

Review Paper

The Biopsychosocial Outcomes of Childlessness or Having One Child on Couple's Health: A Systematic Review

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ABSTRACT

Background: The increase in childlessness or having one child is one of the significant changes in the demographic structure, especially in developed countries. Literature review shows that having no child or only one child affects the individual's health from various perspectives.

Objectives: This study aimed to investigate the biopsychosocial outcomes of childlessness or having one child on couples' health.

Methods: In this systematic review, the research question was about the biopsychosocial outcomes of childlessness or having a single child on couples' health. A systematic literature search was done in PubMed, Scopus, Web of Science, ScienceDirect, and the Iranian database, including SID. We employed the following keywords: "Single child," "childlessness," "health outcome," and "panel study." The quality assessment of the included studies was carried out using the Newcastle-Ottawa scale (NOS) for cohort studies.

Results: Nine studies were included in this study. The results were analyzed based on the biopsychosocial perspective. From a biological perspective, women with no child or one child and those who had cesarean section showed poorer physical health scores than women with two children and vaginal delivery. Also, other studies showed the impact of childlessness on the higher probability of cardiovascular disease and mortality, metabolic syndrome, and diabetes in men. From a psychological perspective, the studies included in this field had controversial results. Most of the included studies showed that childless women or women with one child had lower scores in mental health compared to women with two children. In addition, women with a cesarean section also had poorer mental health compared to those with vaginal delivery. Also, childlessness in old adults can cause psychological effects such as less life satisfaction, feelings of more anxiety, and loneliness. From a social perspective, one study showed that childless men are different from fathers with children in terms of participation in society, income level, and life satisfaction.

Conclusions: The results of this study indicate that childless couples may have various health problems in biological, psychological, and social aspects, which, in general, negatively affect their quality of life. The results of this study can be a good resource for policymakers and health specialists to design and implement cost-effective interventions to improve fertility indicators among the Iranian population.

Key Words:

Single child,
Childlessness, Health
outcome, Panel study

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Introduction

In recent decades, the increase in childlessness or having just one child is one of the significant changes in the demographic structure, especially in developed countries [1]. In this regard, childlessness or having a single child reduces the population in developed and developing countries [2], leading to significant concerns among demographers and policymakers involved in social development [3]. From a general point of view, the increase in childlessness is the result of an individualistic and self-centered society, and this view blames childless women for the rapid population aging and the impending social decline of security systems [4]. The childless rate in Portugal and most Eastern European countries was below 10%. Also, less than 15% of women in France, Belgium, Germany, Norway, Slovakia, Slovenia, and Sweden are childless. In countries such as Austria, Italy, Finland, the Netherlands, and the United Kingdom, childless women reach over 20% [5]. In recent years, Iran has also faced the population change problem in such a way that since the 1960s, the number of births has decreased significantly [6]. There are no accurate statistics on the rate of childlessness in Iran [7]. A study of married people in Iran between the ages of 25 and 54 showed that 12.5% were childless [8]. Another study shows that voluntary childlessness among married women was 8.5% [9].

The literature review shows that reasons for childlessness in couples include involuntary causes (infertility or delayed marriage), voluntary motives (conscious decision not to have children due to social attitudes, greater participation in occupational and social activities, and women's higher education and lack of traditional attitudes regarding women's reproductive duties), or death of one or more children [10, 11]. In addition, couples' disagreements regarding childbearing and time to conceive, or infertility problems caused by postponing fertility, can affect childbearing [1]. In this regard, a study indicates that childlessness caused by the inability to have children has adverse psychological consequences on the reproductive-aged couple's mental health and requires psychological coping skills [12-14].

Literature review shows that childlessness or having one child affects the individual's health from various perspectives. From a sociological and economic point of view, childlessness, whether voluntary or involuntary, can positively impact an individual's health [15, 16]. In contrast, a study in Iran shows that having one child is associated with negative consequences for parents, including physical adverse outcomes such as increasing the risk

of breast and ovarian cancer in women; psychological outcomes such as increased stress, anxiety, and depression; and upbringing adverse events, such as increased child-centered family and decreased family cohesion [17]. Some families are unwilling to have more children due to difficulty dealing with the first child, and others due to the new conditions in their lifestyles after child-birth period. Some economic, educational, and welfare problems were other significant factors that led to the couple's unwillingness to have more children [18, 19].

The biopsychosocial model is an approach to understanding individuals' mental and physical health status through a multi-systems lens and the influence of biology, psychology, and social environment [20, 21]. Research on childlessness and having one child in families has recently increased [1]. The critical issues in this field include the social consequences of childlessness [22], consequences of childlessness in the labor market [23], and elderly period health and wellbeing [12, 24].

With the introduction of the population youth policy in Iran in recent years, the significant reduction of population growth, and the phenomenon of population aging, it is crucial to identify the consequences of having one child and no children in Iran and worldwide. The literature review shows that despite many studies on the consequences of having one child or no children worldwide, no systematic review has been found in this field. Therefore, this study aimed to assess the biopsychosocial outcomes of childlessness or having one child on couples' health.

Methods

Study design and protocol registration

This systematic review was conducted according to PRISMA (the preferred reporting items for systematic reviews and meta-analyses) statements in 2020 [25].

Following the PICO (participants, intervention, comparator, outcomes) criteria, the "participants" were childless or with one child couples; the type of "intervention" was not applicable; the "comparator" included couples with more than one child, and the "outcome" was the biopsychosocial outcomes of childlessness or having one child on couple's health status. According to the PICO components, the research question was formulated: "What are the biopsychosocial outcomes of childlessness or having one child on a couple's health?"

Before conducting this study, its protocol was registered in the [International Prospective Register of Systematic Reviews \(PROSPERO\)](#).

Search strategy and literature search

For this systematic review, authors searched [Google Scholar](#) and electronic databases such as [PubMed](#), [Scopus](#), [Web of Science](#), [ScienceDirect](#), and the Iranian database, including the [Scientific Information Database \(SID\)](#). The search was performed by two authors (Fereshteh Yazdani Fereshteh Yazdani & Marzieh Azizi) with no time and language restrictions between March 1, 2024, and April 15, 2024.

To search in the mentioned databases, first, medical subject headings were used to extract search terms as follows: ((One-child [MeSH Terms]) OR (only child [MeSH Terms]) OR (single child [MeSH Terms]) OR (childlessness [MeSH Terms]) OR (voluntary childlessness [MeSH Terms]) OR (involuntary childlessness [MeSH Terms])) AND ((outcome assessment [Title]) OR (health outcome [Title]) OR (outcome measures [Title])) AND ((panel study [MeSH Terms]) OR (cohort study [MeSH Terms]) OR (longitudinal study [MeSH Terms])). The authors searched each database according to the specific guidelines for advanced search provided by each database. In addition, all reference lists of included studies were manually searched to ensure that all additional published articles were identified. The reference manager software EndNote, version 21 was applied to manage the references and eliminate duplicate records.

Inclusion and exclusion criteria

In this systematic review, the inclusion criteria were as follows: The panel, longitudinal, and cohort studies published in scientific journals and assessed the consequences of having one child or childlessness on a couple's or parent's health from 1990 to 2024.

In contrast, published thesis or dissertation regarding this study title, studies that have been published in [Research Square](#) as preprints, abstracts of conferences indexed in databases, studies with other designs, including case reports, case series and control, letters, narrative, scoping and systematic reviews, randomized controlled trials (RCTs) and studies regarding the childlessness or having a single child with no assessment of its consequences were excluded from this study.

Quality assessment of the included studies

The Newcastle-Ottawa scale (NOS) for the cohort was used to evaluate the methodological quality of the included studies [26]. This scale includes 9 questions in three quality parameters: Selection, comparability, and outcome. Studies with 3 or 4 stars in the selection domain, 1 or 2 stars in the comparability, and 2 or 3 stars in the outcome domain have good quality. Also, if studies acquire two stars in the selection domain, one or two stars in the comparability domain, and two or three stars in the outcome domain, have considered acceptable with fair quality. Poor quality is recognized for studies with 0 or 1 star in the selection domain, 0 stars in the comparability domain, and 0 or 1 star in the outcome domain [27].

Data extraction

The title and abstracts were evaluated for relevance to our review objectives in all included studies. In relevant studies, the full text was carefully read, and if it was consistent with the review's objectives, the required information was extracted and checked by Zohreh Shahhosseini. Two authors (Fereshteh Yazdani and Marzieh Azizi) assessed each study regarding the eligibility criteria and extracted the required information. The final decision for screening was conducted according to the consultation of the corresponding author (Zohreh Shahhosseini) about any discrepancy in the screening process. The extracted data in tables include the first author, the publication year, the country, the study design, the sample size, the outcomes measure, and the main results of the studies.

Results

Search results

The search results in databases and screening processes are shown in Figure 1. The search resulted in 6365 articles. After excluding duplicate results (n=1105), 5260 articles remained. Afterward, 957 were excluded based on the screening of titles and abstracts. During the full-text review assessment, original articles except for panel, cohort, or longitudinal studies (n=2304), scoping review, narrative review, systematic review, and meta-analysis (n=214), and cohort studies that did not assess the health outcomes of childlessness or having one child (n=1741) were excluded. In addition, the reference lists of searched studies were evaluated, and 13 articles were identified. Among them, 7 articles were excluded due to the lack of assessment of the health outcomes of

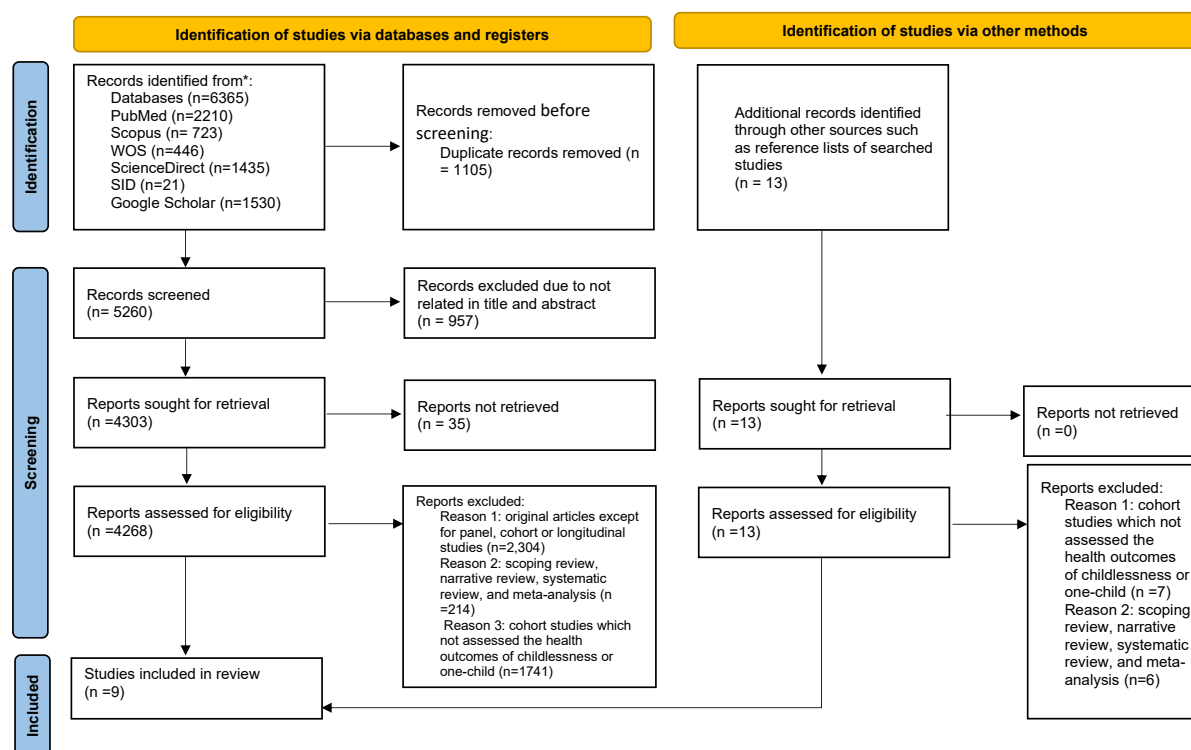


Figure 1. A Flow chart of study selection according to PRISMA guidelines

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childlessness or having one child, and 6 were reviewed. Finally, 9 studies were included in this systematic review (Figure 1).

The characteristics of the included studies

From the included studies, 2 studies were conducted in the Netherlands [12, 28]. Also, one study was conducted in China [10], one in Sweden [29], one in Denmark [30], one in Norwegian [31], one in Australia [32], one in the USA [33], and one in Hungary, Austria, Estonia, Netherlands, and Poland [34]. Eight studies were prospective cohort or population-based cohort studies, and one was a panel study. The included studies were published between 2001 and 2022 regarding the publication year.

Main results

The results have been analyzed based on the biopsychosocial perspective. As a result, the present study's findings led to classifying the results into three main categories: Biological, psychological, and social outcomes (Table 2).

Biological outcomes

Four studies assessed the biological outcomes of having one or no children on a couple's health [29, 30, 32, 34]. The results of a study conducted by Davis et al., which assessed the effect of parity and mode of birth on the quality of life of couples, show that childless women or those with one child had lower physical health status than women with two or more children. In addition, women with cesarean section(s) also had poorer health quality than women who had vaginal delivery [32]. The multi-countries study conducted by Quashie et al. shows contradictory results, so the results of a survey of Hungarian participants show no significant correlation between childlessness and poor physical health status. In contrast, childlessness in Austria, Estonia, Netherlands, and Poland show better physical health status [34]. Other studies also show the impact of childlessness on the risk of cardiovascular disease and mortality [29], metabolic syndrome, and diabetes in men [30].

Psychological outcomes

Six studies assessed the psychological effect of childlessness or having one child on a couple's health. The included studies in this field had controversial results.

Table 1. The search strategy in the included databases

Database	Search Strategy	Number of Ex-tracted Studies	Search Filters
PubMed	(((((Single child [Title/Abstract]) OR (one child [Title/Abstract])) OR (childlessness[Title/Abstract])) OR (voluntary childlessness [Title/Abstract])) OR (“involuntary childlessness [Title/Abstract]) AND (outcome assessment [Title/Abstract]) OR (health outcome [Title/Abstract]) OR (Outcome Measures [Title/Abstract]) OR (family health [Title/Abstract]) OR (mental health [Title/Abstract]) OR (physical health[Title/Abstract]) AND (panel study [Title/Abstract]) OR (panel data [Title/Abstract]) OR (longitudinal studies [Title/Abstract] OR cohort [Title/Abstract]))	2210	Text availability: Free full text Article type: Observational study Species: Human
Scopus	TITLE-ABS-KEY (single child * OR childlessness OR voluntary childlessness OR involuntary childlessness) AND (health outcome OR family health OR physical health OR psychological health OR social health) AND (panel study OR panel data OR longitudinal studies OR cohort)	723	Document types: Research articles Subject areas: Medicine Source type: Journals
WOS	“Single child” (All Fields) or “childlessness” (All Fields) and “health outcomes” (All Fields) and panel study (All Fields)	446	Document types: Article Access type: Open access
ScienceDirect	(Single child OR childless OR voluntary childlessness OR involuntary childlessness) AND (health outcome” OR physical health OR psychological health OR social health) AND (panel study OR panel data)	1435	Article type: Research article Subject area: Social sciences, psychology Access type: Open access
Google Scholar	“Single child” OR “childlessness” OR “voluntary childlessness” OR “involuntary childlessness” AND “physical health” OR “mental health” AND “panel study” OR “panel data”	1530	Year of publication: 2000-2024 Sort by relevance Keywords anywhere in the article
SID	“Single child” OR “childlessness” AND “health outcomes” AND “panel study”	21	Subject area: Medicine

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According to Davis et al.'s study, childless women or those with one child have lower mental health compared to women with two or more children. In addition, having a cesarean section leads to poorer mental health compared to vaginal delivery among women [32]. In Quashie study, there was no significant association between childlessness and poor psychological wellbeing [34]. A European survey by Huijts et al. shows that childlessness is associated with a lowered psychological sense of wellbeing among men, but this association is not significant among women [12]. Consistent with this study, the results of other studies show that women without children have lower satisfaction and self-confidence compared with mothers with children. At the same time, parental status was not related to men's psychological wellbeing [31]. According to the results of a study in China, childlessness in older adults can cause psychological effects such as less life satisfaction, feelings of more anxiety, and loneliness [10].

In contrast, another study shows that childlessness does not lead to a significantly higher prevalence of loneliness and depression in older adults with any risk factors. In other words, divorced, widowed, and unmarried childless men are significantly lonelier than women of similar status. Also, the prevalence of depression among divorced and widowed childless men was con-

siderably higher than among divorced and widowed women [33].

Social outcomes

The social outcomes of childlessness or having one child were assessed in only one study. Keizer et al. investigated the association between parental status and psychological wellbeing. It shows that childless men are different from fathers with children in terms of participation in society, income level, and life satisfaction [28].

The quality assessment of the studies

Through NOS for cohort studies, the quality of nine studies was investigated. The quality assessment results showed that 3 studies had good methodological quality [29, 30, 32], and 6 had fair quality [10, 12, 28, 31, 33, 34]. The studies' scores are presented in Table 3.

Discussion

This systematic review investigates the biopsychosocial outcomes of having one child and no children on a couple's health. Nine studies containing cohort and panel studies were included in the review. The role of voluntary childlessness in explaining this condition is unclear. It is assumed that childlessness in the past was mainly

Table 2. The characteristics of the included studies (n=8)

Author, Year, Country	Study Design	Sample size	Age Groups (y)	Outcome Measure	Main Outcome		
					Biological	Psychological	Social
Davis et al. 2022, Australia [32]	Cohort	7770 women	Not reported	To examine how parity and mode of birth were associated with later quality of life in young adult women	Compared to women with two childbirths, childless women and women with one birth had lower scores on all aspects of physical and mental health. Women with only cesarean section had poorer health than women who had vaginal delivery.	Compared to women with two childbirths, childless women and women with one birth had lower scores on some aspects of mental health.	-
Quashie et al. 2021, Mexico, Hungary, Austria, Estonia, Netherlands, Poland [34]	Cohort	109648	Not reported	To examine the relationship between childlessness due to each reason and health	There were no significant associations between childlessness and poor physical health. Childlessness may be associated with better (e.g. Mexico, Hungary) or worse health (e.g. Austria, Estonia, Netherlands, Poland) in specific contexts and for certain measures.	There were no significant associations between childlessness and poor psychological wellbeing among assessed countries.	-
Elenkov, 2020, Sweden [29]	Population-based cohort	22444 men	25-63	Male childlessness as an independent predictor of cardiovascular and all-cause mortality risk	Male childlessness predicts cardiovascular disease risk and mortality independent of other factors such as socioeconomic, behavioral, and metabolic risk factors.	-	-
Bungum et al. 2018, Denmark [30]	Population-based cohort	2572 men	Not reported	Is male childlessness associated with an increased risk of metabolic disorders such as metabolic syndrome and diabetes?	There is an association between male childlessness and a higher risk of developing metabolic syndrome and diabetes.	-	-
Huijtset al. 2013, Netherlands [12]	Cohort	24,195	>40	The relationship between childlessness and psychological wellbeing in European middle-aged and old adults	-	Childlessness is associated with lowered psychological wellbeing in men and differs between European societies. Strong social networks considerably affect childless women, and their presence benefits them.	-
Keizeret al. 2009, Netherlands [28]	Panel study	1451 men	40-59	The comparison of life outcomes among childless men and fathers	-	-	Childless men differ from fathers in terms of community involvement, income level, and life satisfaction.

Author, Year, Country	Study Design	Sample size	Age Groups (y)	Outcome Measure	Main Outcome		
					Biological	Psychological	Social
Hansen, 2009, Norway [31]	Cohort	5189	Not reported	Examines and differentiates between parental status (childless, parents with resident children, and empty-nester parents) and psychological well-being outcomes in mid-life and adults	-	Childless women report lower life satisfaction and self-esteem than both mothers with living children and mothers with empty nests. In men, parental status is not related to any aspect of well-being.	-
Zhang & Liu 2007, China [10]	Cohort	13447	Not reported	It compares older adults and parents without children and focuses on anxiety, loneliness, and life satisfaction.	-	Childless older adults are less satisfied with their lives and feel more anxious and lonelier than their parents, but they do not necessarily feel more useless.	-
Zhang & Hayward 2001, UAS [33]	Cohort	6517	Not reported	Examining the effects of childlessness on loneliness and depression level of older adults	-	Childlessness was not a significant cause of the increase in the prevalence of loneliness and depression in old adults without any risk factors. Divorced, widowed, and never-married men without children had significantly higher rates of loneliness than women of similar status. The prevalence of depression among divorced and widowed childless men was considerably higher than among divorced and widowed women.	-

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involuntary and caused by late marriage and singleness or infertility due to medical conditions. In contrast, current childlessness is primarily based on a voluntary decision not to conceive [35]. In this regard, childlessness in some societies, especially in the United States, can be the result of couples choosing to postpone childbearing to allow them to pursue other goals in life. Studies showed that these childless years create a space and an opportunity to explore social roles outside the family environment, including education, employment, and leisure [3, 36].

The results of the current study indicate that childlessness can affect people's biological health. According to the findings of this study, childlessness can increase the chances of developing metabolic diseases and diabetes. The results of a study indicate that male infertility is in-

involved in pathways of diseases, such as cancer, cardiovascular and metabolic disorders. Also, male germ cell gene mutations could lead to or contribute to infertility, metabolic diseases, and diabetes [30]. At the same time, other studies also show that the chances of developing diabetes increase in infertile men [37-40]. Also, our review indicates that childlessness increases the risk of cardiovascular diseases, which was consistent with other studies in infertile people [41-43]. In addition, childlessness raises the death rate compared to couples with children or even adopted children [44-46].

This study also investigated the psychological effects of childlessness on a couple's health status. In this regard, some of the studies indicated that 80% of infertile people had encountered some psychosexual disorders such as marital and sexual dissatisfaction, impaired per-

Table 3. Methodological quality assessment through NOS

Author, Year	Selection			Comparability		Outcome			Scoring
	Representativeness of the Exposed Cohort	Selection of the Non-exposed Cohort	Ascertainment of Exposure	Demonstration that Outcome of Interest was not Present at the Start of the Study	Comparability of Cohorts on the Basis of the Design or Analysis Controlled for Confounders	Assessment of the Outcome	Was Follow-up Long Enough for Outcomes to Occur	Adequacy of Follow-up of Cohorts	
Davis et al. 2022 [32]	a ¹	a ²	a ³	a ⁴	a ⁵	c ⁶	a ⁷	a ⁸	Good
Quashie et al. 2021 [34]	a ¹	a ²	b ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair
Elenkov et al. 2020 [29]	b ¹	a ²	c ³	a ⁴	a ⁵	c ⁶	a ⁷	a ⁸	Good
Bungum et al. 2018 [30]	a ¹	a ²	c ³	a ⁴	a ⁵	c ⁶	a ⁷	a ⁸	Good
Huijts et al. 2013 [12]	a ¹	a ²	b ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair
Keizer et al. 2009 [28]	a ¹	a ²	b ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair
Hansen et al. 2009 [31]	a ¹	a ²	b ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair
Zhang & Liu, 2007 [10]	a ¹	a ²	c ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair
Zhang & Hayward, 2001 [33]	a ¹	a ²	c ³	a ⁴	a ⁵	c ⁶	b ⁷	d ⁸	Fair

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a¹Truly representative, b¹Somewhat representative, a²Drawn from the same community as the exposed cohort, a³Secure record (e.g., surgical record), b³Structured interview, c³Written self-report, a⁴Yes, a⁵The study controls for age, sex and marital status, c⁶Self report, a⁷Yes, b⁷No, a⁸Complete follow up- all subject accounted for, d⁸No statement.

sonal and interpersonal relationships, decreased sexual desire, and adverse psychiatric disorders [47]. In addition, this study's findings align with other studies that show that childlessness is related to low mental health and psychological wellbeing [48, 49].

Studies in this area are conflicting, and other studies have shown that from the perspective of biopsychosocial, childless couples had the lowest levels of depression compared to other groups [50]. In addition, unwanted childlessness is not correlated with psychological distress for couples [51]. Contradictions in studies can be due to different cultures related to having children or other situations, such as various recreational facilities and involvement in social activities.

Another finding of this study is the effect of childlessness on social status. Based on the findings of this study,

childlessness can affect people's social participation. According to a survey, childlessness can reduce social activities and communication with family, neighbors, and society [28]. Another study found that those who never had children have smaller networks of older people than parents, partially attributed to a more limited number of relatives [52]. A study found that older people without children, regardless of marital status and gender, are just as likely as those with children to participate in community and voluntary organizations and volunteer work [53]. Consistent with the present study, based on the survey results, fatherhood encourages men to have extensive intergenerational and family interactions [54].

The limitation of this study was the low panel studies regarding childlessness or having one child couples and its effect on their health status. In addition, we could

not perform a meta-analysis due to the impossibility of data such as relative risk from included studies. The strength of this study was that it was the first systematic review of cohort and panel studies that addressed the impact of childlessness or having one child on a couple's health status.

Conclusion

This study assessed the effects of childlessness on a couple's health using a biopsychosocial approach. The study results indicate that childless couples may have various health problems in biological, psychological, and social aspects, which, in general, negatively affect their quality of life. Due to the considerable decrease in total fertility rate and population growth, the number of childless couples will increase in the future, and these individuals will be at high risk of physical, mental, and social challenges. Therefore, the results of this systematic review can be a good resource for policymakers and health specialists to design and implement cost-effective interventions to improve fertility indicators among the Iranian population. In addition, due to limited information regarding childlessness's effects on a couple's health, conducting precise studies with high-quality methodology is proposed in the future.

Ethical Considerations

Compliance with ethical guidelines

This systematic review was conducted according to PRISMA in 2020. Before conducting this study, its protocol was registered in the PROSPERO (Code: CRD42023491821).

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Authors contributions

Conceptualization and supervision: Zohreh Shah Hosseini; Investigation and writing the original draft: Marzieh Azizi and Fereshteh Yazdani; Review and editing: Roya Nikbakht and Marzieh Azizi.

Conflicts of interest

The authors declared no conflict of interest.

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