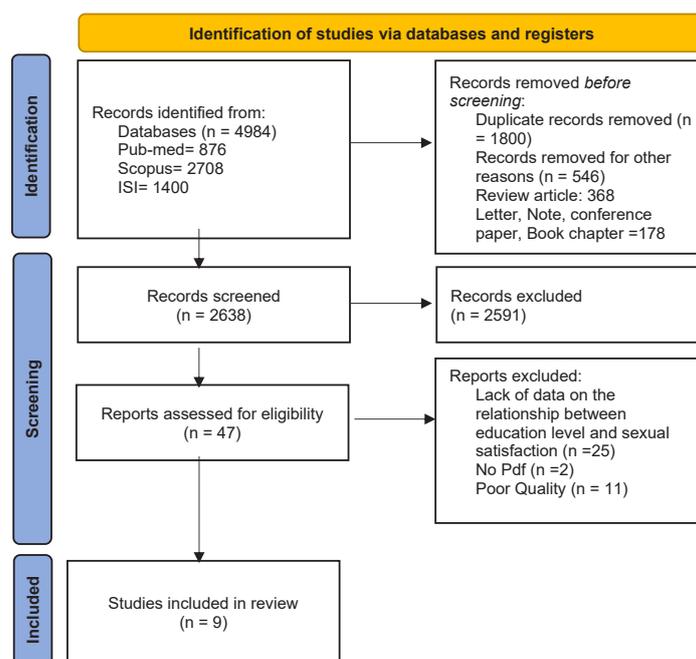


Figure 1. PRISMA Flow Diagram of the Study.

study design, questionnaire, age, level of education, sexual satisfaction, Odds Ratio, and results.

Data Analysis and Synthesis

The qualitative data of included articles is summarized in Table 1. Due to different sexual satisfaction questionnaires used in different studies and various education levels, we could not conduct a meta-analysis. Thus, we described the included studies qualitatively.

Results

Overall, 4984 studies were found via searching the mentioned databases. After excluding redundant articles (duplicated, review, letter and etc) and with Endnote X8, 2638 studies remained. After reading the abstracts of the articles, 2591 studies were excluded from this list. Then, we reviewed the full text of the remaining 47 studies, and excluded more 38 studies. Finally, 9 studies with a total sample size of 10,488 participants were included in the qualitative analysis. The flowchart of this selection process is offered in Figure 1. The studies were published during 2003–2021, and were conducted in Iran (2 articles), Spain (2 article), Egypt (one article), Israel (one article), Norway (one article), Chilly (one article), and Malaysia (one article).

All observational articles were examined in this review. The study method in all obtained studies was descriptive analytical (cross sectional) (Table 1). The majority of studies had used correlation, chi-square, one-way ANOVA and regression.

Sexual satisfaction was measured by researcher-made and standard questionnaires (Larson, Hudson, WSE,

MVFSFI). The level of sexual satisfaction in the studies included dissatisfied (33,34), moderately satisfied and dissatisfied (35), moderate (36) and highly satisfied (28, 15,37-39). The majority of the participants had primary education in two studies (35,37), secondary education in two studies (36,39), and academic education in other studies (15,28,33,40). Illiterate subjects were also examined in 4 studies (35-37,39). Three studies examined women of reproductive age (n=2878), three studies women without age limit (n=4245), one study elderly women (61-94 years) (n=109), one study women of postmenopausal age (n=3026), and in one study the majority of the participants were premenopausal women (n=230). Economic status and income level were examined in 5 studies and the majority of participants in these studies had low (40), medium to low (34), medium (15,39) and high incomes (33). In all the studies, the study population was mostly urban dwellers.

Discussion

In this study, we reviewed the results of nine studies from seven European, Asian and African countries that investigated the relationship between women's education level and their sexual satisfaction. Several factors can affect sexual satisfaction, that are sometimes more influential than women's education level. However, it is women's education level that overshadows their sexual satisfaction.

Sexual function is one of the most important predictors of sexual satisfaction (6). In the study by Barrientos and Páez, sexual function explained 91.5% of the variance. In their study, most women enjoyed high sexual satisfaction, so that a higher education level led to a higher sexual

Table 1. Overview of All Included Studies in Systematic Review

Author	NOS Score	Population	N	Questionnaire	Educational Level	Sexual Satisfaction	Or (95% CI)	Result
Omar et al (33)	Good (7)	Married men and women	Total = 696 Women=479	ISS (Hudson)	Pre-university= 3 (0.6%) University= 249 (52%) Postgraduate= 227 (47.4%)	Score=38.913.4± (72.3-12.7) No stress (<30): 131(27.3%) Stress (>30): 339 (70.8%) Severe stress (>70): 9 (1.9%)	-	The ISS total grade was not related to education status (P=0.41). Being a housewife, being over 35 years, the length of the marriage of 5-10 years, and the presence of sexual dysfunction and anxiety in women significantly predict sexual dissatisfaction.
Bahrami et al (40)	Good (8)	Married women	313	LSSQ	Non-University= 18.8% University= 81.2%	Score=96.814.68±	B=8.46 SE=2.16 β=0.16 P<0.001	The spouse's job, partner's social support, education, job, CSASC grade, age, duration of the marriage, and economic position predicted sexual satisfaction
Cornellana et al (35)	Good (8)	Postmenopausal Women	3026	WSF	Illiterate = 5.72% Primary = 36.3% Secondary = 35.83 % University = 22.15%	Dissatisfied = 10.45% Fairly Dissatisfied= 13.34 % Neither Satisfied nor Dissatisfied = 34.13 % Fairly Satisfied = 34.23 % Very Satisfied= 7.86 % Mean score = 3.16	The multivariate analysis P<0.001	Higher education, employed ore previously employed, stable partner, living in urban areas, healthy lifestyle and getting information about menopause period were indicators of sexual satisfaction in postmenopausal women.
Darooneh et al (41)	Good (8)	Married Women	200	LSSQ	13.3±2.93	99.75±13.76 High Satisfaction= 54.5%	B=-0.75 SE=0.47 β=-0.16 P=0.11	Sexual satisfaction is correlated with the age and couple's educational level, the marriage duration, financial indices, and women's income. In linear regression model there was no significant relationship between educational level and sexual satisfaction.
Ruiz-Munoz et al (37)	Good (7)	Sexually active people	Women: 2365 & men: 2532	One question: In general, how satisfied are you with the sexual life you have had?	Less than primary: 146 (6.17%) Primary: 828 (35.01%) Secondary: 709(20.97%) University: 644 (27.23%)	81.98 % Satisfy 89.40 % Satisfy 91.19 % Satisfy 92.96 % Satisfy	Adjusted OR (95% CI): 0.31 (0.18-0.53) Adjusted OR (95% CI): 0.59 (0.40-0.88) Adjusted OR (95% CI): 0.73 (0.48-1.11) Adjusted OR (95% CI): 1	The lower level of women's education was typically less sexually satisfied.

Table 1. Continued

Author	NOS Score	Population	N	Questionnaire	Educational Level	Sexual Satisfaction	Or (95% CI)	Result
Shkolnik and Iecovich (36)	Fair (6)	People 60 years and older	Women: 109 & Men: 91	ISS-25 (Hudson) by applying the changes: Total score:1-6	16 y: 124 (62.6%) 13-15 y: 20 (10.1%) 9-12 y: 44 (22.2%) 8-5 y: 9 (4.6%) 0-4 y: 1 (0.5%)	Women: 4.39±1.19	B=0.25 SE=0.09 β:0.2 P < 0.01	Sexual satisfaction was not significantly different between men and women. High level of education, increased age and being more sexually active predict sexual satisfaction in these subjects (r2=0.37). Sexual activity, education, and age were significant predictors of sexual satisfy.
Traeen (28)	Good (6)	Married Persons	797 persons Women: 386	Are you satisfied with your sex life? (1 question)	Below university 59.5%	Very dissatisfied: 10% Quite dissatisfied: 12% Neither satisfied nor dissatisfied: 20% Quite satisfied: 44% Very satisfied: 14%	X ² P<0.05	Women with university education had significantly less sexual satisfaction than those with non-university education. The lower the age of the women (under 50 years), the higher was their sexual satisfaction.
Sidi et al (34)	Good (6)	Married Women	230	MVFSFI	Higher academic 76.7% Lower academic 23.9%	Satisfaction: 88(50.3) Dissatisfaction: 87(49.7)	1	Education level had no significant relationship with sexual satisfaction. The older age of the spouse and 1-3 times sexual intercourse compared to 4-5 times per month increased sexual dissatisfaction.
Barrientos & Páez (39)	Good (7)	Sexually active people who were over 18 years old	Women: 3163 & man: 2244	COSECON questionnaire	High (12 y or more): 533 (21.1%) Middle (8-12 y): 999 (43.6%) Low (0-8 y): 2508 (31.7%) Don't know: 122 (3.5%)	Very Satisfied: 58.5% NS Very Satisfied: 26.8%	Willks Lambda: Statistics: 0.749 P<0.001	High educational level, marital and socioeconomic status were associated with sexual satisfaction in women. Also, being in love with the partner and having a steady partner were related to sexual satisfaction

ISS, Index of Sexual Satisfaction; MVFSFI, The Malay Version of Female Sexual Function Index; LSSQ, Larson sexual satisfaction

satisfaction. Sexual dissatisfaction was also significantly higher in the group with lower levels of education (0-8 years) (39). Similarly, Cornellana et al observed no sexual dysfunction in postmenopausal women, and they had a high sexual satisfaction. In this study, sexual satisfaction was higher in women with higher education (35). According to Bahrami et al, sexual dysfunctions had a low prevalence and sexual satisfaction was high in 51.4% of women, moderate in 35.5%, and low in only 13.1%. In this study, women's education level played a substantial role in explaining their sexual satisfaction (15). In the study by Ruiz-Muñoz et al, more than 90% of women were very satisfied or completely satisfied with their sexual life. This study found a significant relationship between education level and sexual satisfaction (37). By contrast, in the study by Omar et al, sexual dysfunction and sexual dissatisfaction were observed in most women. This study revealed no significant relationship between women's education level and their sexual satisfaction (33). In the study by Sidi et al, the rate of sexual dissatisfaction was 50.2%, and the participants had disorders in most domains of sexual function. Like the previous study, this study also revealed no significant relationship between education level and sexual satisfaction (34). In populations without sexual dysfunction and high sexual satisfaction, factors such as women's education level may play a significant role in explaining their sexual satisfaction; but such factors are not substantially important in subjects with sexual dysfunction and dissatisfaction.

Several studies explored the relationship between economic status and sexual satisfaction (4,41). Ruiz-Muñoz et al reported lower sexual satisfaction in women with low socioeconomic status. This study was conducted on 2365 Spanish women (age range: 16 to 44 years) and a relationship was found between education level and sexual satisfaction (37). In the study by Barrientos and Páez, most of the participants had a medium economic level (51.1%). In their study, a relationship was observed between sexual satisfaction and education level, and high socioeconomic level was correlated with high sexual satisfaction (39). Similarly, Bahrami et al conducted a study on married women of reproductive age most of whom were housewives and had a medium income level. Women's education and economic status played a crucial role in predicting their sexual satisfaction (15). Daroneh et al conducted a study on 200 women of reproductive age from Tehran (Iran) to determine how economic and demographic factors are correlated with sexual and marital satisfaction. The majority of these women enjoyed high sexual and marital satisfaction (54.5%), most of them were housewives (77%) and depended on the income of their spouses. The job of their husbands in 62% of the cases was classified as low-income. In this study, sexual satisfaction was significantly correlated with the education level of the subjects, the age of the couple, marriage duration, the property index, and the independent income of women.

However, in the regression model, only the asset index, not the education level of the women, was the predictor of their sexual satisfaction (40). Sidi et al conducted a study on 230 married women referring to primary care clinics in Malaysia. The mean age of the participants in this study was 39.2 ± 10.5 years, and they had a medium to low income and a low socioeconomic status. Because of this low financial ability, the participants could not visit private practitioners whose visiting time was more flexible. Like previous study, women's education level was not a predictor of sexual satisfaction in this study (34). Therefore, it might be said that unlike societies with middle economic status, in low-income societies, where people are under financial pressure, the education level of women does not play a role in explaining their sexual satisfaction, and the role of economic factors is more pronounced. In their systematic review, Kamalulil and Panatik observed that economic status affected people's mental health in low-income societies (42). In women belonging to low-income groups of the society, economic status can be considered a predictor of sexual satisfaction through affecting their mental health.

Mental health can prominently affect sexual satisfaction (6). Anxiety and stress can cause sexual disorders by disrupting the production of serotonin, which in turn reduces sexual satisfaction (43). Omar et al investigated the effect of COVID-19 pandemic on sexual satisfaction and reported that the majority of women were suffering from sexual dysfunction and mental health disorders during the pandemic. Anxiety and sexual function, not education level, were the most important predictors of sexual satisfaction in these women (33). Fuchs et al observed that compared to the pre-COVID-19 era, women's stress and anxiety levels increased significantly during the pandemic, and they had an impaired sexual function and sexual satisfaction during this time, which had no significant relationship with their education level (44). This indicates that COVID-19 pandemic negatively affected the mental and sexual health of women with different education levels. In other words, higher education could not protect or have a positive impact on this horrible phenomenon. Kim et al conducted a study on 15,146 Korean men and women aged over 60 years. In this study, while depression was one of the most important predictors of sexual satisfaction, education level had no significant relationship with sexual satisfaction of these women (24). Conducting a study on 3026 Spanish postmenopausal women, Cornellana et al observed that depressed women had the lowest sexual satisfaction. However, unlike Kim's study, women's higher education level was one of the substantial predictors of their sexual satisfaction. In Kim's study, the majority of women had low education (67.9% had elementary education or were uneducated), and only a very small percent of them (16.7%) had a high school diploma or higher education. However, in the study by Cornellana et al, given the existence of heterogeneity in the

level of education, it was possible to compare the subjects more accurately. In this study, receiving information and education on healthy lifestyle and menopause effectively increased the sexual satisfaction of these women; hence, it was one of the important predictors of women's sexual satisfaction. Therefore, it can be concluded that more educated people have a better comprehension of these trainings, which increases their sexual satisfaction (35).

Several studies observed that people with higher education had more sexual health literacy (awareness and correct attitude about sexual health and fertility), leading to their better sexual satisfaction (18,45,46). Change of attitude is another effect of education that may improve women's sexual satisfaction. By contrast, more educated women may become frustrated and sexually dissatisfied by recognizing their needs and not meeting them. Shkolnik and Iecovich conducted a study on 200 men and women in Israel aged over 61 years. They reported that the women's education level explained their sexual satisfaction, so that each year of increase in the education level of women increased their sexual satisfaction by 0.2 units (36). Consistent with this study, Gillespie et al indicated that their subjects (9164 men and women aged 50 to 85 years old) with higher education level had significantly higher sexual satisfaction compared to those with lower education (26). More educated people may feel less embarrassed and uncomfortable talking about their sex life than people with lower levels of education. They can share their needs and problems with their sexual partners and improve their sexual satisfaction by solving these problems. Moreover, educated people have more access to the Web and the Internet and are more able to distinguish between true and false information. In a study by Traeen, women with university education (40.41%) had lower sexual satisfaction than women with non-university education (59.58%); in this study the researchers investigated the sexual satisfaction in 797 Norwegian couples aged 18 to 67 years ($P > 0.05$) (28). In another study in Iran it was revealed that women with postgraduate education had lower sexual satisfaction than undergraduate women (47). Parish et al in China observed that perceived partner affection was lower in women with higher education, which could indirectly reduce their sexual satisfaction. In other words, they believed that they deserve more affection than women with lower education level. As such, this unmet need decreased their sexual satisfaction (25).

Limitation of the Study

Lack of access to unpublished articles and reports was one of the limitations of this study. Additionally, because of using different questionnaires and reporting various education levels in the selected studies, conducting a meta-analysis was not possible. Therefore, it is impossible to make a definite conclusion about the relationship between education level and sexual satisfaction.

Conclusions

According to our results, high education level was a predictor of sexual satisfaction in the studies where the majority of subjects did not have sexual dysfunction, mental health problems, and economic pressure, and the heterogeneity of the education level made it possible to compare the subjects. However, in most of the studies in this area, the education level of women was examined as a confounding variable, and only a limited number of large and high-quality studies specifically investigated the connection between the education level of women and their sexual satisfaction. Thus, a definitive conclusion requires further high-quality and extensive studies.

Conflict of Interests

The authors declare no conflict of interest.

Ethical Issues

This article was extracted from a doctoral thesis on reproductive health and approved by the Deputy of Research and Technology of Shahid Beheshti University of Medical Sciences (ethics code: IR.SBMU.PHARMACY.REC.1400.010).

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