The Relationship between Childbearing Motivations and Fertility Preferences among Female University Students

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ARTICLE INFO	ABSTRACT
Article type: Original article	***Background & aim:*** Motivation for childbearing precedes desires, the number of children, and timing of childbirth.. Consequently, alterations in motivations can influence individual desires and behaviors, especially in light of population growth policies and the importance of childbearing, making it crucial to understand fertility motivation. Therefore, this study aimed to determine the relationship between childbearing motivations and fertility preferences among female university students.

Methods: This cross-sectional study was conducted from 2020 to 2021 on 220 single female students at Mashhad University of Medical Sciences, Mashhad, Iran. Convenience sampling was used.. Data were collected using a demographic questionnaire, the Miller Childbearing Questionnaire (1995), and the Miller Reproductive Preference Questionnaire (1995). Data analysis was done using descriptive statistics, Pearson correlation, and the Kruskal-Wallis testwith SPSS statistical software (version 16).

Results: The average age of students was 24.15±2.7, and their average desire to have children was 4.46±2.52 (on a scale of 1-10). There was a strong correlation between positive motivation of childbearing and fertility preferences (P<0.01), with an average desired number of children being 2.03±1.02. The study found a significant correlation (P<0.01) between the desired number of children and the desired birth time of the first child. Among the negative motivations for childbearing, fear of parenthood and challenges of childcare were significantly associated with a lower desire for childbearing (P<0.01).

Conclusion: The strong correlation between positive childbearing motivation and fertility preferences suggests that enhancing positive motivations among young individuals prior to marriage may contribute to improving fertility rates within the community.

Introduction

Having children is the most significant component of population growth (1). The general desire and enthusiasm to have children and childbearing in human beings is a fundamental aspect of societal growth and is

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regarded as the cornerstone of sustainable development in nations with low birth rates (1-2). The motivation to start a family and have children is emphasized as the key determinant of fertility behavior and a vital component in the decision-making process for humans (3-4).

Fertility is widely recognized as the primary factor influencing population fluctuations (sex and age composition). Consequently, studies focusing on fertility are deemed more crucial than those examining other demographic phenomena (death and migration). Population growth has become a significant subject of study for numerous social science researchers, as it is considered a vital component of development. The gradual decrease in birth rate and the shift from natural fertility to controlled fertility gradually alter the population's age composition, shifting from a youthful state towards an aging population. The age pyramid of Iran's population has consistently displayed extensive fluctuations over time, indicating the presence of significant patterns throughout its history. Over the past twenty years, the shape of the age pyramid has transformed due to declining fertility rates, resulting in a depression at its base (5-6).

The data from censuses and available statistics in Iran reveal a significant decline in the total fertility rate. From around 7.7 children per woman in 1966, it dropped to 1.6 in 2011. Iran's population is expected to grow at a rate of 1% per year from 2011 to 2031 due to the sustained decrease in fertility below the replacement level of 1.2 children per woman (4). Considering the low fertility rate, the United Nations has projected three possible scenarios for Iran's future population growth. By 2051, Iran could witness one of three scenarios: negative population growth at a rate of 0.23 percent, moderate downward population growth at 0.35 percent, or positive population growth of approximately 0.89 percent (4). The future realization of one of the three population growth patterns mentioned in the country is contingent upon the fertility desires and preferences of couples who will embark on parenthood (7). In the absence of significant and feasible interventions to address the issue of declining fertility rates, the nation will encounter various difficulties, including

population aging. Consequently, there will be a decline in development indicators (8-9).

Motivation for childbearing is an intricate matter influenced by cultural, behavioral, and religious aspects. Moreover, it is subject to alterations due to demographic transition and economic and social progress (10-12). Based on the research findings Pezeshki et al. (2005) , the primary factor that holds the utmost significance in having children is the motivation for fertility. The prevailing challenge concerning fertility in the nation lies in the lack of motivation to start a family. Experts in the social and behavioral sciences have highlighted the significance of childbearing reasons. They have emphasized that motivation, as an internal force, catalyzes transforming attitudes and subsequently influences a person's behavior (13).

The initiation of parenthood serves as the initial phase, preceding both the aspirations and the specific quantity and timing of offspring (14). The study conducted by Ahmedet al. (2013) alterations in motivation lead to corresponding shifts in an individual's desires and behavior (15). Fertility motivations might be positive or negative. The various factors that drive individuals towards fertility encompass personal desires, such as the delight experienced during pregnancy, childbirth, and raising a child, adherence to traditional values, contentment derived from parenthood, the sense of necessity and continuation, and even the instrumental utilization of a child. The association between the desire for more children, the preferred number of children, and shorter intervals between their births is evident (14). The adverse factors influencing fertility encompass various reasons for not desiring a child, such as the stress experienced by parents, discomfort during pregnancy and childbirth, apprehension about parenthood, and the challenges associated with child care. The positive or negative growth pattern depends on the fertility motives (16). The current generation of young individuals is characterized by a higher prevalence of being single and a greater level of education when compared to their predecessors. Additionally, they have been extensively exposed to a wide range of media platforms and the latest communication and

information technologies. They are regarded as the driving force and influential figures in the contemporary world, assuming a central role in fostering development and shaping social dynamics (17).

The study conducted by Hosseini et al. (2013) sheds light on the relationship between having children and the attitudes and awareness of women and men. Specifically, the study examined the reproductive tendencies of Kurdish housewives in Mahabad city and found that 61.4% of the women surveyed did not wish to have children. According to this study, women's inclination to have children varies significantly depending on their socio-economic, demographic, and cultural attributes (18). In their study, Mousavi et al. (2014) examined the position and attitude towards childbearing in young families residing in Qazvin city. The findings indicated a negative attitude towards the plan for childbearing and the number of children. Surprisingly, there was no substantial difference in men's and women's attitudes regarding childbearing (19). According to the 2013 survey conducted by the Statistics Center, approximately 75% of young individuals who were about to get married expressed a strong desire to become parents, whereas 25% of them showed less enthusiasm (20). In the research conducted by Niazi et al. (2023), the motivation of students at Lorestan University of Medical Sciences to start a family was investigated. The study revealed that the average desire of students to have children was calculated as 1.42 ± 3.6 (on a scale of 1 to 10), while the average time it took for the first child to be born after marriage was 40.57 ± 25.45. Interestingly, the study referred to the moon (21). The study by Islamlou et al. (2014) in Urmia focused on the attitudes of couples who were about to get married toward fertility, taking into account the influence of the country's supportive childbearing policies. The study's results revealed that men had an average desired number of children of 1.93, while women had an average of 1.81. Regarding the desire to increase the number of offspring per the country's fertility promotion policies, it has been observed that merely 18.2% of males and 9.2% of females have expressed a strong desire to have children.

Notably, women exhibited a greater degree of hesitancy compared to men (22).

With the fertility rate in the country experiencing a significant decline, it is essential to reorient the population policy's perspective towards considering both direct and indirect factors. This strategic approach aims to promote higher fertility rates and protect the nation from any potential crisis. By gathering data on the factors that drive individuals to become parents, we can assess the current state of affairs and devise effective interventions to encourage childbirth. Additionally, this information can guide us in setting research priorities, formulating population policies, and advancing the field of family health.

Given the importance of procreation and the country's population-growth policies, there has been insufficient attention to childbearing motivation in mainstream education. Studies also show varying levels of fertility motivation across different Iranian cities, and no similar research has been conducted among unmarried students. Since students are within the typical age range for marriage and childbearing and form an educated part of society, they can play an important role in promoting a culture of childbearing and supporting the formation of healthy familiesIn light of the researcher's interests, the objective of this study is to investigate the relationship between childbearing motivations and fertility preferences and the association between these aspects among female students at Mashhad University of Medical Sciences.

Materials and Methods

This cross-sectional study, conducted between August 2021 and July 2022, investigated eligible female students from various departments of Mashhad University of Medical Sciences (nursing, midwifery, health, paramedical, medicine, dentistry, and pharmacy students) within the premises of Mashhad University of Medical Sciences and the adjacent female student dormitories. The data collection period lasted approximately six months. Sampling was done employing the convenience available method, and qualified participants were included in the study after obtaining written consent.

For sample size estimation, based on the study by Khadivzadeh et al. (2014), the mean (32.44) and standard deviation (5.23) of the Instrumental Use of Child subscale were used as reference values in the sample size calculation formula.

With a 5% error and 80% test power, a minimum sample size of 215 people was determined using an independent population average calculation. It should be noted that the sample size calculated based on the other subscales of the Miller Childbearing Questionnaire — including the joy of pregnancy, birth, and childhood; traditional view; parenting satisfaction; feeling of need and survival — was smaller, and the highest variance was observed inthis particular dimension.

$$\frac{\left(z_{1-\frac{a}{2}} + z_{1-\beta}\right)^2 (s^2)}{d^2} = \frac{(1.96 + 0.84)^2 (5.23^2)}{(1)^2}$$

Female students from Mashhad University of Medical Sciences who wished to participate in the study had to meet specific criteria. These criteria encompassed a willingness to participate, Iranian nationality, single marital status, absence of any known medical condition that makes pregnancy prohibited ((including major cardiovascular, pulmonary, renal, hepatic, hematologic, neurologic, autoimmune, and severe infectious diseases), and absence of major mental illnesses, as reported by the female students. Additionally, they needed to demonstrate a willingness to participate in the study and complete the population and family knowledge course. Throughout the study, the exclusion criteria included a refusal to continue cooperating and incomplete responses(more than 5 percent) to the study's questions. After obtaining the necessary permitions, data collection was initiated following the approval of the ethics committee. A total of 225 students were initially assessed for eligibility. Three were reluctant to participate, and 222 completed the questionnaire. Of these, 2 were excluded due to incomplete responses, resulting in a final sample of 220 students.

The data collection tools employed in this study consisted of a demographic questionnaire, Miller's childbearing questionnaire, and the Miller Reproductive Preference Questionnaire. All questionnaires were completed using self-report method in the presence of the researcher, and the process took about 15 minutes in total.

The childbearing questionnaire developed by Miller comprises a total of 49 items. Since the questionnaire is divided into two parts and the scores from the positive and negative motivations subsets cannot be merged, each participant is assigned two distinct scores. Positive motives for having children: It consists of 28 questions divided into five categories (1-pleasure of pregnancy, birth, and childhood, 2-traditional view, 3-satisfaction with parenting, 4-feeling of need and survival, 5-using the child as a tool). To assess the findings, a Likert scale was used to grade from complete disagreement (scoring one) to complete agreement (scoring four). The minimum and maximum scores obtained in this section are 28 and 112, respectively. Having children can sometimes be accompanied by negative motivations, which stem from the fear of taking on the responsibilities of parenthood, dealing with the stress that comes with being a parent, facing challenges in childcare, and experiencing discomfort during pregnancy and birth, and they include 21 questions. A four-point Likert scale will be employed to assess the questionnaire. The scale ranges from one, indicating complete disagreement, to four, indicating complete agreement. The Persian version of Miller's motivation to have children questionnaire has been successfully validated in Iran, ensuring its reliability. The marks obtained in this section range from a minimum of 21 to a maximum of 84 (23). The questionnaire's content validity in this study was verified by consulting 7 academic staff members. The reliability of the questionnaire was assessed using the internal consistency reliability method (Cronbach's alpha), yielding a value of 0.9.

The Miller Reproductive Preference survey consists of 10 questions. The initial question in the survey focuses on the individual's desire to have children. A numerical rating system is employed to assess the desire for parenthood in this particular question. Individuals express their desire to have children by drawing a circle around a specific number on this scale. Among all numbers, the number one holds the lowest value. A higher score indicates a greater desire,

with a score of 10 representing a strong desire to have children. The desire to have children is evaluated on a scale ranging from 0 to 3 for low desire, 3 to 7 for medium desire, and 8 or above for high desire. Furthermore, the questionnaire included open-ended questions about the number of children individuals desired, the timing they preferred for having children, and the gender composition they envisioned for their future offspring. Miller et al. (2005) conducted a medical study to evaluate and confirm the validity of the fertility preferences questionnaire. The reliability of the questionnaire was assessed using the internal consistency reliability method (Cronbach's alpha), yielding a value of 9 (24).

Once the information was gathered, it was input into SPSS software (version 16) for analysis. The data was then analyzed using both descriptive and inferential statistics. To assess the correlation between variables, Pearson's correlation coefficient was utilized, taking into account the normal distribution of the data. In addition, descriptive statistics and the Kruskal–Wallis test (for non-normally distributed variables) were used in the analysis.

Results

The students at the medical school had an average age of 24.15±2.7, ranging from 19 to 24. The majority of them were non-native (82%) and had sufficient income (84%) (Table 1).

Table 1. Frequency distribution of demographic characteristics of students (n=220)

Variable	Frequency (%)
Level of education	
Associate degree	4(1.8)
Bachelor's degree	48 (21.8)
Master's degree	46 (20.9)
Doctorate	122 (55.5)
College	
Medicine	99 (45)
Dentistry	26 (11.8)
Pharmacy	17 (7.7)
Nursing and Midwifery	43 (19.5)
Health Sciences	13 (5.9)
Paramedicine	22 (10)
Occupation	
Student worker	18 (8)
Unemployed student	202 (92)
City	
Mashhad	39 (17.7)
Other cities	181 (82.3)

Variable	Frequency (%)
Family income	
Less than enough	22 (10)
Sufficient	185 (84.1)
More than enough	13 (5.9)
Housing status	
Owner	169 (76.8)
Leasing-Mortgage	33 (15)
Housing of relatives	3 (1.4)
Other	15 (6.8)
Father's education	
High school	37 (16.8)
Diploma	38 (17.3)
Associate degree	18 (8.2)
Bachelor's degree	79 (35.9)
Master's degree	36 (16.4)
PhD and above	12 (5.5)
Mother's education	
High school	45 (20.5)
Diploma	53 (24.1)
Associate degree	14 (6.4)
Bachelor's degree	71 (32.3)
Master's degree	33 (15)
PhD and above	4 (1.8)
Father's occupation	
Worker	13 (5.9)
Employee	98 (44.5)
Free lancer/ Self-employed	61 (27.7)
Unemployed	3 (1.4)
Other	45 (20.5)
Mother's occupation	
Housewife	133 (60.5)
Manual worker	6 (2.7)
Employee	57 (25.9)
Other	24 (10.9)
The level of future intentions for marriage	
High	41 (18.6)
Medium	97 (44.1)
Low	68 (30.9)
No intension	14 (6.4)
The level of parents' willingness to have children in the future	
High	88 (40)
Medium	58 (26.4)
Low	53 (24.1)
not know	21 (9.5)

The total mean score for positive motivations of childbearing was 62.14±16.7 (ranging from 28–109), whereas negative fertility motivations mean was 47.27±10.84 (ranging from 21–76). The average level of students' desire to become parents was 4.46±2.52 (on a scale of 1 to 10), and the average anticipated duration for the birth of their first child following marriage was

calculated to be 40.57±25.45 months. The students' average desired number of children was 2.03±1.02 (Table 2).

In the secondary findings of this study, it was determined using the Pearson correlation test showed that there is a significant correlation between all dimensions of positive motivations of childbearing and fertility preferences. However, most of these correlations were poorly calculated (0.3 < r < 0.5). The dimension of pregnancy pleasure and the desire to have children were moderately correlated (0.5 < r < 0.7) (P < 0.01). A significant correlation was found between factors including fear of parenthood, childcare challenges, the desired number of female children, the desired number of male children, the desired number of children, and the desired timing of the first child's birth after marriage (r= 0.3, P <0.01).

Table 2. Mean, standard deviation, and range of scores of positive and negative motivations of childbearing and fertility preferences (n=220)

Fertility motivation	The range of obtainable score	The range of obtained score	Mean ± SD
The positive motivations of childbearing			
The joy of pregnancy, birth, and childhood	6-24	6-24	11.85 ± 3.93
Traditional view	6-24	6-24	15.66 ± 4.31
Parenting satisfaction	6-24	6-24	11.13 ± 3.56
Feeling of need and survival	4-16	4-16	8.9 ± 3.04
Instrumental use of the child	6-24	6-24	14.59 ± 3.67
Total score	28-112	28-109	62.14 ± 16.17
The negative motivations of childbearing			
Parenting stress	6-24	6-24	11.15 ± 4.27
Pregnancy discomfort	2-8	2-8	5.7 ± 1.55
Fear of becoming a parent	6-24	6-23	13 ± 3.58
Care challenges	7-28	7-28	17.38 ± 4.30
Total score	21-84	21-76	47.27 ± 10.84
Fertility preferences			
Desire to have children	1-10	1-10	4.46 ± 2.52
Desired number of female children	0-∞	0-5	1.2 ± 0.62
Desired number of male children	0-∞	0-3	1.12 ± 0.47
Desired number of children	0-∞	0-8	2.03 ± 1.02
Desired time of marriage until the birth of the first child (month)	0-∞	0-240	40.57 ± 25.45

To analyse the relationship between demographic characteristics and the total score of positive and negative fertility motivations, the Kruskal-Wallis test was employed due to the non-normal distribution of the scores. The findings from this examination indicated a clear correlation between the monthly earnings of the individuals and their inclination toward positive motivations for fertility ($\chi^2(2) = 7.12$, P = 0.008). Notably, individuals with insufficient income demonstrated the highest levels of positive motivations. Furthermore, a correlation was seen between the educational attainment level and the overall score of favorable fertility motivations ($\chi^2(3) = 9.45$, P = 0.024). Notably, the group with higher education displayed the highest level of positive motivations. Statistical analysis indicated no significant correlation between demographic characteristics including level of education, college , occupation, city , family income, housing status, parents' education and occupation and negative fertility motivations.

Discussion

This study aimed to investigate the relationship between childbearing motivation and fertility preferences among female university students.

The reproductive behavior and choices of young girls have a profound impact on shaping the future population dynamics of any country. As part of their incentive policies, countries with a potential decline in population growth aim to correct the beliefs held by this particular group of individuals (25). The findings of this study

indicate a clear and direct correlation between individuals' positive motivations for pregnancy and their fertility preferences. With the growth of positive fertility motives in individuals, there has been a corresponding rise in the desire to start a family, the favored number of children, and the ideal interval between marriage and the birth of the first child. A study by Khadivzadeh et al. (2012) examining 450 couples attending premarital health centers in Mashhad showed a significant positive relationship between positive fertility motivations, the desire to have children, and the preferred number of children, which is consistent with the results of the current research. Nevertheless, the present study revealed a noteworthy negative correlation with the preferred timeframe for starting a family, contradicting our findings (4). This inconsistency could be attributed to the differing sample compositions. Khadivzadeh et al. examined couples attending health centers for counseling, while the current study analyzed unmarried female students. The findings from Miller's (1995) research conducted in the United States regarding the correlation between positive motivations and the inclination to start a family, as well as the preferred family size, aligned with the findings of the current study. However, Miller's study did not find any correlation between positive motivations toward childbearing and the time gap between marriage and the birth of the first child (24). In contrast, our study reveals that as positive motivation towards fertility increases, so does the desired duration between marriage and the first child's birth. The cause of this contrast can be attributed to the cultural and environmental differences between the two investigated societies. Moreover, even though the proximity between marriage and the birth of the first child plays a significant role in fertility, the extended length of study samples, despite the desire to conceive, can be explained by the heightened knowledge about fertility. Historically, this gap was small due to the belief that the probability of fertility decreased as the age of marriage increased. Furthermore, awareness surrounding contraceptive methods has increased, and advancements in fertility have reduced anxieties about future infertility (26-27). The younger generation and couples today are increasingly

focused on convenience and self-fulfillment, resulting in a decline in childbirth rates and a longer gap between marriage and the birth of the first child (28).

In this study, a significant and explicit link was established between unfavorable fertility motivations, specifically the fear of embracing parenthood, and the obstacles encountered in caregiving, thereby impacting fertility preferences. With the rise in apprehension and concerns surrounding parenthood, coupled with the difficulties of nurturing a child post-birth, the adverse factors influencing fertility have also witnessed a surge. In the research conducted by Medizi et al. (2004), it was found that negative motivations exhibited a significant and inverse correlation with the desire to have children (29). Nevertheless, in the investigation carried out by Khadivzadeh et al. (2012), there was no substantial correlation observed between negative motivations of childbearing and any of the elements comprising fertility preferences. This contradiction could be attributed to variances in the study population. The participants in this particular study were exclusively single female students who had no prior experience of cohabitation. Conversely, Khadiovazadeh et al.'s research involved 450 couples who sought guidance from premarital health centers in Mashhad.

According to the findings of this study, couples who obtained higher scores on the traditional view subscale, exhibited increased positive fertility motivations. For an extended period in Iran, high fertility has played a crucial role in determining one's social and family standing, while infertility has been a valid reason for divorce. This may explain the relationship between the traditional view and fertility (30). Furthermore, the current study revealed that couples who rated higher on the joy of pregnancy, birth, and childhood phenomena were more inclined to have children, aligning with research by Khadivzadeh et al. (2014) (4).

The findings indicated a significant relationship between education level and the total score of positive motivation for fertility. Interestingly, individuals with higher education demonstrated the highest level of positive motivation, which contradicts the findings of

Motlaq et al.'s (2016) study. The research findings indicated that higher-educated couples had a desire to have children but envisioned smaller families and delayed parenthood timing (4,31). The fertility rate can be influenced by various factors, such as entering university and the subsequent increase in education levels. This can indirectly impact individual attitudes and opinions, leading to the formation of modern attitudes. Furthermore, raising the age of marriage and thereby delaying childbearing can have a direct impact on fertility rates.

Amid increasingly challenging economic circumstances, the affluent classes experience significant shifts in their decisions regarding marriage and parenthood. Nevertheless, many individuals from lower socioeconomic backgrounds continue to prioritize early marriage and having children without delay. The scenario where individuals from the middle or impoverished economic classes have children can be seen as an instance of a breach in this context. The current investigation revealed a correlation between the monthly earnings of the study participants and their positive inclination toward fertility. It was observed that individuals with lower income exhibited the highest level of positive motivation, which aligns with the findings of Khadiovazadeh et al. (2012) and Pardhan et al. (2010) (32).

Individuals who possess significant wealth generally do not perceive children as a source of financial gain owing to their autonomy and economic well-being. The receipt of livelihood subsidies may have contributed to the increased desire for children in certain low-income sections of society. This is because households without a specific source of income tend to expand the number of people in their household to maximize the subsidy amount.

While it is commonly encouraged for couples to start a family before getting married, the emphasis on the reasons behind this decision is often lacking. At present, health centers do not offer any counseling or educational programs regarding parenthood for unmarried young individuals who are eligible for marriage. Numerous studies have highlighted the significance of offering information, counseling, and training to young women in the realm of childbearing. In study conducted by Rezaee et al.

(2022) (14), it was determined that the implementation of group counseling and applying motivational interviewing techniques, has proven to be successful in enhancing the motivation levels of female students at Mashhad University of Medical Sciences to start a family.

This study benefits from the use of validated measurement tools, an adequate and scientifically calculated sample size, and the inclusion of unmarried female students—a population rarely examined in previous research. In addition, assessing both positive and negative childbearing motivations provided a comprehensive understanding of fertility preferences. A limitation of the current study is its lack of generalizability, primarily attributed to its narrow focus on students enrolled at Mashhad University of Medical Sciences. It is recommended that comparable studies be conducted at universities in other cities across the country, including non-medical universities. The data on motivation of childbearing among students and young people in the country can serve as a valuable resource for evidence-based planning to increase the nation's fertility rate.

Conclusion

The strong correlation between positive motivation for childbearing and fertility preferences suggests that fostering positive motivations among young individuals prior to marriage could potentially boost fertility rates within the community.The desire towards parenthood among students was generally moderate and declining. With a significant portion of the study participants possessing advanced degrees (doctorates), the cultural authorities of the university must focus on fostering a culture that encourages and supports the desire to have children.

Declerations

Conflicts of interest

The authors declared no conflicts of interest.

Ethical considerations

All procedures were conducted according to Declaration of Helsinki and approved by the ethics committee of the Iran National Committee for Ethics in Biomedical Research, Research Ethics Committee of Mashhad University of Medical Sciences. This study upheld ethical standards by maintaining confidentiality and obtaining written informed consent from the participating students.

Code of Ethics

The current study received approval from the ethics committee of Mashhad University of Medical Sciences under the code IR.MUMS.NURSE.1400.040.

Use of Artificial Intelligence (AI)

AI tools and technologies are not used to prepare this manuscript.

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Authors' contribution

MM and PR conceived the research idea. MM led and managed the study. MM, MN and AN designed the study and defined the research objectives and methodology. Data gathering was carried out by PR and MR. Data analysis and interpretation were conducted by MN, MM and JJ, MN and AN drafted the manuscript and MM critically revised and refined it. All authors reviewed and approved the final manuscript and agreed to be accountable for all aspects of the work.

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