



Research article

Positive body image and childbearing intention: A cross-sectional study

Mohaddese Mortezaipoor^a, Sepideh Saeb^b, Masumeh Daliri^{c,*}^a Department of Midwifery, Qaen Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran^b Department of Allied Medicine, Qaen Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran^c Department of Public Health, Qaen Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran

ARTICLE INFO

Keywords:

Positive body image
Body appreciation
Childbearing intention
Fertility rate

ABSTRACT

Background: Childbearing plays a crucial role in population movements and one of the most important factors in societal development. Nowadays, given the decrease in fertility rates, especially in developed and some developing countries, and the multitude of factors affecting these rates, this study aims to investigate the association of positive body image and childbearing intention in Iran.

Methods: This descriptive and cross-sectional study involved all health care centers of Qaen city, eastern Iran. The list of reproductive-age women and men in each center was extracted from the Ministry of Health of Iran's database. Ultimately, 494 individuals were included in the study using available convenience sampling method. Data were collected applying demographic information questionnaire, "body appreciation scale-2 (BAS-2) and childbearing intention questionnaire. Statistical analysis was performed using SPSS.26 software.

Results: Of 494 participants in this study, 50 % were men. The average age of the participants was 32.25 years (SD = 8.02). The average age of women was higher than that of men. In this study, the mean and SDs of positive body image score and childbearing intention were 39.49 (SD = 8.14) and 2.36 (SD = 1.63), respectively. In general, a positive and significant correlation was found between age ($r = 0.126$, $p = 0.005$), income ($r = 0.137$, $p = 0.002$), physical activity ($r = 0.127$, $p = 0.005$) and positive body image ($r = 0.482$, $p < 0.001$) with childbearing intention. After categorizing childbearing intention into two groups, "less than 2 children" and "2 children and more", the results of simple regression modeling showed that age, income, physical activity, body appreciation, bachelor's education and being an employee are associated with intention to have two or more children. Using multiple logistic regression modeling, a statistically significant association was observed between the childbearing intention at an older age, (OR = 1.07, $p < 0.001$) as well as positive body image (OR = 1.20, $p < 0.001$).

Conclusions: The findings indicated a significant and positive association between positive body image and couples' fertility intention. In other words, alongside external factors, internal factors such as body appreciation can influence childbearing intention and population growth rate, which highlights the importance of considering internal factors in childbearing intention.

* Corresponding author. Qaen Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, 97619-88978, Iran.

E-mail addresses: Mohaddese.m1375@gmail.com (M. Mortezaipoor), sepidehsaeb@gmail.com, sepidehsaeb@bums.ac.ir (S. Saeb), daliri96@yahoo.com (M. Daliri).

<https://doi.org/10.1016/j.heliyon.2024.e38724>

Received 7 July 2024; Received in revised form 25 September 2024; Accepted 28 September 2024

Available online 1 October 2024

2405-8440/© 2024 Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. What is already known

- Childbearing and fertility rate are considerable factors which can affect various aspects of a society's development.
- In addition to external factors, several internal factors influence fertility intention. However, studies which were conducted about the association of body image and fertility intention are limited, especially in Iran.

2. What this paper adds

- The results of this quantitative study indicated that a positive body image can positively influence couple's fertility intention. It means that internal factors should be taken into account to balance fertility rate.
- Also, among several sociodemographic characteristics, there was a positive and significant correlation between age, income, and physical activity with childbearing intention.
- Intention to have two or more children was significantly influenced by age, income, physical activity, body appreciation, bachelor's education and being an employee. Notably, multiple logistic regression modelling showed that in this study, participants who were at an older age had more obvious intention of having children.

3. Background

Childbearing and fertility rate are considered as important phenomena in population movements and are key factors in societal development, that if the proper condition and management exist, can affect socioeconomic growth, workforce, sustainable supply of resources and even societal security [1,2].

It is evident that population and development are related in different ways, though this relationship has complexities and challenges [3]. In fact, although a country's population can influence economic growth, labor force, supply of resources and maintaining security and act as an independent factor for the growth and development of a society, this can only be achieved through effective population management [2]. Otherwise, a high population growth rate along with the lack of facilities can face the society with serious challenges. A number of these challenges include increased demand for food supplies, higher unemployment rate, pressure on the health care system, lack of educational facilities, rapid reduction of natural resources, unstable socio-economic conditions and rising poverty levels [4].

In contrast, low fertility rates and the aging of population can lead to several economical and health challenges [5].

In most countries of the world, demographic changes have led to low fertility rate, such that the total fertility rate (TFR) of the United States of America has steadily decreased from 2.12 in 2007 to 1.73 in 2018 [6]. The fertility rate in the East and Southeast Asia has decreased too [7].

Iran has experienced demographic changes as well, so that after the census of the population in 1986, due to the high population growth rate, policies were established based on family planning programs and services. These policies resulted in a significant decline in fertility rate [2] which was one of the lowest fertility rates recorded in the history of human societies, so that the censuses and population statistics showed a sharp decrease in total fertility rate from 6.2 children per woman in 1986 to 1.8 in 2011 and 1.6 in 2016 [8–10].

A population's fertility rate can be predicted by the intention of the people of that society to have children, called "childbearing intention", meaning that even if all variables and background factors are controlled, what ultimately affects the fertility behavior of people is childbearing intention [11,12]. Childbearing intention is a highly accurate predictor of fertility behaviors compared to other indicators and can lead to fertility behavior in most cases. In fact, it can be said that childbearing intention indicates planning to perform fertility behavior [13]. Globally, childbearing intention is influenced by several variables such as couples' educational and employment status, perceived social support, marital satisfaction, reproductive health education, health insurance, cultural and economic conditions, and even attitudes and normative pressure [1,14–16]. Most researches have focused on external factors such as employment status, economic status and the level of education, but internal factors have not been sufficiently considered as an important part in the context of childbearing [14,17]. Internal factors could encompass couple happiness [18], optimism [19] and their mental health [20]. Another effective internal factor is "body image" [21].

Body image is a complex and multi-dimensional concept that means a person's perceiving, thinking and feeling about himself and his body, which includes not only paying attention to the appearance self-schema, but also indicates focusing on internal-cognitive factors [22].

A positive body image, which is a part of the body image concept, means accepting, appreciating and respecting one's body even in spite of incompatibility with society's standards of beauty, as well as focusing on desirable physical and internal features and developing them.

Individuals having a positive body image recognize aspects of their body that may not conform to societal or media standards of beauty; yet, they accept and appreciate them and don't let societal standards and ideals of beauty, which are constantly changing, influence their attitude towards their body and stop them from focusing on prominent personal traits [23]. Some achievements of a positive body image consist of increased hopeful feelings and happiness and improved mental health [24,25].

It has been demonstrated that shifts in personal beliefs and attitudes towards beauty impact on fertility intentions and desires and thus, a decline in population growth rate in Iran [2]. Additionally, factors such as happiness, hope, optimism and mental health of couples can influence their intention to have children [20]. To the best of our knowledge, there are few studies conducted on the effect of positive body image and childbearing intention, especially in Iran. So, this study aims to investigate the association of positive body

image and childbearing intention.

4. Methods

4.1. Study design and participants

This cross-sectional study was carried out in the eastern region of Iran on 494 couples (247 women and 247 men) in 2022 and for a period of 4 months. The participants were selected based on convenience sampling method. The inclusion criteria consisted of having consent to participate and completing the informed consent form, Iranian citizenship and no infertility. Dissatisfaction to continue, incomplete completion of questionnaires, menopause status and the medical problems that prevent pregnancy were considered as exclusion criteria.

4.2. Data collection and questionnaires

Finally, based on inclusion and exclusion criteria, among 500 individuals, 494 participants were included in the study and analyzed. (The response rate: 98.8 %). Sociodemographic characteristics included age, gender, educational level, occupation, economic status, smoking, physical activity, spouse's educational level and spouse's occupation. Two questionnaires were provided to the participants as online and paper-based formats. The first one was the "body appreciation scale-2" questionnaire to assess positive body image. This questionnaire has 10 items and each item is assigned a score of 1 (never) to 5 (always). A higher score indicates greater body appreciation [24]. Psychometric testing results of the instrument revealed favorable validity and reliability with Cronbach Alpha values of 0.87 and 0.89 for women and men respectively [26].

Fertility intention was evaluated through the question "How many children do you intend to have?". The answer options were "I don't intend to have children", "one child", "two children", "three children" and "more than three children" [27]. This study was approved by the ethics committee of Birjand University of Medical Sciences with the approval number of IR.BUMS.REC.1402.369. Data were collected from individuals referring to the health care centers. After explaining the objectives and importance of the research, participants were convinced about the confidentiality of their information. They filled out the informed consent form and

Table 1
Sociodemographic profile and studied variables based on gender.

Variable	Gender		Total	P-Value
	Female	Male		
	Mean ± SD	Mean ± SD		
Age (years)	30.25 ± 7.33	8.20 ± 34.25	8.02 ± 32.25	<0.001
Average income (Million Rial)	80.8 ± 8.66	9.32 ± 162.9	9.88 ± 121.8	<0.001
Duration of physical activity (hour)	55.19 ± 28.64	11.00 ± 43.37	20.25 ± 49.28	<0.001
Body appreciation	38.63 ± 7.73	8.46 ± 40.34	8.14 ± 39.49	0.007
Childbearing intention	2.06 ± 1.35	2.66 ± 1.83	2.36 ± 1.63	0.002
Education				0.125
High school	24 (9.7 %)	16 (6.5 %)	40 (8.1 %)	
Diploma and advanced diploma	50 (20.2 %)	54 (21.9 %)	104 (21.1 %)	
Bachelor (BS)	132 (53.4 %)	118 (47.8 %)	250 (50.6 %)	
Master (MSc) and Doctorate (PhD)	41 (16.6 %)	59 (23.9 %)	100 (20.2 %)	
Total	247 (100 %)	(100 %)247	(100 %)494	
Occupation				*<0.001
Employee	114 (46.2 %)	126 (51.0 %)	240 (48.6 %)	
Freelance	29 (11.7 %)	96 (38.9 %)	125 (25.3 %)	
Student	50 (20.2 %)	23 (9.3 %)	73 (14.8 %)	
Unemployed	54 (21.9 %)	2 (0.8 %)	56 (11.3 %)	
Total	(100 %)247	(100 %)247	(100 %)494	
Smoking				<0.001
Yes	9 (3.6 %)	46 (18.6 %)	55 (11.1 %)	
No	238 (96.4 %)	201 (81.4 %)	439 (88.9 %)	
Total	(100 %)247	(100 %)247	(100 %)494	
Spouse's education				0.125
High school	16 (6.5 %)	24 (9.7 %)	40 (8.1 %)	
Diploma and advanced diploma	54 (21.9 %)	50 (20.2 %)	104 (21.1 %)	
Bachelor (BS)	118 (47.8 %)	132 (53.4 %)	250 (50.6 %)	
Master (MSc) and Doctorate (PhD)	59 (23.9 %)	41 (16.6 %)	100 (20.2 %)	
Total	(100 %)247	(100 %)247	(100 %)494	
Spouse's occupation				*<0.001
Employee	126 (51.0 %)	114 (46.2 %)	240 (48.6 %)	
Freelance	96 (38.9 %)	29 (11.7 %)	125 (25.3 %)	
Student	23 (9.3 %)	50 (20.2 %)	73 (14.8 %)	
Unemployed	2 (0.8 %)	54 (21.9 %)	56 (11.3 %)	
Total	(100 %)247	(100 %)247	(100 %)494	

then received the questionnaire. Each couple was assigned a unique code that could only be used once.

4.3. Statistical analysis

After collecting and reviewing the questionnaires, the data were coded and statistical analysis was performed using SPSS version 26 software. Descriptive statistical indicators such as frequency, frequency percentage, mean and standard deviation were utilized to describe the data. The Kolmogorov-Smirnov test was used to check the normality of the data. For normally distributed data, the independent *t*-test and for non-normally distributed data, the equivalent (non-parametric) test, the Mann-Whitney *U* test, was applied. The final analysis was done using logistic regression modeling.

5. Results

5.1. Sociodemographic characteristics

Table 1 shows the sociodemographic profile, body appreciation and childbearing intention scores. In total, 494 individuals were included in this study. The average age of the participants was 32.25 (SD = 8.02) years and the average age of women was higher than that of men ($p < 0.001$). The average income was 121.8 (SD = 9.88) million Rials which was about twice for men than that of women ($p < 0.001$). More than half of the participants (50.6 %) had a diploma ($p = 0.125$). 48.6 % of the individuals were employees, and smoking was significantly more common in men than in women ($p < 0.001$). The mean of body appreciation and childbearing intention score were 39.49 (SD = 8.14) and 2.36 (SD = 1.63), respectively, and both of them were higher in men than women. This difference was statistically significant ($p = 0.007$ and $p = 0.002$ for body appreciation and childbearing intention respectively). Due to the non-normal distribution of the data in the Kolmogorov-Smirnov test ($p < 0.001$), the Mann-Whitney *U* test and the Spearman correlation coefficient were used to analyze the data.

5.2. Sociodemographic characteristics and positive body image score

The association of positive body image score and demographic variables are summarized in Table 2. In general, there was no significant linear correlation between age and positive body image ($P > 0.05$). Although a significant but weak correlation between income and physical activity with positive body image was observed ($r = 0.109$ and $p = 0.015$ for income and $r = 0.113$ and $p = 0.012$ for physical activity), these results were not the same in both genders. Only the age variable in women had a negative and significant correlation with body appreciation score ($r = 0.211$, $p = 0.001$), while this correlation was not seen in men ($p > 0.05$). Other

Table 2

The association of positive body image score and demographic variables based on gender.

Variable	Gender		Gender	
	Female		Male	
	Mean \pm SD	P-Value	Mean \pm SD	P-Value
Age	0.211-	0.001	0.068	0.285
Income	0.027	0.672	0.071	0.266
physical activity	0.247	0.092	0.059	0.335
Education		0.112		0.088
High school	36.20 \pm 7.95		37.31 \pm 8.80	
Diploma and advanced diploma	37.42 \pm 7.85		39.29 \pm 8.84	
Bachelor (BS)	39.29 \pm 7.41		41.82 \pm 7.68	
Master (MSc) and Doctorate (PhD)	39.41 \pm 8.27		39.18 \pm 9.17	
Occupation		0.029		0.058
Employee	39.08 \pm 8.00		41.53 \pm 8.28	
Freelance	36.51 \pm 7.39		39.27 \pm 8.72	
Student	41.16 \pm 6.77		36.60 \pm 8.15	
Unemployed	36.48 \pm 7.48		37.50 \pm 0.70	
Smoking		0.275		0.040
Yes	35.00 \pm 8.17		35.15 \pm 8.20	
No	38.77 \pm 7.70		40.85 \pm 8.46	
Spouse's education		0.052		0.824
High school	35.20 \pm 7.07		40.28 \pm 9.41	
Diploma and advanced diploma	37.01 \pm 8.32		40.94 \pm 7.93	
Bachelor (BS)	39.35 \pm 7.61		40.07 \pm 8.24	
Master (MSc) and Doctorate (PhD)	39.58 \pm 7.24		40.61 \pm 9.75	
Spouse's occupation		0.021		0.004
Employee	39.93 \pm 7.35		41.76 \pm 8.49	
Freelance	36.86 \pm 8.23		35.96 \pm 7.66	
Student	39.00 \pm 6.35		40.00 \pm 7.52	
Unemployed	–		40.45 \pm 9.01	
Total	38.63 \pm 7.73		40.34 \pm 8.46	0.007

quantitative variables did not show a significant relationship with body appreciation in both genders ($p > 0.05$).

Regarding educational level, there was no statistically significant relationship between the average score of positive body image in different educational groups in both genders ($p > 0.05$).

In women, the average score of positive body image in students was higher than in other occupations, and this difference was statistically significant ($p = 0.029$), but not in men ($p > 0.05$).

The mean score of positive body image in non-smokers was reported higher than smokers which was significant in men ($p = 0.040$) but non-significant in women ($p > 0.05$).

Although in women whose spouses had post-graduate education, the average score of positive body image was higher than in other educational groups, this increase was not statistically significant ($p > 0.05$). In men, there was also no difference between the score of positive body image and their spouse's education ($p > 0.05$).

In both women and men, individuals whose spouse's occupation was employee, a significantly higher average positive body image score was obtained ($p = 0.021$ and $p = 0.004$ in women and men respectively).

5.3. Sociodemographic characteristics and childbearing intention score

The statistical analysis of childbearing intention score and sociodemographic variables is reported in Table 3. In general, in this study, age ($r = 0.126$, $p = 0.005$), income ($r = 0.137$, $p = 0.002$), physical activity ($r = 0.127$, $p = 0.005$) and body appreciation ($r = 0.482$, $p < 0.001$) had a positive and significant correlation with childbearing intention. These positive correlations were observed in both men (0.588 , $p < 0.001$) and women (0.332 , $p < 0.001$).

In men, the age variable had a positive and significant correlation with childbearing intention score ($r = 0.166$, $p = 0.009$). In women, the physical activity showed such a positive and significant correlation with childbearing intention score ($r = 0.153$, $p = 0.016$), While the measured association was not significant in men ($p > 0.05$). Other quantitative variables of the study did not show a significant correlation with childbearing intention in both genders ($p > 0.05$). Regarding the level of education, the average score of childbearing intention in post graduated individuals was higher than in other groups, and this difference was statistically significant only in women ($p = 0.048$).

The results showed that the score of childbearing intention in women employees was significantly higher than in other jobs ($p = 0.030$), while this difference was not observed in men ($p > 0.05$).

Although non-smokers reported a higher average score of childbearing intention in comparison to smokers, there was no significant statistical difference between the two groups ($p > 0.05$).

Individuals whose spouses had post-graduate education obtained higher childbearing intention score. However, this difference was not statistically significant in both men and women ($p > 0.05$). But spouse's occupation showed a significant difference. In both groups

Table 3

The association of childbearing intention score and demographic variables based on gender.

Variable	Gender		Gender	
	Female		Male	
	Mean \pm SD	P-Value	Mean \pm SD	P-Value
Age	0.028	0.660	0.166	0.009
Income	0.079	0.219	0.086	0.177
physical activity	0.153	0.016	0.008	0.895
Education		0.048		0.361
High school	1.79 \pm 1.38		2.31 \pm 1.49	
Diploma and advanced diploma	1.70 \pm 1.34		2.50 \pm 1.91	
Bachelor (BS)	2.13 \pm 1.24		2.57 \pm 1.69	
Master (MSc) and Doctorate (PhD)	2.43 \pm 1.59		3.10 \pm 2.07	
Occupation		0.030		0.069
Employee	2.30 \pm 1.40		2.91 \pm 1.82	
Freelance	1.62 \pm 1.08		2.50 \pm 1.83	
Student	1.86 \pm 1.37		2.17 \pm 1.77	
Unemployed	1.98 \pm 1.31		1.00 \pm 0.01	
Smoking		0.378		0.783
Yes	2.00 \pm 2.29		2.63 \pm 1.98	
No	2.06 \pm 1.31		2.67 \pm 1.80	
Spouse's education		0.077		0.567
High school	1.86 \pm 1.18		2.48 \pm 1.96	
Diploma and advanced diploma	2.01 \pm 1.52		2.48 \pm 1.91	
Bachelor (BS)	1.87 \pm 1.15		2.70 \pm 1.73	
Master (MSc) and Doctorate (PhD)	2.55 \pm 1.52		2.91 \pm 2.00	
Spouse's occupation		0.017		0.004
Employee	2.20 \pm 1.33		2.94 \pm 1.66	
Freelance	2.04 \pm 1.36		1.93 \pm 1.93	
Student	1.40 \pm 1.29		2.63 \pm 1.97	
Unemployed	–		2.56 \pm 1.88	
Total	2.06 \pm 1.35		2.66 \pm 1.83	0.002

of women and men, people whose spouse's occupation was an employee had a higher average score of childbearing intention than others ($p = 0.017$ and $p = 0.004$ for women and men respectively).

5.4. Regression modeling

Finally, the child bearing intention variable was classified into two groups, "less than 2 children" and "2 children and more". In the univariate regression modeling, age, income, physical activity, body appreciation, bachelor's degree and being an employee were associated with intention to have "2 children and more". The results of multiple logistic regression modeling showed that age and positive body image influence couples' childbearing intention in such a way that after controlling of other variables in the model, the chances of having two children or more in older individuals was 7 % more than younger people, which was statistically significant ($p < 0.001$). Also, by controlling the effect of other variables, the chance of having two or more children in people with a higher positive body image score was 20 % higher than people who had lower body appreciation ($p < 0.001$). The regression modeling results are shown in Table 4.

5.5. Multiple regression modeling based on gender

Table 5 presents the results of multiple regression modeling based on gender. According to these results, in women, age, positive body image, and occupation were related to having two or more children, so that after controlling other variables in the model, the chance of having two or more children in older women was 6 % higher than in younger ones, which was statistically significant ($p = 0.004$). Also, by controlling the effect of other variables, the chance of having two or more children in women who obtained a higher positive body image score was 15 % greater than women with a lower score ($p < 0.001$). On the other hand, statistical analysis suggested that the chance of having two or more children in employed women was 3.19 times that of women who were unemployed ($p = 0.042$).

For men, age and positive body image remained as statistically significant variables in the model, so that after controlling other variables, the chance of having two or more children was 10 % higher in older people than in younger ones ($p = 0.005$). In a similar way, men who had higher positive body image scores were 27 % more likely to have two or more children in comparison to men who had lower scores ($p < 0.001$).

6. Discussion

Fertility reduction is known as a global health concern [20]. This study was conducted with the aim of determining the relationship between positive body image and childbearing intention in women and men at reproductive age in eastern Iran. In this study, the

Table 4
Multiple logistic regression modelling to investigate the factors related to childbearing intention.

Variable	univariate analysis			Multiple Analysis		
	OR	95%CI	P-value	OR	95%CI	P-value
Age	1.03	1.01–1.06	0.007	1.07	1.01–1.04	<0.001
Income	1.02	1.00–1.04	0.020	–	–	–
physical activity	1.02	1.01–1.04	0.005	–	–	–
Body appreciation	1.18	1.14–1.22	<0.001	1.02	1.16–1.24	<0.001
Education						
High school	1					
Diploma and advanced diploma	1.09	0.52–2.28	0.817	–	–	–
Bachelor (BS)	2.06	1.03–4.09	0.039	–	–	–
Master (MSc) and Doctorate (PhD)	1.57	0.73–3.34	0.241	–	–	–
Occupation						
Unemployed	1					
Employee	2.07	1.12–3.83	0.019	–	–	–
Freelance	1.07	0.56–2.05	0.829	–	–	–
Student	0.87	0.34–1.87	0.716	–	–	–
Smoking						
Yes	1					
No	1.37	0.77–2.45	0.281	–	–	–
Spouse's education						
High school	1					
Diploma and advanced diploma	0.94	0.44–2.03	0.894	–	–	–
Bachelor (BS)	1.20	0.59–2.24	0.611	–	–	–
Master (MSc) and Doctorate (PhD)	1.40	0.63–3.10	0.397	–	–	–
Spouse's occupation						
Unemployed	1					
Employee	1.54	0.79–2.29	0.203	–	–	–
Freelance	0.62	4.31–1.23	0.623	–	–	–
Student	0.64	0.30–1.35	0.245	–	–	–

Table 5
Multiple logistic regression modelling to investigate the factors related to childbearing intention by gender.

Variable	Female			Male		
	OR	95%CI	P-value	OR	95%CI	P-value
Age	1.06	1.02–1.11	0.004	1.10	1.03–1.18	0.005
Body appreciation	1.15	1.10–1.21	<0.001	1.27	1.19–1.36	<0.001
Spouse's education						
Unemployed	1					
Employee	3.19	1.04–9.79	0.042	–	–	–
Freelance	0.26	0.06–1.04	0.058	–	–	–
Student	1.72	0.50–5.90	0.387	–	–	–

average age of the participants was 32.25 years, the average age of women was higher than that of men ($p < 0.001$) and most of the participants had a diploma and were employees. Men's income was about twice as much as women's ($p < 0.001$), and smoking was reported more among men ($p < 0.001$).

6.1. Positive body image and childbearing intention in women vs. men

The results of our study showed that the average score of positive body image in participating men was significantly higher than that of women ($p = 0.007$). This finding is consistent with the results of other studies that stated that gender (male gender) can play an important role in improving the positive body image score [28–30]. A positive body image means accepting all the distinct and different characteristics of people, and various internal factors such as self-esteem, positive thoughts and feelings also affect it.

Although nowadays, lifestyle changes and more focus of society and the media on beauty standards and social comparisons have impacted men's positive body image too, the greater social pressure and media emphasis on women's beauty standards have led that negative effects of these comparisons are more obvious in women. A higher positive body image is reported in men, because society expects more beauty from women than men [28]. In Iran, due to cultural issues and societal expectations, women are influenced by imposed beauty standards, despite having high existential values, suitable social and occupational positions and also being socially active, and thus do not have a special sense of appreciation towards themselves [31,32].

Similar to positive body image score, in current study, the average score of childbearing intention was reported significantly higher in male participants than in females ($p = 0.002$), which confirmed the results of Hashemzadeh's and Yan's studies in Iran and China respectively [20,33]. In traditional societies such as some regions in Iran, men are less involved in household and child training affairs and they emphasize the role of women alone in raising children. For this effective reason, women are less willing to have children [31]. Although, today, the presence and role of women in Iranian society has become much more prominent than before, traditional gender attitudes still remain partially strong. This has increased women's concerns [31] which could play an important role in reducing childbearing intention in females compared to males.

6.2. Sociodemographic characteristics and positive body image

In the present study, the demographic factors that had an impact on positive body image in both men and women included spouse's occupation, income level, and physical activity ($p = 0.004$). So, in participants whose spouse's occupation was the employee, who had a higher level of income and more physical activity, positive body image was also higher. This finding was consistent with Shang's study, which stated that a high positive body image can be related to having a job, a high income and more physical activity [34]. However, another research found that demographic factors such as income and occupation to be ineffective in positive body image [35].

It was found that with the increase in positive body image score, the consumption of tobacco also decreases [36]. We got the same results only in male participants ($p = 0.040$) and this relationship was not established in women. Since a positive body image means loving oneself and respecting and honoring the body for its health and unique function, people with a positive body image may have more desirable physical and mental health and therefore, they think about their physical and mental health and try to improve them in order to flourish their existential values [23,25] which the results of this study also confirmed this point.

About the role of age, a negative and significant relationship of age in female participants with a positive body image score ($p = 0.001$) has been indicated in this study. As the female participants get older, the positive body image decreases. By reviewing other studies, it was found controversial results. Our findings are aligned with the results of Tylka et al. [37,38], but are not consistent with Quittkat's study, which states that positive body image score has a positive and direct relationship with women's age [39]. It may be due to the differences in studied societies such as cultural differences. The findings of the current study can be interpreted as that with increasing age and physical changes related to aging and decreasing physical performance, especially after menopause, women have distanced from the ideal and beauty standards of society, which can have an effect on reducing positive body image [40].

In this study, there was no difference in terms of age and positive body image score in men ($p > 0.05$), which is consistent with the results of Quittkat's study, which confirmed that men's age has no relationship with their positive body image score. In fact, a positive body image is not altered throughout the male's lifespan and with his age [39]. Also, analyzed data have revealed that, in female participants, being a student compared to other occupations has a positive and significant relationship with a positive body image

score ($p = 0.001$), which is not consistent with the results of another study conducted by Khalaf et al. [41].

6.3. Sociodemographic characteristics and childbearing intention

Data obtained in this research indicated that the age of men and women has a positive relationship with childbearing intention ($p = 0.009$ for men and $p = 0.004$ for women respectively), so that as the age of the couple increases, their childbearing intention also rises. In other studies, it was also shown that age plays a significant role in childbearing intention. In fact, it could be claimed that with increasing age, people's fear of infertility also increases, and as a result, their intention to have children becomes greater. In this study, due to the traditional role of the family, relatives and friends' emphasis on couples on having children, after getting older and reaching a suitable position in terms of job and income, more couples probably want to have children [42]. It should also be noted that the age of the couple has a positive effect on childbearing intention only for the first child, but it has a negative effect on the other children, so that as the age of the couple increases, their intention to have a second child declines [20,42].

In participating women, the variable of physical activity had a positive and significant correlation with the score of childbearing intention ($p = 0.016$). In a systematic review, it was found that although people's physical health has a significant impact on childbearing intention, no significant impact has been mentioned about the role of physical activity in childbearing intention [20]. Another study also confirmed that women's physical activity has no significant effect on childbearing intention [43]. On the opposite side, in another investigation, it was concluded that due to the importance of body management in women and society's emphasis on women's thinness and fitness, the fertility intention has decreased and women with physical activity and fitness have less childbearing intention [32]. The findings of the current study were not consistent with any of those studies mentioned above. Women with high physical activity who participated in this study have more childbearing intention.

In this study, it was found that a higher level of education in women and not in men can increase fertility intention score ($p = 0.048$). These findings confirmed the results of Dommermuth and Testa's studies that higher levels of women's education in developed countries can improve their desire to have children [44,45]. One of the reasons for this finding could be an increase in family income and improvement of the quality of life. On the other hand, with an increase in women's education, their participation in the higher levels of society has increased too, which can lead to positive points for women's well-being in terms of childbearing [45]. However, the results of the current study were not consistent with the findings of another study in Iran, which stated that higher levels of education in women have changed their attitude to the traditional role of women and mothers, and it is an important factor in reducing fertility intention. On the other hand, with increased educational levels of women and involvement of them in society, women have less time for their motherhood role, which can cause a decline in their childbearing intention [46,47].

In the present study, having an employee job for women had a significant relationship with their fertility intention ($p = 0.030$). In similar studies, it was also found that a suitable job may lead to a positive effect on family income, increasing the well-being of working mothers and increasing women's participation in society. It also can be a key factor for improving fertility intention and have a positive effect on childbearing intention of working women [45]. However, the findings of Abbasi's study were different, which claimed that increasing women's participation in society leads to a decrease in their desire to have children [46]. Probably, due to economic problems, people's preference is to have a permanent job and salary (for example, employee), which is an advantage for establishing a safe situation in order to increase the number of family members and the desire to have children. On the other hand, the existence of employment laws for working women to take better care of their children and the existence of a maternity leave policy for females in Iran are probably considered as the reasons for childbearing intention among working women [46,47]. Therefore, providing appropriate conditions for pregnant women and support such as suitable maternity leave for both husband and wife can be useful.

Regarding spouse's occupation, in both groups of females and males, participants whose spouse's occupation was an employee had a higher average score of childbearing intention than others, and this difference was statistically significant in two groups ($p = 0.017$, $p = 0.004$, for women and men respectively). Similarly, Moudi et al. also showed that the spouse's occupation plays an important and influential role in childbearing intention [42]. However, some studies found that job insecurity and financial problems have only a short-term effect on childbearing intention and do not have a role as a permanent effect [48]. In fact, it can be said that having a suitable financial source is an effective factor that can increase the fertility intention in men and women and even in their children [1], so with a suitable and permanent/secure job and an appropriate and stable income, couples are more inclined to have children.

6.4. Positive body image and childbearing intention

In the present study, it was found that by controlling the effect of other variables, the chance of having two or more children was higher in individuals with a higher positive body image score than people who had a lower positive body image ($p < 0.001$). It was 15 % higher for women and 27 % higher for men.

A positive body image or body appreciation, which is defined as true love and respect of a person for oneself, makes individuals accept themselves as a distinct person in terms of shape, appearance, and body and, despite the fact that they are relatively far from the beauty standards of society, but love themselves. Also, the presence of a positive body image can make a person have a comfortable, confident and good feeling about him/herself, which is evident in his external behavior, and not only false and inappropriate data received from society do not affect his/her personality and behavior, but also the person has positive effects on society and applies this positive attitude to improve existential values [23].

The findings of the present study indicate that despite the influence of age, occupation and economic status, having a positive body image helps people to have more desire to childbearing. In fact, instead of worrying about issues such as appearance changes or economic and social challenges, people focus on their internal values, and the more attention is paid to the internal values, the more

the desire to have children increases. This finding can be a significant and effective factor especially when Iran is in a concerned situation about the level of fertility in the world.

In this regard, the results of studies in Iran showed that the more women's body management, including weight control, elective medical procedures, and the excessive importance of health and beauty care, the less desire to have children and even more childlessness. In fact, it seems that women prefer their external appearance and body over the benefits of having children and try to get the admiration and support of others by aligning their appearance with the standards of society and the environment.

Probably the main cause of this issue is the excessive emphasis of society, the media and other people on the beauty and attractiveness of women and the determination of society's expectations of women's beauty, but according to other studies, another factor that can be effective is the emphasis of culture and society on preserving the individuality of women in society. In fact, creating a modern style of women and summarizing women in beauty, education and excellent job, and negating the traditional and maternal role of women, has created a negative attitude towards childbearing and caused women to ignore their existential values. It can also cause them to feel if they have more children, they will not have good social esteem and, as a result, do not consider the role of motherhood as a value, and find themselves valuable only when they have the items mentioned above [2,21,32,49]. As in a study, women stated that although they are happy to have a child and want to experience the joy of pregnancy and birth, they are worried about the lack of support from others and feel that the society does not have a favorable attitude towards them [50]. However, another finding showed that focusing on the body and appearance does not have a significant effect on the rate of childbearing intention [51]. These differences may be because of different attitudes toward woman's body in different societies.

Although, according to studies, a woman's desire to have children has a greater effect on a couple's childbearing intention, male's intentions also have an effect on couples' reproductive behavior; but this factor is less discussed in researches [51]. In the current study, it was found that if men also have a desirable body appreciation and do not consider job, income and beauty as the only indicators of their existential values, their fertility intention also increases, which is consistent with Spéder's study [19].

7. Limitations

The small size of the studied community may affect the generalizability of the results. Apart from sociodemographic factors, this research focused on only one factor, body image, while several other internal factors such as feelings of happiness and health, satisfaction with the spouse and social support may have a role in childbearing intention. So, it is suggested that future investigations should be done on communities with a larger size of population and on other variables.

8. Conclusions

In conclusion, this study showed a positive relationship between body appreciation and the couple's childbearing intention, and considering that fewer studies have investigated the relationship between body appreciation or positive body image and childbearing intention, and on the other hand, most studies performed it only in women, our study investigated this relationship in men as well, which can be considered as one of the strengths of the present study. It is suggested that in future studies, the effects of other variables on fertility intention such as the media, courses in schools and universities etc. are investigated.

Funding sources

No external funding.

CRediT authorship contribution statement

Mohaddese Mortezaipoor: Writing – review & editing, Writing – original draft, Supervision, Investigation, Conceptualization. **Sepideh Saeb:** Writing – review & editing, Writing – original draft, Visualization, Investigation, Conceptualization. **Masumeh Daliri:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Software, Methodology, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We really appreciate the Birjand University of Medical Sciences for supporting and helping us to collect the required data.

References

- [1] Z. Oshrieh, et al., Childbearing intention and its associated factors among adolescent girls: a narrative review, Iran. J. Nurs. Midwifery Res. 25 (1) (2020) 7–11.

- [2] L.T. Fard, M. Karimi, K. Rasekh, The investigation of body management among women and its effect on their attitude toward fertility (case study: women in reproductive age jahrom), *Journal of Woman & Society* 11 (3) (2020) 47–65.
- [3] G. McNicoll, Consequences of rapid population growth: an overview and assessment, *Popul. Dev. Rev.* (1984) 177–240.
- [4] J. Van Bavel, The world population explosion: causes, backgrounds and -projections for the future, *Facts Views Vis Obgyn* 5 (4) (2013) 281–291.
- [5] D. Lee, S. Kim, K. Kim, International R&D collaboration for a global aging society: focusing on aging-related national-funded projects, *Int. J. Environ. Res. Publ. Health* 17 (22) (2020).
- [6] C.S. Hartnett, A. Gemmill, Recent trends in U.S. Childbearing intentions, *Demography* 57 (6) (2020) 2035–2045.
- [7] G.W. Jones, Ultra-low fertility in East Asia: policy responses and challenges, *Asian Popul. Stud.* 15 (2) (2019) 131–149.
- [8] M.J. Abbasi-Shavazi, P. McDonald, M. Hosseini-Chavoshi, *The Fertility Transition in Iran: Revolution and Reproduction*, Springer, Netherlands, 2009.
- [9] M. Aradmehr, Socio-demographic and religious factors affecting fertility rate among childbearing women in Easter Iran: a population-based study, *Reprod. Health* 7 (1) (2019) 1553–1559.
- [10] A. Erfani, Policy implications of cultural shifts and enduring low fertility in Iran, *Community Health* 6 (2) (2019) 112–115.
- [11] A.-K. Kuhn, H. Trappe, Easier said than done: childbearing intentions and their realization in a short-term perspective, Rostock: Max Planck Institute for Demographic Research (MPIDR working paper WP-2013-018) (2013) 225–245.
- [12] F. Khalajabadi Farahani, H. Saraie, Intention for single child among women and men on the threshold of marriage in Tehran: levels and determinants, *Iranian Population Studies* 1 (1) (2013) 61–85.
- [13] A. Dorahaki, N. Koshkaki, The effect of different components of perceived social support on fertility intention: a study on ever-married women aged 18–44 Years in the urban areas of bushehr province, Iran, *J. Sch. Publ. Health Inst. Publ. Health Res.* 19 (3) (2022) 341–352.
- [14] M. Araban, et al., Factors related to childbearing intentions among women: a cross-sectional study in health centers, Saveh, Iran, *J. Egypt. Publ. Health Assoc.* 95 (2020) 1–8.
- [15] Y. Xiong, et al., Fertility intention and influencing factors for having a second child among floating women of childbearing age, *Int. J. Environ. Res. Publ. Health* 19 (24) (2022).
- [16] A. Cooke, T.A. Mills, T. Lavender, 'Informed and uninformed decision making'—women's reasoning, experiences and perceptions with regard to advanced maternal age and delayed childbearing: a meta-synthesis, *Int. J. Nurs. Stud.* 47 (10) (2010) 1317–1329.
- [17] M. Guedes, et al., Childbearing motivations scale: construction of a new measure and its preliminary psychometric properties, *J. Child Fam. Stud.* 24 (1) (2015) 180–194.
- [18] A. Aassve, B. Arpino, N. Balbo, It takes two to tango: couples' happiness and childbearing, *Eur. J. Popul.* 32 (3) (2016) 339–354.
- [19] Z. Spéder, B. Kapitány, How are time-dependent childbearing intentions realized? Realization, postponement, abandonment, bringing forward, *Eur. J. Popul./Revue européenne de Démographie* 25 (4) (2009) 503–523.
- [20] M. Hashemzadeh, et al., Childbearing intention and its associated factors: a systematic review, *Nurs Open* 8 (5) (2021) 2354–2368.
- [21] H. Mahmoudian, M. Kochani Isfahani, S. Moqadas, Consumption of media, body management and pregnancy behavior (A study of women teachers in yasuj), *Strategy for Culture* 8 (31) (2015) 173–196.
- [22] T.F. Cash, Cognitive-behavioral perspectives on body image, *Encyclopedia of body image and human appearance* 1 (2012) 334–342.
- [23] E.A. Daniels, M.M. Gillen, C.H. Markey, *Body Positive: Understanding and Improving Body Image in Science and Practice*, Cambridge University Press, 2018.
- [24] L. Avalos, T.L. Tylka, N. Wood-Barcalow, The Body Appreciation Scale: development and psychometric evaluation, *Body Image* 2 (3) (2005) 285–297.
- [25] M.M. Gillen, Associations between positive body image and indicators of men's and women's mental and physical health, *Body Image* 13 (2015) 67–74.
- [26] M. Atari, Factor structure and psychometric properties of the body appreciation scale-2 in Iran, *Body Image* 18 (2016) 1–4.
- [27] C. Zhang, et al., Fertility intentions among young people in the era of China's three-child policy: a national survey of university students, *BMC Pregnancy Childbirth* 22 (1) (2022) 637.
- [28] J. He, et al., Meta-analysis of gender differences in body appreciation, *Body Image* 33 (2020) 90–100.
- [29] Z.H. Liu, et al., Gender differences in body appreciation and its associations with psychiatric symptoms among Chinese college students: a nationwide survey, *Front. Psychiatr.* 13 (2022) 771398.
- [30] Z.A. Soulliard, et al., Examining positive body image, sport confidence, flow state, and subjective performance among student athletes and non-athletes, *Body Image* 28 (2019) 93–100.
- [31] H. Shoraka, A. Amirakafi, B. Garrusi, Review of body image and some of contributing factors in Iranian population, *Int. J. Prev. Med.* 10 (2019) 19.
- [32] H.S. Esfandiari Hadise, The effect of body management on fertility reduction, *Ensaniportal* 3 (2020) 43.
- [33] Z. Yan, et al., Third birth intention of the childbearing-age population in mainland China and sociodemographic differences: a cross-sectional survey, *BMC Publ. Health* 21 (1) (2021) 2280.
- [34] S.-J. Yao, et al., The relationship between physical exercise and subjective well-being among Chinese junior high school students: a chain mediating model, *Front. Psychol.* 13 (2023).
- [35] H. Sharif-Nia, et al., The relationship among positive body image, body esteem, and eating attitude in Iranian population, *Front. Psychol.* 15 (2024) 1304555.
- [36] R. Andrew, M. Tiggemann, L. Clark, Predictors and health-related outcomes of positive body image in adolescent girls: a prospective study, *Dev. Psychol.* 52 (3) (2016) 463–474.
- [37] T.L. Tylka, A.M. Kroon Van Diest, The Intuitive Eating Scale-2: item refinement and psychometric evaluation with college women and men, *J. Counsel. Psychol.* 60 (1) (2013) 137–153.
- [38] T.L. Tylka, Evidence for the Body Appreciation Scale's measurement equivalence/invariance between U.S. college women and men, *Body Image* 10 (3) (2013) 415–418.
- [39] H.L. Quittkat, et al., Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan, *Front. Psychiatr.* 10 (2019) 864.
- [40] N. Erbil, Attitudes towards menopause and depression, body image of women during menopause, *Alexandria Journal of Medicine* 54 (3) (2018) 241–246.
- [41] A. Khalaf, I. Al Hashmi, O. Al Omari, The relationship between body appreciation and self-esteem and associated factors among Omani university students: an online cross-sectional survey, *J. Obes* 2021 (2021) 5523184.
- [42] T. Alizadeh, et al., Factors affecting childbearing intention in women employees in Birjand: application of the theory of planned behavior, *J. Educ. Health Promot.* 12 (2023) 446.
- [43] I. Nkrumah, et al., The relationship between pregnancy intentions and diet or physical activity behaviors in the preconception and antenatal periods: a systematic review and meta-analysis, *J. Midwifery Wom. Health* 65 (5) (2020) 660–680.
- [44] L. Dommermuth, B. Hohmann-Marriott, T. Lappegård, Gender equality in the family and childbearing, *J. Fam. Issues* 38 (13) (2017) 1803–1824.
- [45] M.R. Testa, On the positive correlation between education and fertility intentions in Europe: individual- and country-level evidence, *Adv. Life Course Res.* 21 (2014) 28–42.
- [46] M.J. Abbasi-Shavazi, Z. Khajehsalehi, An Assessment on the Impact of Women's Autonomy, Education and Social Participation on Childbearing Intention in Sirjan City, *Woman in Development & Politics* 11 (1) (2013) 45–64.
- [47] R. Khorram, et al., Factors related to women's fertility intent: a study based on the theory of rational action, *Journal of Holistic Nursing And Midwifery* 27 (3) (2017) 57–66.
- [48] F. Fiori, et al., Economic insecurity and the fertility intentions of Italian women with one child, *Popul. Res. Pol. Rev.* 32 (2013) 373–413.
- [49] Z. Kavehfiroz, B. Zare, H. Shamsedini, The effect of life style dimension on attitudes towards childbearing among married women in Tehran City, *Woman in Development & Politics* 14 (2) (2016) 217–234.
- [50] K. Jordan, R. Capdevila, S. Johnson, Baby or beauty: a Q study into post pregnancy body image, *J. Reprod. Infant Psychol.* 23 (1) (2005) 19–31.
- [51] Z. Esmaeilpour, Explanation of the cognitive community of the relationship between lifestyle with women's tendency towards childbearing, *Tobacco Regulatory Science (TRS)* (2022) 161–186.