

ORIGINAL

Research on the mechanism of fertility support measures to increase the fertility rate

Investigación sobre el mecanismo de las medidas de apoyo a la fertilidad para aumentar la tasa de fertilidad

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ABSTRACT

Introduction: declining fertility rates present significant challenges to socioeconomic stability and population sustainability worldwide. Fertility support measures, including financial incentives, childcare, and parental leave policies, are crucial yet their effectiveness varies across different socioeconomic and cultural contexts. The aim is to examine the mechanisms of fertility support measures, such as economic, social, and health policies, and determine the effective strategies for increasing fertility rates and promoting family well-being.

Method: a mixed-methods approach was adopted, combining quantitative information from national fertility trends with qualitative insights collected from interviews and surveys conducted with a target population of 200 individuals. This methodology allows for a comprehensive understanding of the factors influencing fertility decisions.

Results: the findings underscore the importance of aligning fertility policies with broader social and economic frameworks to enhance their effectiveness. Key themes identified include the necessity of integrating fertility support into wider family welfare initiatives, addressing gender equity concerns, and creating a supportive environment for parenting.

Conclusions: this research contributes to understanding targeted interventions aimed at countering fertility decline and offers valuable insights for policymakers seeking sustainable solutions to this global issue. A holistic strategy that encompasses various aspects of family welfare is recommended to increase fertility rates effectively.

Keywords: Fertility Support; Fertility Rate; Population; Financial Incentives; Childcare; Parental Leave Policies.

RESUMEN

Introducción: la disminución de las tasas de fertilidad presenta desafíos significativos para la estabilidad socioeconómica y la sostenibilidad de la población en todo el mundo. Las medidas de apoyo a la fertilidad, incluidos los incentivos financieros, el cuidado de los hijos y las políticas de licencia parental, son cruciales, pero su eficacia varía según los diferentes contextos socioeconómicos y culturales. El objetivo es examinar los mecanismos de las medidas de apoyo a la fertilidad, como las políticas económicas, sociales y de salud, y determinar las estrategias eficaces para aumentar las tasas de fertilidad y promover el bienestar familiar.

Método: se adoptó un enfoque de métodos mixtos, combinando datos cuantitativos de las tendencias nacionales de fertilidad con información cualitativa obtenida de entrevistas y encuestas realizadas con una población objetivo de 200 individuos. Esta metodología permite una comprensión integral de los factores que

influyen en las decisiones de fertilidad.

Resultados: los resultados subrayan la importancia de alinear políticas de fertilidad con marcos sociales y económicos más amplios para mejorar su eficacia. Los temas clave identificados incluyen la necesidad de integrar el apoyo a la fertilidad en iniciativas más amplias de bienestar familiar, abordar las preocupaciones de equidad de género y crear un ambiente de apoyo para la crianza de los hijos.

Conclusiones: esta investigación contribuye a comprender las intervenciones dirigidas a contrarrestar la disminución de la fertilidad y ofrece información valiosa para los formuladores de políticas que buscan soluciones sostenibles a este problema mundial. Se recomienda una estrategia holística que abarque varios aspectos del bienestar familiar para aumentar las tasas de fertilidad de manera efectiva.

Palabras clave: Apoyo a la Fertilidad; Tasa de Fertilidad; Población; Incentivos Financieros; Cuidado de Niños; Políticas de Licencia Parental.

INTRODUCTION

Fertility is an essential demographic perception and it refers to the biological capability of people, particularly women to conceive and carry the children.⁽¹⁾ Although fertility is biologically rooted, it is significantly affected by a range of social, cultural, economic, and policy aspects, which collectively shape decision-making about childbearing. Fertility rates, especially the Total Fertility Rate (TFR), which is the primary measure, have been used to assess the reproductive trends in a population.⁽²⁾ A fertility rate ensures population stability, neither growing nor shrinking, and is measured the level of replacement.⁽³⁾ TFR is crucial for policymakers along with demographers and it facilitate to assessment the potential demographic trend and informs development in areas like healthcare, social services, and interactions growth.

Fertility rates in developed nations have dropped below alternative levels, causing concerns about long-term impacts, including an elderly population, reduced employment, and enlarged social welfare demands. These shifts pose challenge to economic productivity and the sustainability of programs such as allowance, healthcare, and social security.⁽⁴⁾ To address the, many governments have introduced policies aimed at encouraging higher birth rates. These procedures include financial incentives, such as tax sever and direct cash transfers, alongside policies that progress entrance to affordable childcare and parental leave.⁽⁵⁾

High fertility rates in developing countries drive rapid population growth, but also present challenges when population growth exceeds infrastructure enlargement and economic opportunities.⁽⁶⁾ In some regions, high fertility rates are linked to shortage, unemployment, and social dissimilarity, and they can aggravate environmental pressures. Fertility patterns are impacted by both physiological and mental features, as well as higher social and enriching factor. Cultural attitude toward marriage, family, and gender roles strongly manipulates fertility decisions.⁽⁷⁾

The policies that maintain families are critical for reproductive health,⁽⁸⁾ with pronatalist involvement such as support childcare and parental leave regularly implement to enlarge birth rates and maintain economic development. In China's one-child policy has been declared ineffectual due to a deteriorating demographic structure. The operation of the two-child policy has resulted in a disparity of birth rates, with higher rates concentrated in rural areas undergoing fast urbanization, are examined.⁽⁹⁾

An investigation⁽¹⁰⁾ looked at the link between sexual self-care and women with fertile potential who attended Urmia's extensive medical facility. According to the findings, women's education level and economic standing have a substantial influence on their reproductive desire. In March 2020, UK fertility clinics cancelled all Assisted Reproductive Technology (ART) treatments due to the Coronavirus Disease (COVID-19) pandemic, leading to increased psychological stress among fertility patients. Research⁽¹¹⁾ conducted through an online survey with 124 female participants whose ART treatments were cancelled, assessed their mental health and coping mechanisms.

Research highlighted the need for better communication strategies between clinics and patients during treatment delays. The investigation⁽¹²⁾ evaluated the relationship between reproductive intention and consequent actions in the atmosphere of China's two-child regulation. The influence of COVID-19 on women's reproductive desires within the framework of China's fertility rates enhancement strategy, which allows couples to have three children.⁽¹³⁾ Based on the Theory of Planned Behavior (TPB), a structural framework was developed to determine and evaluate the particular elements that influenced female reproduction aspirations throughout the epidemic.

Research⁽¹⁴⁾ explored the association between fertility loss during female aging to hormonal changes that particularly focused on basal Follicle-Stimulating Hormone (FSH) and Anti-Müllerian Hormone (AMH). Research⁽¹⁵⁾ examined absorption root properties in 112 tree species from moderate and continental ecosystems in China and focused on practical distinctions between Ectomycorrhizal (ECM) and Arbuscular Mycorrhizal (AM) hosts.

Utilizing findings from the European Social Survey,⁽¹⁶⁾ identified an important relationship between macro-level parenting supports and individuals' reproductive health. It found that practical considerations were more

influential for subsequent deliveries rather than the transition to parenting. The fertility-promoting effects of parental assists measures in Organization for Economic Cooperation and Development (OECD) nations ⁽¹⁷⁾ were investigated using Grey Correlation Analysis (GRA), regression analysis, and Fuzzy Set Qualitative Comparative Analysis (fsQCA).

Research aims to evaluate the effectiveness of fertility rates, including financial incentives, childcare, and parental leave policies, across different socio-economic and cultural contexts to identify strategies that enhance fertility rates and family well-being.

METHOD

The research employs a mixed-methods approach, using surveys and interviews with 200 participants to assess the efficacy of fertility support measures. SPSS software is utilized for correlation, descriptive, and multiple regression analyses to explore the relationship between various treatments and their effectiveness. The quantitative data on national fertility trends with qualitative data perceived by participants. It investigates fertility support strategies such as financial incentives, childcare assistance, and parental leave legislation. Correlation, descriptive, and multiple regression analysis are employed to determine the relationship between socioeconomic variables and fertility rates.

Data Collection

Research was gathered through a combination of surveys and interviews on fertility support initiatives in various regions. The data collection process was established with 500 participants, representing a variety of socioeconomic and cultural backgrounds. The data obtained includes responses on the comprehension, utilization, and efficacy of fertility support initiatives, such as financial incentives, childcare aid, parental leave regulations, and other associated support services. After the inclusion and exclusion criteria, 200 individuals are finalized for this research.

Inclusion and Exclusion Criteria

The inclusion criteria for the research ensured that participants were relevant to the investigation of fertility support measures. Participants were required to meet the following conditions:

1. Participants must be in the reproductive age category (18-45 years old). Participants must have resided in regions where fertility support measures (such as financial incentive, childcare support, and parental leave policy) are actively implemented.
2. Individuals who had some stage of revelation or experience with fertility support policies or procedures.

Exclusion Criteria:

Certain participants were eliminating from the research to protect the data relevant and high quality. The exclusion criteria were as follow:

1. Participants who have not previously used or experienced fertility assistance techniques.
2. Participants who provided inadequate or inaccurate surveys or interviews.

Research Design

Researches develop a mixed-methods approach to analyze fertility support measures' efficiency in growing fertility rates. It uses data from national fertility trends, correlation, descriptive, and multiple regression analysis to examine relationships between fertility rates and variables like age, employment, childbearing ratio, leave policies, traffic conditions, and medical expenditures. Research evaluates detailed interventions like financial incentive, parental leave policies, childcare support systems, and workplace flexibility programs. This advance provides a considerate of how culturally sensitive measures address fertility barriers, offering actionable insights for policymakers.

Statistical Analysis

Research utilizes SPSS for correlation, descriptive, and multiple regression methods to research the association between the efficacy of various treatments. The evaluations were intended to demonstrate an accurate understanding of the data.

- The descriptive analysis summarized data on demographics and fertility support measures, identifying trends like participation, fertility rate, and socio-economic factors affecting fertility, using frequencies, percentages, means, and standard deviations.
- This correlation observed substantial associations between childcare availability, higher fertility rates, parental leave regulations, and childbearing ratios.
- The multiple regression analysis revealed that financial incentives and accessible childcare support significantly increase fertility rates.

RESULTS

This section reveals that culturally sensitive interventions, that address fertility barriers, are more effective in increasing birth rates. The descriptive analysis reveals major demographic characteristics, with females, urban inhabitants, and employed individuals dominating the sample. Correlation and regression analysis reveal strong links between socioeconomic factors and fertility choices, with multifaceted fertility support interventions demonstrating promising results in raising fertility rates.

Demographic variables

Table 1 and figure 1 shows the demographic findings of the sample population (n=200) into several categories. The age groupings, the arrangement reveals that 30 individuals are between 18 and 24, 80 are between 25 and 34, 60 are between 35 and 44, and 30 are above 45. Gender proportion suggests a significantly unbalanced sample, with 160 females and only 40 males.

Demographic Variable	Category	Values (n=200)	Percentage (%)
Age Group	18-24	30	15 %
	25-34	80	40 %
	35-44	60	30 %
	Above 45	30	15 %
Gender	Male	40	20 %
	Female	160	80 %
Employment Status	Employed	130	65 %
	Unemployed	40	20 %
	Self-employed	30	15 %
Income Level	Low	50	25 %
	Middle	100	50 %
	High	50	25 %
Cultural Context	Urban	120	60 %
	Rural	80	40 %

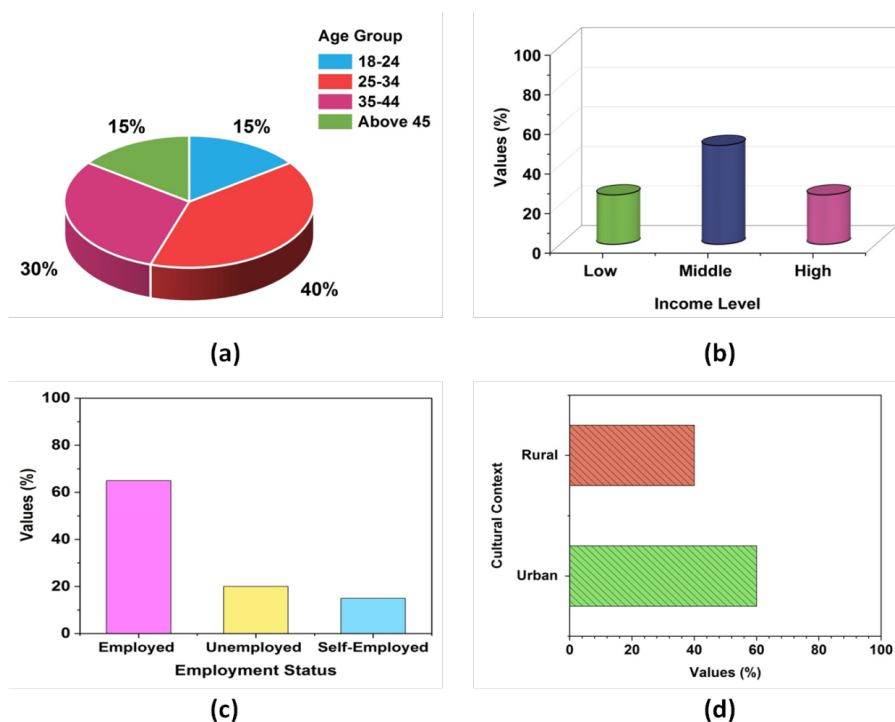


Figure 1. Representations of Demographic variables a) Age group b) Income level c) Employment status d) Cultural Context

Regarding employment status, the majority (130 people) are employed, 40 are unemployed, and 30 are self-employed. Consequently, in income level data, 50 people are classified as low-income, 100 as middle-income, and 50 as high-income.

Descriptive Analysis for Main Categories

The descriptive analysis results provide a statistical summary of the main demographic categories, including Age Group, Gender, Employment Status, Income Level, and Cultural Context. The mean and standard deviation (SD) were calculated to understand the central tendency and variability within the sample of 200 participants. Table 2 depicts the evaluation of descriptive analysis.

Demographic Variable	Mean	Standard Deviation (SD)
Age Group	2,45	1,09
Gender	1,80	0,40
Employment Status	1,50	0,66
Income Level	2,00	0,71
Cultural Context	1,40	0,49

Age Group, the mean of 2,45 suggests that most participants are concentrated in the age ranges, and the SD of 1,09 reflects moderate variability, indicating a relatively diverse age distribution. In terms of Gender, the mean demonstrates 1,80 and the SD of 0,40 indicates gender representation. The Employment Status represents the mean of 1,50 and the SD shows 0,66. Overall, the findings reveal key demographic trends and distributions within the sample, offering valuable insights into the composition of participants and the diversity across different categories.

Findings through Correlation Matrix

The purpose of this correlation matrix is to examine the relationships between fertility support measures such as financial incentives, parental leave policies, childcare support systems, and workplace flexibility programs. It helps in understanding how these measures are interrelated in promoting higher fertility rates. Figure 2 demonstrates the outcome of the correlation matrix.

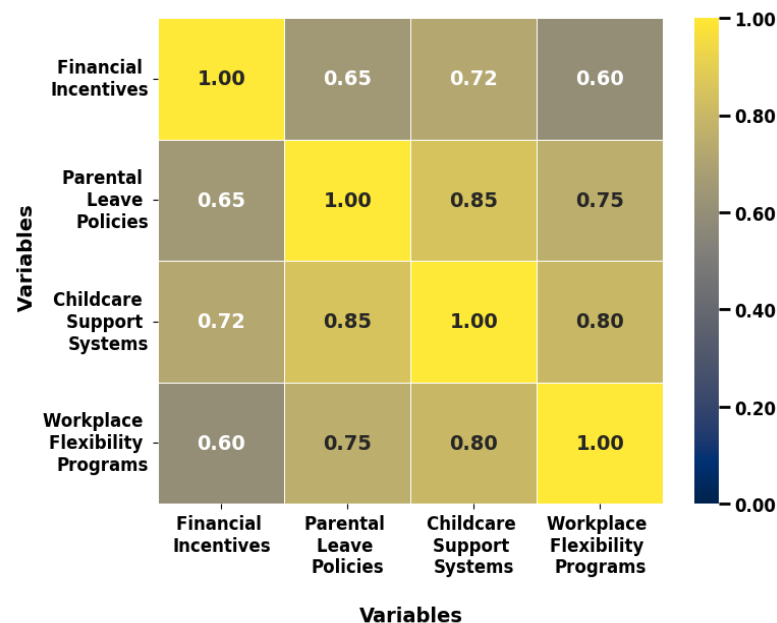


Figure 2. Graphical outcome of Correlation Matrix

It is essential for identifying key factors that influence fertility decisions, and shows the correlation between fertility support measures, based on data from multiple sources. Correlations represent the strength and direction of the linear relationship between each pair of variables. A moderate positive correlation (0,65) exists between financial incentives and parental leave policies. Strong positive correlations are observed between

parental leave policies and childcare support systems (0,85), as well as between childcare support systems and workplace flexibility programs (0,80). The weakest correlation (0,60) is between financial incentives and workplace flexibility programs, indicating a moderate relationship.

Multiple Regression Analysis

Multiple Regression Analysis is designed to analyze the relationship between socioeconomic and social variables, family planning decisions. It provides an understanding of how factors such as income, housing affordability, education, gender equality, and cultural norms influence family size preferences. This analysis provides insights into the mechanisms driving fertility choices. Table 3 represents the regression analysis of various socioeconomic and social variables that influence family planning decisions. Each variable's coefficient indicates the strength and direction of its impact on family-related outcomes.

Variables		Standard Error	t-value	p-value
Income Level				
Household Income	0,25	0,10	2,50	0,014
Income Inequality	-0,15	0,05	-3,00	0,003
Housing Affordability				
Household Expenditure on Housing	-0,30	0,12	-2,50	0,016
Availability of Affordable Housing	0,20	0,08	2,50	0,018
Education				
Educational Attainment Levels	0,10	0,05	2,00	0,045
Schooling Access and Affordability	0,18	0,07	2,57	0,012
Gender Equality Index				
Gender Pay Gap	-0,20	0,10	-2,00	0,047
Gender Equality in Household Tasks	0,15	0,06	2,50	0,015
Cultural Norms on Family Size				
Ideal Number of Children	0,30	0,09	3,33	0,001
Social Stigma Related to Childlessness	-0,25	0,08	-3,13	0,002
Family Structure				
Single-Parent Households	-0,40	0,14	-2,86	0,005
Multigenerational Households	0,35	0,10	3,50	0,000

Household Income is positively related to family planning decisions ($B = 0,25$, $p = 0,014$), suggesting that higher income levels can encourage larger family sizes. Income Inequality has a negative effect on family size preferences ($B = -0,15$, $p = 0,003$), indicating that greater income disparity can reduce fertility. Housing Affordability shows a negative correlation with family planning, as higher expenditure on housing ($B = -0,30$, $p = 0,016$) and limited affordable housing options ($B = 0,20$, $p = 0,018$) reduce family size preferences. Educational Attainment and Schooling Access are positively associated with family planning choices, suggesting that better education and access to schooling encourage larger families ($B = 0,10$, $p = 0,045$ and $B = 0,18$, $p = 0,012$, respectively). Gender Pay Gap ($B = -0,20$, $p = 0,047$) and Cultural Norms on Family Size ($B = 0,30$, $p = 0,001$) significantly influence fertility decisions, with a larger gender pay gap discouraging fertility, and cultural expectations favoring larger families. Family Structure factors, such as the presence of single-parent households ($B = -0,40$, $p = 0,005$) and multigenerational households ($B = 0,35$, $p = 0,000$), also significantly impact family planning decisions.

DISCUSSION

Investigate the relationship between postpartum reproductive traits in nursing Holstein cows and single nucleotide polymorphisms (SNPs) from the PAPP2 gene. In all, 362 cows were used in this investigation, with DNA extracted from individual blood samples obtained on FTA cards and two PAPP2 SNPs genotyped. For allele substitution analysis, only the SNP rs109952914 was linked to all reproductive characteristics. The T allele was favorable, decreasing services per conception (-0,16) and days open (-1952), while increasing pregnancy at first service (+12,60). Given its predictive value for post partum fertility, SNP rs109952914 proposed as a genetic marker for improving reproductive efficiency in Holstein cattle in warm climates.⁽¹⁸⁾

This research investigated of Leukemia inhibitory factor in ovarian folliculogenesis and fertility by modulating the ovarian cholinergic system infertile and sub fertile rats. In vivo and in vitro analyses showed that LIF significantly raised ovarian ACh levels without altering them in vitro or in vivo. It reduced ChAT and AChE mRNA levels in fertile rates and promoted corpus luteum information while increasing serum AMH and progesterone. In sub fertile rates, LIF increased tiny corpus luteum without altering progesterone or follicular development. Despite these effects, LIF did not influence fertility outcomes. The findings suggest that the LIF/LIFR system is expressed in both fertile and subfertility phases, regulating follicular development and steroidogenesis through STAT3 progesterone ultimately promoting ovulation.⁽¹⁹⁾

Research explores fertility support measures' effectiveness in addressing declining fertility rates, revealing factors such as income, housing affordability, education, gender equality, and cultural norms influencing fertility rates. The investigation demonstrated a positive relationship between household income and fertility choices, with higher income levels corresponding to bigger family sizes. Financial stability influences family planning decisions, while income disparity and accessibility to housing reduce rates of fertility. Education has a beneficial effect on fertility decisions in more complicated families. These results highlight the relevance of educational programs in promoting fertility rise. The multiple regression investigation exposed that family structure, particularly multigenerational property, influence fertility decisions, whereas families with one parent had less conception desires, highlighting the necessity for social and financial assistance. Research anticipated an extensive strategy to enlarge fertility rates that includes financial, social, and cultural apparatus such as gender equality, financial support, and accessible educational facilities and housing.

CONCLUSION

This research demonstrates the importance of culturally responsive and diversified reproductive assistance approaches in addressing declining birth rates. The data show that financial incentives, parental leave rules, childcare help, and workplace flexibility all have a major impact on fertility decisions, with high connections among them. Socioeconomic factors such as income level, housing affordability, education, gender equality, and cultural norms all influence family planning preferences. Higher household income and educational attainment increase fertility, whereas economic inequality, high housing expenses, and gender pay inequities reduce family size options. Furthermore, multigenerational households promote larger families, whereas single-parent households associated with lower fertility rates. These findings underline the importance of a comprehensive policy strategy that incorporates economic, social, and cultural policies in order to provide a favorable environment for parenting. The implementation of comprehensive and equitable fertility policies that are in accordance with larger social welfare frameworks is necessary for policymakers to effectively combat the drop in fertility and support sustainable population increase.

Limitations and Future Scope of the Research: Research limitations include small sample size, potential bias, and incapability to predict long-term outcomes. Future research should widen the illustration, incorporate technology, and consider external aspects for more widespread insight.

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CONFLICT OF INTEREST

None.

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