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Factors associated with fertility intention among adults attending public primary care clinics in Kuala Lumpur: A theory of planned behavior approach

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Abstract

Malaysia's total fertility rate has declined sharply, falling below replacement level since 2013, with Kuala Lumpur recording one of the country's lowest rates. Previous Malaysian fertility research has predominantly examined demographic and socioeconomic factors associated with fertility intention, with limited attention to psychological factors based on the theory of planned behavior (TPB). This study aimed to examine sociodemographic and social-psychological factors associated with fertility intention among adults attending public primary care clinics in Kuala Lumpur, using the TPB. This cross-sectional study employed systematic random sampling to recruit 968 adults attending two public primary care clinics, who completed a validated TPB-based questionnaire; multivariable logistic regression identified factors independently associated with fertility intention. Overall, 69.3% of respondents reported that they probably or definitely intended to have children. Attitude (adjusted odds ratio [aOR] = 1.23; 95% CI, 1.17–1.29) and subjective norm (aOR = 1.35; 95% CI, 1.24–1.48) were independently associated with fertility intention, whereas perceived behavioral control was not. Younger age (aOR = 30.25), Islamic religion (aOR = 6.99), and government- (aOR = 2.23) or private-sector (aOR = 3.14) employment were also independently associated with fertility intention. These findings support and refine the TPB's applicability in a previously untested Southeast Asian, multi-ethnic urban context, indicating that reproductive health policy should incorporate behavioral and social interventions that address personal attitudes and family expectations, alongside attention to employment circumstances, rather than relying solely on economic incentives.

Keywords: Fertility intention; Theory of planned behavior; Attitude; Subjective norm; Perceived behavioral control; Urban

1. Introduction

Over recent decades, Malaysia has experienced a steady and notable decline in its total fertility rate, falling from 4.9 children per woman in 1970 to below the replacement threshold of 2.1 from 2013 onwards and reaching 1.6 births per woman in 2024 (Department of Statistics Malaysia, 2025). This level falls well below the replacement threshold and signals long-term demographic shifts (Bongaarts, 2009). Kuala Lumpur, the nation's most urbanized Federal Territory, is of particular concern, having registered a total fertility rate of 1.3 in 2024, one of the lowest rates in Malaysia, compared with 1.5 in Selangor and 1.2 in Pulau Pinang (Department of Statistics Malaysia, 2025).

This pattern of fertility decline, especially concentrated in urban centers, carries substantial demographic and public health implications that extend well beyond the immediate concern of falling birth numbers. Sustained below-replacement fertility accelerates population aging, altering the ratio of working-age adults to older dependents and placing growing pressure on pension and social security systems designed for a younger population structure (Jegasothy *et al.*, 2020). A shrinking and aging workforce also carries implications for labor force sustainability and long-term economic productivity, while rising demand for eldercare services occurs alongside a shrinking pool of family caregivers, weakening traditional intergenerational support structures. Within the healthcare system, this demographic shift is expected to reshape service demand, with declining birth-related and pediatric care needs occurring alongside a growing burden of age-related chronic disease and long-term care. These interlinked pressures on the labor market, social protection systems, and healthcare infrastructure carry direct consequences for Malaysia's long-term national development trajectory. However, the social-psychological factors associated with fertility intentions in the context of this fertility decline, particularly in highly urbanized settings like Kuala Lumpur, remain poorly understood. Understanding the factors associated with fertility intention is hence both pertinent and essential. Fertility intention, defined as an individual's desire or decision to have children, is a recognized proximate determinant of actual reproductive behavior, even though the correspondence between stated intention and subsequent childbearing is imperfect and varies across populations and time horizons (Berrington, 2021; Michalos, 2014; Miller, 2011). Although structural and demographic characteristics, including age, educational attainment, household income, marital status, religion, and number of children, are frequently associated with fertility intention (Shafie *et al.*, 2021; Tey *et al.*, 2012), they may not comprehensively elucidate the process by which individuals make reproductive decisions.

Social-psychological influences, though less readily observed, may play an equally important role in shaping such decisions. A widely applied framework in this domain is the theory of planned behavior (TPB). First introduced by Ajzen (1991), the theory proposes that behavioral intentions are shaped by three core components: attitude toward the behavior, subjective norm, and perceived behavioral control. These constructs are theorized to combine to form an overall intention, each drawing on a distinct underlying belief structure: attitude reflects beliefs about the personal outcomes of having children; subjective norm reflects beliefs about what significant others expect, combined with the motivation to comply; and perceived behavioral control reflects beliefs about facilitating or constraining factors, such as financial resources, employment stability, or partner support. Perceived behavioral control is theorized to play a dual role, shaping intention directly while also independently predicting actual behavior when real-world constraints limit the extent to which intentions translate into action.

The TPB is particularly well suited to rapidly urbanizing societies such as Malaysia, where family norms are shifting and childbearing decisions increasingly involve an explicit weighing of competing personal, social, and economic considerations. Urbanized settings may involve more heterogeneous social networks, while rising living costs and career demands may be relevant to individuals' perceived control over the practical feasibility of childbearing, conditions under which the TPB's explicit separation of attitudinal, normative, and control-related influences is well suited to capturing this complexity. The TPB is not, however, the only framework relevant to fertility decision-making in Malaysia's rapidly urbanizing, multi-ethnic setting, and relying on it alone risks overlooking the broader structural and cultural forces that shape the particular form its psychosocial mechanisms take in this context. Demographic Transition Theory situates falling fertility within broader socioeconomic development; the Second Demographic Transition links it to value change and the decoupling of marriage and childbearing. Life Course Theory frames fertility intention as embedded within evolving life-stage transitions rather than fixed, and Gender Equity Theory highlights the potential relevance of domestic and caregiving asymmetries to fertility intention even where attitudes remain favorable (Bongaarts, 2009; Doepke *et al.*, 2022; Lesthaeghe, 2010; Liefbroer, 2009; McDonald, 2000).

Based on the TPB and the available empirical evidence, the present study examines whether attitude toward the behavior, subjective norm, and perceived behavioral control are associated with fertility intention in the Malaysian context. Accordingly, hypotheses are developed for each of the three TPB constructs.

Attitude toward the behavior, reflecting an individual's overall favorable or unfavorable evaluation of having children, is theorized to influence intention through beliefs about the anticipated outcomes and consequences of childbearing (Ajzen, 1991). In fertility decision-making, these evaluations may reflect the anticipated benefits and disadvantages associated with having a child, with more favorable evaluations expected to strengthen the intention to have children. Empirically, attitude has been one of the TPB constructs most consistently associated with fertility intention. Ajzen and Klobas (2013) found attitude to be a significant predictor across five European nations, while in Italy, attitude emerged as one of the most influential constructs in a dyadic study of couples' fertility intentions (Matera *et al.*, 2023). The consistency between the TPB's theoretical expectation and empirical findings across these settings supports the expected positive association between attitude and fertility intention. Accordingly, we hypothesize that:

H1: More positive attitudes toward childbearing are associated with greater fertility intention.

Subjective norm, reflecting perceived social pressure from significant others to perform or not perform a behavior, captures the extent to which reproductive decisions may be influenced by the perceived expectations of family, friends, and other important social referents (Ajzen, 1991). In the context of fertility, this is particularly relevant because decisions about childbearing are embedded in family and interpersonal relationships rather than determined solely by personal evaluation. According to the TPB, stronger perceived normative support for childbearing would therefore be expected to strengthen fertility intention. Empirical evidence supports this relationship, although its relative importance varies across settings. Subjective norm was significant across the European nations studied by Ajzen and Klobas (2013) and emerged as the dominant predictor among Chinese college teachers (Yao, 2024). The relevance of perceived social expectations across these different cultural settings suggests that stronger normative support for childbearing may similarly be associated with greater fertility intention. Accordingly, we hypothesize that:

H2: Stronger subjective norms toward childbearing are associated with greater fertility intention.

Perceived behavioral control, reflecting an individual's perceived ease or difficulty of performing a behavior, concerns the extent to which an individual perceives that the resources, opportunities, and circumstances required to perform a behavior are within their control (Ajzen, 1991). In fertility decision-making, an individual may hold favorable attitudes toward having a child and perceive social support for doing so, while nevertheless considering childbearing difficult to realize due to personal or external circumstances. The TPB therefore proposes that greater perceived control should strengthen behavioral intention. Empirical support for this relationship in fertility research, however, has been less consistent than in attitude research. While perceived behavioral control was significant across the European nations studied by Ajzen and Klobas (2013) and was among the most influential constructs in an Italian dyadic study of couples' fertility intentions (Matera *et al.*, 2023), it was not significant among Chinese college teachers (Yao, 2024). This variation in findings suggests that the contribution of perceived behavioral control to fertility intention may differ across populations and settings. Despite this empirical variation, the TPB provides a clear theoretical expectation: greater perceived control should be associated with stronger fertility intentions. Accordingly, we hypothesize that:

H3: Greater perceived behavioral control is associated with greater fertility intention.

Taken together, the available evidence indicates that the relative contribution of each TPB construct varies considerably across cultural and study settings, which limits how far findings from any single setting can be assumed to generalize to Malaysia, where the population is multi-ethnic and multi-religious. The fertility transition has occurred over a markedly more compressed timeframe than in the European and East Asian settings where much of the existing TPB fertility evidence originates (Wihardja & Siregar, 2024). Comparative evidence from East, Southeast, and South Asia suggests that social and normative factors are prominently associated with fertility intentions across the region despite differences in the timing of fertility decline (Yeung & Abalos, 2025), suggesting that the TPB's core constructs may plausibly generalize even where demographic and cultural contexts differ; the present study treats this as an open empirical question for Malaysia specifically.

Delayed marriage has been a particularly prominent factor associated with fertility decline in Malaysia: the average age at marriage for women rose from 27.5 years in 2016 to 29.1 years in 2024 and for men from 30.1 to 31.2 years, thereby shortening the reproductive window for many couples (Malaysia Population Research Hub, 2024). This has occurred alongside rising female educational attainment and labor force participation, both of which are linked to lower fertility rates in Malaysia (Awad & Yussof, 2017). These broader demographic and socioeconomic changes form the context within which individual attitudes, perceived social expectations, and perceived control over childbearing are likely to operate in Kuala Lumpur.

Existing Malaysian research has been largely descriptive or demographic, with limited focus on social-psychological constructs, and has concentrated mainly on rural populations (Shafie *et al.*, 2021), leaving urban populations underexplored. Prior Malaysian fertility research has therefore been able to describe patterns of fertility across population groups. However, it has provided only limited insight into the social-psychological factors associated with reproductive decision-making, as demographic and descriptive approaches do not capture the underlying mechanisms. Applying the TPB in this context therefore offers a novel contribution beyond existing Malaysian fertility research: rather than only documenting sociodemographic correlates of declining fertility, this study applies a theory-driven framework to examine the social-psychological factors associated with fertility intention, an approach not yet undertaken in Malaysia despite its wide application elsewhere.

Given that Kuala Lumpur's fertility rate is already well below the national average, the city offers a distinct socioeconomic and cultural context for assessing how social-psychological factors are associated with reproductive decision-making. The general objective of this study was therefore to examine the sociodemographic and social-psychological factors associated with fertility intention among adults attending public primary care clinics in Kuala Lumpur, Malaysia, using the TPB. Specifically, this study aimed to: (i) determine the prevalence of fertility intention among adults attending public primary care clinics in Kuala Lumpur; (ii) examine the association between sociodemographic characteristics and fertility intention; (iii) examine the associations between social-psychological factors (attitude, subjective norm, and perceived behavioral control) and fertility intention; and (iv) identify factors independently associated with fertility intention.

Understanding fertility intention has become increasingly important as Malaysia continues to experience sustained below-replacement fertility and rapid demographic aging. Identifying both social-psychological and sociodemographic factors associated with fertility intention may provide evidence to inform reproductive health strategies and broader population policies that are responsive to these factors in the Malaysian context.

2. Data and methods

2.1. Study design

This cross-sectional study was conducted among adults attending public primary care clinics in Kuala Lumpur. A cross-sectional design was considered appropriate for this study, as it allows for the estimation of the prevalence of fertility intention and the examination of associations between explanatory variables and fertility intention within a defined population at a single point in time, without requiring prolonged follow-up. This design is well suited to the study's primary objectives of describing fertility intention and identifying its correlates in this population; however, because exposure and outcome are measured simultaneously, it does not permit establishing temporal sequence or causal relationships between the TPB constructs, sociodemographic characteristics, and fertility intention. The study aimed to examine factors associated with fertility intention, the primary outcome of interest. The main independent variables comprised social-psychological constructs derived from the TPB, namely attitude, subjective norm, and perceived behavioral control. In addition, sociodemographic characteristics including age, sex, ethnicity, religion, occupation, education level, household income, marital status, and parity were included in the analysis to examine their associations with fertility intention.

2.2. Study sites and settings

The research took place in Kuala Lumpur, Malaysia's most urbanized state and the region with the lowest fertility rate among the country's highly urbanized states. This persistently low level, far below replacement levels, highlights the city's relevance as a study setting for understanding fertility decisions in an urban, multicultural population. Data collection was conducted at two public primary care clinics in Kuala Lumpur, selected through a multistage random sampling procedure. Two of Kuala Lumpur's four administrative health districts were randomly selected, followed by random selection of one public primary care clinic from each selected district. Recruitment was proportionally allocated between the two clinics based on their patient attendance volumes, with approximately 60% of participants recruited from the first clinic and 40% from the second.

2.3. Study population

The target population comprised Malaysian citizens attending public primary care clinics who met all of the following criteria: (i) aged between 18 and 49 years; (ii) residing in Kuala Lumpur, either as a permanent resident or having lived in the city for at least one year; (iii) able to read and understand Malay sufficiently to complete a self-administered questionnaire; and (iv) willing to provide written informed consent. Individuals were excluded if they had cognitive or mental impairment that could reasonably affect their ability to understand the study or provide informed consent, or if they had previously taken part in the questionnaire's psychometric validation, to avoid overlap between the two samples.

At the participant level, systematic random sampling was conducted at registration counters among patients attending outpatient and maternal and child health services. A random starting point between 1 and 10 was generated at the beginning of each recruitment day, after which every 10th patient in the registration sequence was selected for eligibility screening. Patients who fulfilled the eligibility criteria were invited to participate. Sampling alternated between morning and afternoon sessions across recruitment days to capture patients attending at different times.

Participant recruitment and data collection were conducted between January 1 and August 31, 2025.

2.4. Study instruments

Data collection employed a self-administered questionnaire adapted from the Generations and Gender Survey Baseline Questionnaire (Gauthier *et al.*, 2024). The original English items were translated into Malay through forward–backward translation and harmonization.

Prior to its use in the present study, the questionnaire underwent a separate psychometric validation phase conducted at two public primary care clinics selected using the same multistage sampling approach applied in the main study, within the same districts but distinct from the clinics used for the main study sample, to avoid overlap between the validation and main study samples. The validation phase comprised content validity assessment, face validity assessment, a pilot study, test–retest reliability assessment, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA), conducted sequentially.

Content validity was assessed by a panel of eight subject-matter experts, evaluating each item for relevance and clarity. Item-level content validity index values ranged from 0.88 to 1.00, with corresponding modified kappa values ranging from 0.87 to 1.00. The scale-level content validity index was 0.96 for relevance and 0.97 for clarity.

Face validity was assessed among 10 participants from the target population, using cognitive debriefing to evaluate item understandability and clarity. Item-level face validity index values ranged from 0.90 to 1.00, with a scale-level face validity index of 0.97.

A pilot study was subsequently conducted among 36 participants to assess feasibility and internal consistency reliability. Reliability analysis demonstrated good internal consistency, with Cronbach's alpha values of 0.93 for attitude, 0.93 for subjective norm, 0.91 for perceived behavioral control, and 0.76 for fertility intention.

Test–retest reliability was evaluated among 34 participants who completed the questionnaire twice, two weeks apart. Intraclass correlation coefficients ranged from 0.61 to 1.00 across items, with most items exceeding 0.90, indicating good to excellent temporal stability.

Construct validity was confirmed through EFA (n = 150) and CFA (n = 300). EFA identified a four-factor structure consistent with the TPB, corresponding to attitude, subjective norm, perceived behavioral control, and fertility intention (the Kaiser–Meyer–Olkin statistic = 0.88; Bartlett's test χ^2 = 2422.58, df = 276, $p < 0.001$), with factor loadings ranging from 0.58 to 0.93 across constructs. CFA using partial least squares structural equation modeling supported this structure, with the final measurement model demonstrating indicator loadings ranging from 0.734 to 0.941 across constructs, each above the recommended threshold of 0.708. Average variance extracted ranged from 0.61 to 0.85, and composite reliability ranged from 0.90 to 0.94 across constructs, supporting convergent validity. Discriminant validity was supported by heterotrait-monotrait ratio values ranging from 0.22 to 0.55, well below the recommended threshold of 0.90. Model fit was acceptable (standardized root mean square residual = 0.076; normed fit index = 0.818).

The final validated questionnaire comprised five sections. The first section captured sociodemographic characteristics, including age, sex, ethnicity, religion, occupation, education level, household income, marital status, and parity. The second section assessed attitudes toward having children using 10 items, rated on a five-point Likert scale from "much worse" to "much better." The third section measured subjective norms using three items, rated from "strongly disagree" to "strongly agree." The fourth section assessed perceived behavioral control using six items, rated from "not at all" to "a great deal." Composite scores for attitude, subjective norm, and perceived behavioral control were calculated by summing the respective item responses, with higher scores indicating more favorable attitudes, stronger perceived social pressure, and greater perceived control, respectively. The final section measured fertility intention using a single item asking whether participants intended to have a child or an additional child, rated on a four-point scale from "definitely not" to "definitely yes," which was dichotomized into having versus not having fertility intention for the binary logistic regression analysis.

2.5. Measures

The dependent variable, fertility intention, was measured using a single item and dichotomized into two categories: "probably/definitely yes" and "probably/definitely no."

Scores for the TPB constructs were computed by summing responses to their respective items, each

measured on a five-point Likert scale: for attitude items, from "much worse" (1) to "much better" (5); for subjective norm items, from "strongly disagree" (1) to "strongly agree" (5); and for perceived behavioral control items, from "not at all" (1) to "a great deal" (5). Higher scores indicated more favorable attitudes, stronger perceived social expectations, and greater perceived control, respectively; the summed scores were treated as continuous variables in the regression analyses.

Sociodemographic variables were coded as follows, consistent with the categories reported in Table 1: sex (female, male); age (18–29, 30–39, and 40–49 years), reflecting distinct stages of the reproductive life course; ethnicity (Malay, non-Malay); religion (Islam, non-Islam); occupation (unemployed, government, private, self-employed); education level (no education, primary, secondary, tertiary); monthly household income, categorized into five groups (≤RM3,169; RM3,170–4,849; RM4,850–7,099; RM7,100–10,959; and ≥RM10,960), based on the household income distribution reported in the Household Income and Basic Amenities Survey 2019 (Department of Statistics Malaysia, 2020); marital status (married, single); and parity, grouped into four categories (0, 1, 2, and 3 or more children), consistent with categorizations commonly used in fertility research to distinguish nulliparous, primiparous, and multiparous groups.

2.6. Statistical analysis

All analyses were performed using IBM SPSS Statistics version 27 (IBM Corp., United States of America). Descriptive statistics were used to summarize sociodemographic characteristics. Assumption testing was conducted prior to the logistic regression analyses to ensure the appropriateness of the selected statistical approach. Normality of the continuous variables was evaluated using skewness and kurtosis; values below 2 and 7, respectively, were considered indicative of an acceptable approximation to normality given the sample size. The assumption of linearity between each continuous variable and the logit of the outcome was assessed using the Box–Tidwell procedure, in which interaction terms between each continuous variable and its natural logarithm were included in the model; non-significant interaction terms ($p > 0.05$) indicated that the assumption of linearity of the logit was satisfied.

Associations between independent variables and fertility intention were first examined using simple logistic regression, with crude odds ratios (cORs) and 95% confidence intervals (CIs) reported. Variables with p-values < 0.25 in the univariable analysis were entered into a multivariable logistic regression model, and adjusted odds ratios (aORs) with 95% CIs were calculated to identify factors independently associated with fertility intention. Multicollinearity among covariates in the multivariable logistic regression model was assessed using variance inflation factors (VIFs), with a VIF of 10 or greater indicating problematic collinearity. Given the substantial collinearity between ethnicity and religion, two alternative multivariable models were compared: one that retained religion and excluded ethnicity (Model A), and one that retained ethnicity and excluded religion (Model B). Model performance was evaluated using the −2 log-likelihood, the likelihood ratio test, Cox and Snell R^2, Nagelkerke R^2, the Hosmer–Lemeshow goodness-of-fit test, overall classification accuracy, and the area under the receiver operating characteristic curve (AUC). The model demonstrating superior overall performance was retained as the final multivariable model. Statistical significance was set at a two-tailed p-value of less than 0.05. Interaction terms between parity and each TPB construct were also examined in the final multivariable model to assess whether parity modified the associations between these constructs and fertility intention.

Several potential sources of bias were considered in this study's design. Selection bias from clinic-based recruitment was minimized through multistage random sampling of districts, clinics, and patients and alternating recruitment sessions across clinic hours; nonetheless, individuals who do not access public primary care, including those relying on private healthcare, may be underrepresented. Information and recall bias were minimized through a validated, standardized questionnaire assessing current rather than retrospective attitudes and intentions. Interviewer bias was minimized by the self-administered format, and social desirability bias, a particular concern given the sensitive nature of reproductive intentions, was addressed through anonymity. Residual confounding from unmeasured variables, such as partner characteristics, housing conditions, and childcare access, could not be entirely excluded and is acknowledged as a limitation of the study.

3. Results

3.1. Sociodemographic characteristics

A total of 968 respondents participated in the study (Table 1). The sample was predominantly women (64.2%) in their 30s (49.0% aged 30–39 years, followed by 39.8% aged 18–29 years, and 11.3% aged 40–49 years). Most respondents were Malay (63.6%) and Muslim (64.3%) and were employed in the government sector (55.1%), with 34.5% in the private sector and 5.8% self-employed. Educational attainment was

relatively high, with 38.3% reporting tertiary education, and 60.2% of respondents were married. Parity was fairly evenly distributed, with close to half (48.7%) reporting no children at the time of the survey. There were no missing data across the study variables.

3.2. Fertility intention

Overall, 671 respondents (69.3%) reported that they probably or definitely intended to have children, whereas 297 respondents (30.7%) indicated that they probably or definitely did not intend to do so.

3.3. Distribution of responses across theory of planned behavior constructs

The distribution of individual item responses for attitude, subjective norm, and perceived behavioral control is presented in Figures 1–3.

For attitude, responses were predominantly favorable across all items, with combined "better" and "much better" responses exceeding 55% and surpassing 70% for several items. Emotional and relational items showed the strongest endorsement: 71.8% of respondents anticipated positive change in joy and satisfaction (44.3% "better," 27.5% "much better"); 69.0% in closeness with a partner (45.5% "better," 23.5% "much better"); and 76.1% in closeness with parents (41.6% "better," 34.5% "much better"), the highest of any item. Social perception was similarly favorable, with 67.1% expecting a positive change in how others view them. Financial and employment-related items showed comparatively more neutral responses: 55.0% anticipated a positive change in financial situation, alongside 34.0% neutral and 11.1% negative responses, the highest negative proportion recorded for any attitude item, while 60.3% anticipated a positive change in employment opportunities. Negative responses remained low across all items, ranging from 3.5% to 11.1%.

For subjective norm, responses were clustered around the neutral and agree categories. Among friends, 46.1% responded neutrally, while 45.4% agreed or strongly agreed and 8.5% disagreed. Among parents, positive responses were somewhat stronger: 49.7% agreed or strongly agreed, 40.7% were neutral, and 9.6% disagreed. A similar pattern was observed for other relatives (48.9% positive, 40.7% neutral, 10.5% negative). Across all three referent groups, positive responses ranged from approximately 45% to 50%, while negative responses remained consistently below 10%.

For perceived behavioral control, responses were more widely and evenly distributed than for the other two constructs. High perceived control ("quite a lot" or "a great deal") was reported by 50.8% to 56.9% of respondents across items, with the highest levels reported for work (56.9%) and the lowest for health (50.8%). Low perceived control ("not at all" or "a little") was reported by 30.2% to 34.4% of respondents and was most pronounced for health (34.4%) and housing conditions (31.2%). Moderate control accounted for the remainder (11.0% to 15.4%) across all items.

Table 1. Sociodemographic characteristics of the respondents (*N* = 968)

Characteristic	Frequency (*n*)	Percentage (%)
Age		
18–29 years	385	39.8
30–39 years	474	49.0
40–49 years	109	11.3
Sex		
Female	621	64.2
Male	347	35.8
Ethnicity		
Malay	616	63.6
Non-Malay	352	36.4
Religion		
Islam	622	64.3
Non-Islam	346	35.7
Occupation		
Unemployed	45	4.6
Government	533	55.1
Private	334	34.5
Self-employed	56	5.8
Education level		
No education	56	5.8
Primary	134	13.8
Secondary	407	42.0
Tertiary	371	38.3
Monthly household income		
≤RM 3,169	127	13.1
RM 3,170–RM 4,849	202	20.9
RM 4,850–RM 7,099	393	40.6
RM 7,100–RM 10,959	143	14.8
≥RM 10,960	103	10.6
Marital status		
Married	583	60.2
Single	385	39.8
Parity		
0	471	48.7
1	150	15.5
2	191	19.7
≥3	156	16.1

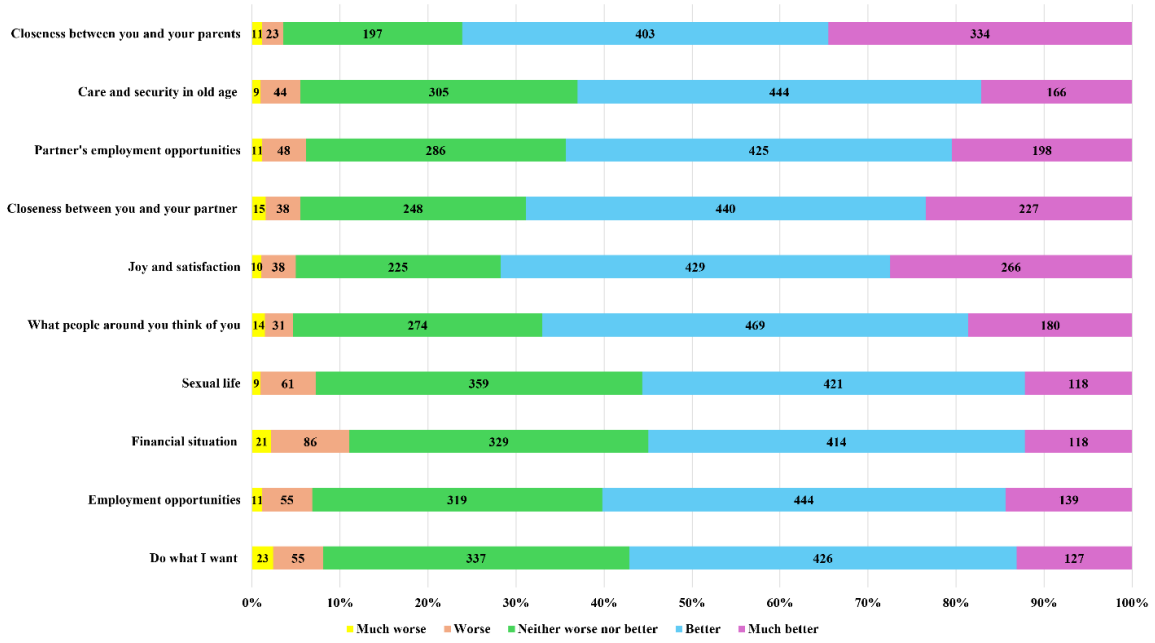


Figure 1. Proportion of responses on attitudes toward having a child, based on the question, "If you were to have a/another child during the next three years, would it be better or worse for…?" ($N = 968$)

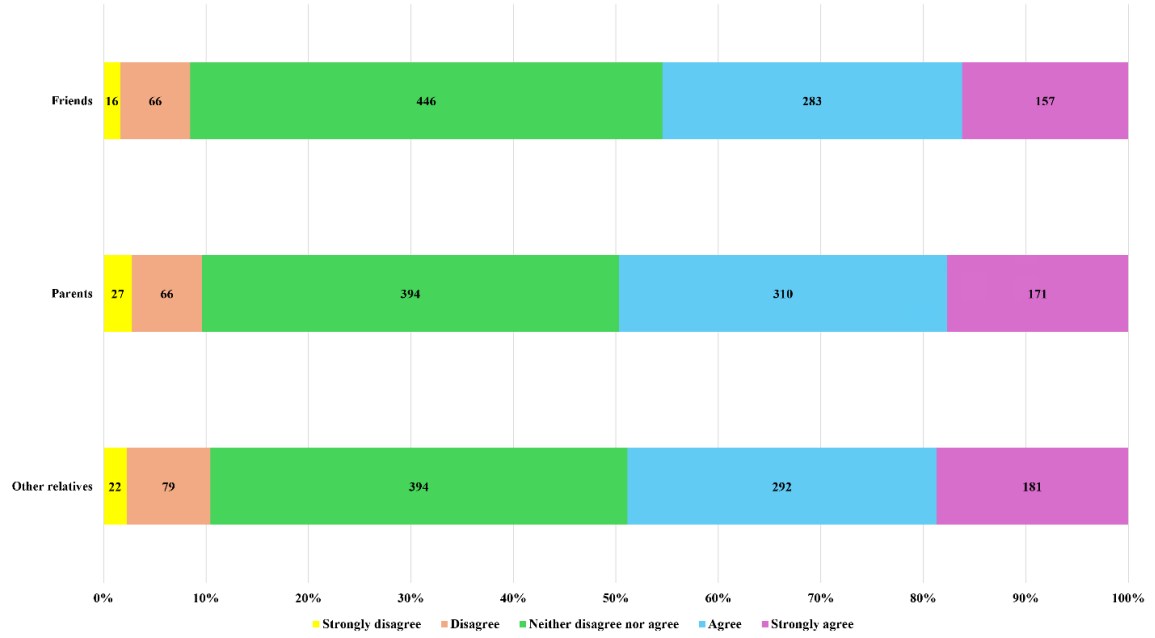


Figure 2. Proportion of responses on subjective norm toward having a child, based on the question, "Do the following people think you should have a/another child?" ($N = 968$)

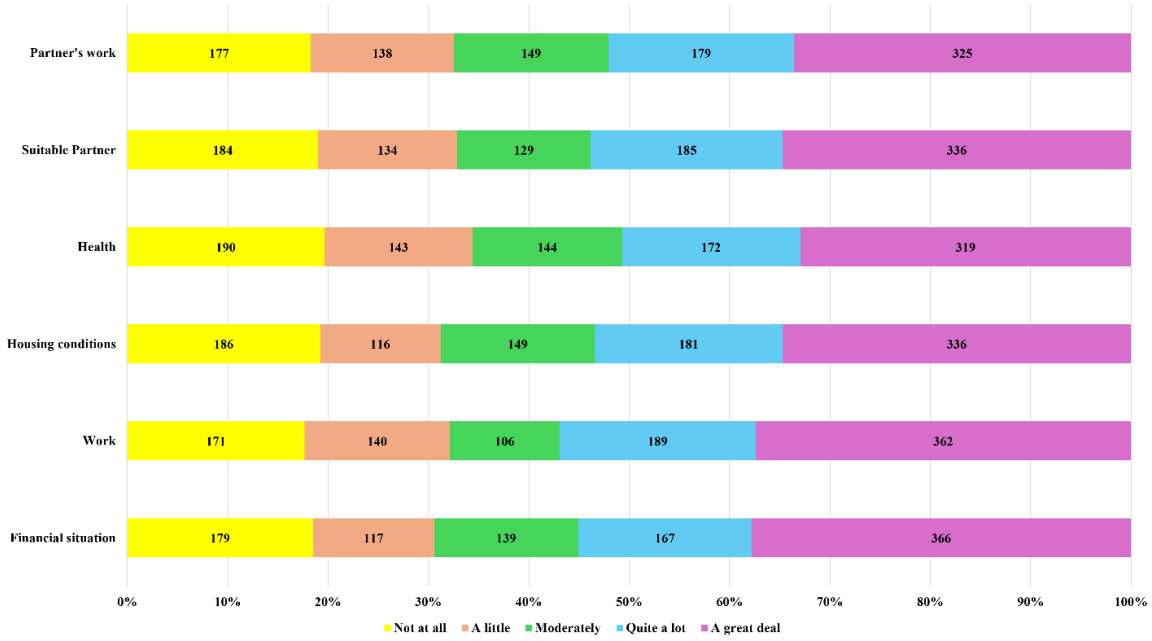


Figure 3. Proportion of responses on perceived behavioral control toward having a child, based on the question, "How much would your decision depend on…?" ($N = 968$)

3.4. Logistic regression analysis

In the univariable analyses, younger age, Islamic religion, government- or private-sector employment, higher attitude scores, and stronger subjective norms were significantly associated with fertility intention. Prior to constructing the multivariable model, covariates were assessed for multicollinearity using VIFs. VIFs ranged from 1.01 to 2.48 for all covariates except ethnicity and religion, which showed severe multicollinearity (VIF = 39.01 and 42.37, respectively). Given this collinearity, two alternative multivariable models were compared, retaining either religion (Model A) or ethnicity (Model B), with all other covariates unchanged. Model A demonstrated marginally better overall fit and discrimination, with a lower −2 log likelihood (749.52 vs. 754.10), higher Nagelkerke R^2 (0.519 vs. 0.515), and higher AUC (0.875 vs. 0.873), although both models showed acceptable calibration (Hosmer–Lemeshow $p = 0.596$ and 0.922, respectively) and classification accuracy (83.2% vs. 83.3%). Model A was therefore selected as the final multivariable logistic regression model, with religion retained and ethnicity excluded.

In the multivariable model (Table 2), each one-point increase in attitude score was associated with 23% higher odds of intending to have children (aOR = 1.23; 95% CI, 1.17–1.29; $p < 0.001$), and each one-point increase in subjective norm score was associated with 35% higher odds (aOR = 1.35; 95% CI, 1.24–1.48; $p < 0.001$). Notably, perceived behavioral control, one of the three core TPB constructs, was not significantly associated with fertility intention even in the univariable analysis (cOR = 0.99; 95% CI, 0.97–1.02; $p = 0.612$) and therefore did not meet the criterion for inclusion in the multivariable model, in contrast to attitude and subjective norm, which were both and independently associated with fertility intention after adjustment.

Among sociodemographic variables, respondents aged 18 to 29 years had 30 times higher odds of intending to have children compared with those aged 40 to 49 years (aOR = 30.25; 95% CI, 14.43–63.42; $p < 0.001$), and those aged 30 to 39 years had 19 times higher odds (aOR = 19.19; 95% CI, 9.30–39.59; $p < 0.001$). Being Muslim was associated with approximately seven times higher odds of fertility intention compared with non-Muslim respondents (aOR = 6.99; 95% CI, 3.86–12.66; $p < 0.001$). Government-sector employment was associated with more than double the odds of fertility intention relative to self-employment (aOR = 2.23; 95% CI, 1.08–4.63; $p = 0.031$), and private-sector employment was associated with approximately three times higher odds (aOR = 3.14; 95% CI, 1.45–6.77; $p = 0.004$). Selected categories of education, household income, marital status, and parity, which were significant in univariable analysis, did not remain significant after adjustment in the multivariable model.

Table 2. Univariable and multivariable logistic regression of sociodemographic and social-psychological factors associated with fertility intention

Variables	Univariable			Multivariable		
	cOR	95% CI	*p*-value	aOR	95% CI	*p*-value
Age						
18–29 years	31.43	17.22 – 57.70	<0.001	30.25	14.43 – 63.42	<0.001*
30–39 years	15.10	8.46 – 26.97	<0.001	19.19	9.30 – 39.59	<0.001*
40–49 years		Ref			Ref	
Sex						
Female	1.03	0.78 – 1.37	0.824	–	–	–
Male		Ref				
Ethnicity						
Malay	0.64	0.47 – 0.85	0.002	–	–	–
Non-Malay		Ref				
Religion						
Islam	0.60	0.45 – 0.81	<0.001	6.99	3.86 – 12.66	<0.001*
Non-Islam		Ref			Ref	
Occupation						
Unemployed	0.47	0.20 – 1.08	0.074	0.73	0.24 – 2.22	0.581
Government	2.87	1.64 – 5.00	<0.001	2.23	1.08 – 4.63	0.031*
Private	3.55	1.98 – 6.34	<0.001	3.14	1.45 – 6.77	0.004*
Self-employed		Ref			Ref	
Education level						
No education	0.43	0.24 – 0.76	0.004	1.05	0.37 – 2.99	0.924
Primary	0.69	0.46 – 1.05	0.086	0.85	0.44 – 1.65	0.637
Secondary	1.02	0.74 – 1.39	0.922	1.25	0.78 – 2.02	0.358
Tertiary		Ref			Ref	
Household income						
≤RM 3,169	0.44	0.25 – 0.77	0.004	0.41	0.16 – 1.05	0.063
RM 3,170–RM 4,849	0.95	0.56 – 1.63	0.850	0.65	0.29 – 1.45	0.294
RM 4,850–RM 7,099	0.79	0.48 – 1.29	0.342	0.62	0.30 – 1.28	0.195
RM 7,100–RM 10,959	1.06	0.59 – 1.88	0.854	0.68	0.32 – 1.47	0.328
≥RM 10,960		Ref			Ref	
Marital status						
Married	1.32	1.00 – 1.74	0.048	1.16	0.57 – 2.36	0.687
Single		Ref			Ref	
Parity						
0	1.16	0.79 – 1.69	0.436	1.02	0.47 – 2.22	0.967
1	1.95	1.18 – 3.20	0.009	1.60	0.81 – 3.13	0.173
2	1.92	1.21 – 3.06	0.006	1.58	0.86 – 2.91	0.138
≥3		Ref			Ref	

(*Cont'd...*)

Table 2. (*Continued*)

Variables	Univariable			Multivariable		
	cOR	95% CI	*p*-value	aOR	95% CI	*p*-value
Attitude	1.15	1.12 – 1.18	<0.001	1.23	1.17 – 1.29	<0.001*
Subjective norm	1.47	1.37 – 1.57	<0.001	1.35	1.24 – 1.48	<0.001*
Perceived behavioral control	0.99	0.97 – 1.02	0.612	–	–	–

Notes: cOR: Crude odds ratio; aOR: Adjusted odds ratio; CI: Confidence interval; Ref: Reference category. Variables with $p < 0.25$ in the univariable analysis were considered for inclusion in the multivariable logistic regression model. Ethnicity was excluded from the multivariable analysis because of multicollinearity. "–" indicate variables not included in the multivariable model. Asterisks (*) indicate statistically significant associations in the multivariable analysis ($p < 0.05$). Hosmer–Lemeshow test $p = 0.596$ (p-value > 0.05), model fit. Cox and Snell $R^2 = 0.368$. Nagelkerke $R^2 = 0.519$. Classification rate of 83.2%. Area under the receiver operating characteristic curve = 0.875.

The final multivariable logistic regression model was statistically significant (likelihood ratio $\chi^2(19) = 444.09$, $p < 0.001$), indicating that the included variables significantly improved model fit compared with the intercept-only model. The model demonstrated adequate calibration (Hosmer–Lemeshow $\chi^2(8) = 6.46$, $p = 0.596$), explained 36.8% (Cox and Snell R^2) to 51.9% (Nagelkerke R^2) of the variation in fertility intention, achieved an overall classification accuracy of 83.2%, and showed good discrimination (AUC = 0.875). To further examine one unexpected finding, interaction analyses examining parity as a moderator of the associations between attitude, subjective norm, and fertility intention identified no statistically significant interactions (all $p > 0.05$). Given the unexpected absence of an independent association between parity and fertility intention in the fully adjusted model, sensitivity analyses using alternative specifications of parity yielded consistent findings. Parity remained non-significant when modeled as an ordered variable (aOR = 0.94; 95% CI, 0.74–1.20; $p = 0.619$) and when regrouped as 0, 1–2, and ≥3 children (overall $p = 0.184$). Sequential model building further showed that parity remained significantly associated with fertility intention after adjustment for sociodemographic characteristics alone (overall $p = 0.047$), but the association became non-significant following the subsequent inclusion of the TPB constructs.

4. Discussion

4.1. Prevalence of fertility intention

Overall, 69.3% of respondents reported that they probably or definitely intended to have children, while 30.7% indicated that they did not. This proportion of respondents with no fertility intention is notably higher than in studies from other settings. For instance, in a large survey of Australian university students, fewer than 10% reported not wanting children, and the majority (75%) desired two or more children (Prior *et al.*, 2019). Similarly, analysis of recently married couples in Iran found that only 2.1% intended to remain childless, while 16.9% expressed a preference for just one child (Bagi, 2022). These findings highlight that in Kuala Lumpur's urban context, the share of adults reporting no fertility intention is considerably higher compared to both high-income (Australia) and middle-income (Iran) settings, although differences in study populations and measurement should be considered when interpreting these comparisons. Broader contextual differences across settings may also be relevant to the observed variation in fertility intention.

These patterns should be interpreted against Malaysia's ongoing demographic transition. Delayed marriage, rising female educational attainment and labor force participation, and increasing urban living costs have each been associated with below-replacement fertility. These structural shifts may be associated with the social-psychological factors examined here rather than operating independently: delayed marriage and dual-income norms may be relevant to the cautious financial attitudes observed, while urbanization's more individualized social networks may be relevant to why subjective norms, though significantly associated with fertility intention, were not more strongly polarized. The psychosocial factors examined in this study may therefore be considered within the broader structural context in which individuals make reproductive decisions.

The sample's composition is also relevant to this prevalence figure. The predominance of women in their thirties reflects the clinics' maternal and child health caseload, and this age and sex distribution should be considered when interpreting the relatively high prevalence observed, particularly given the association between age and fertility intention observed in this study. The predominance of government-sector employment, which was also associated with fertility intention in the present analysis, should likewise be considered when interpreting the prevalence estimate.

4.2. Social-psychological determinants of fertility intention (theory of planned behavior constructs)

Attitudes toward having a child were generally favorable, particularly regarding emotional and relational aspects such as anticipated joy, satisfaction, and closeness within the family, consistent with the literature linking positive childbearing orientations to expectations of emotional fulfillment and strengthened interpersonal relationships (Duran & Cevik, 2026). Responses related to financial and employment considerations were more cautious, suggesting that economic factors may be relevant to how individuals evaluate childbearing; while financial stability and employment security have been associated with fertility intentions, uncertainties in these domains may coexist with otherwise positive attitudes without necessarily reversing their direction (Ramos *et al.*, 2025). Similar findings have been reported in a recent TPB study in Hong Kong, which found that positive attitudes toward marriage and childbearing were independently associated with fertility intention among non-parent participants (Chen *et al.*, 2024). Efforts to sustain favorable attitudes toward childbearing may therefore benefit from addressing the economic uncertainties that accompany these evaluations, rather than targeting attitudes alone.

Subjective norms were present but not strongly polarized, indicating that perceived social expectations vary in their relevance across individuals. This observation is consistent with research highlighting subjective norms as an important, though context-dependent, factor associated with fertility intention (Yao, 2024) and with evidence that perceived social pressure plays a prominent role in fertility-related decision-making within collectivist, family-oriented societies (Philipov & Berghammer, 2007). This suggests that family and community-level engagement, rather than individual-level messaging alone, may be particularly relevant to how fertility-related information and support are delivered within Malaysia's family-oriented social context.

Perceived behavioral control demonstrated greater variability than the other two constructs, with a notable proportion of respondents reporting limited control over financial, health, and partner-related domains, even though many perceived a reasonable level of control overall. Consistent with the TPB, perceived behavioral control reflects individuals' assessment of their capacity to manage childbearing within existing life circumstances, with higher perceived control generally associated with stronger intention formation (Ciritel *et al.*, 2019; Matera *et al.*, 2023). Previous literature has linked this perception to broader structural conditions, including economic uncertainty, housing affordability, and work-related demands (Qiu, 2025; Testa & Gietel-Basten, 2014; Yu & Li, 2024). Such constraints may be associated more with the postponement than the abandonment of childbearing intentions, allowing individuals to retain an intention to have children while adjusting their timing (Riederer & Buber-Ennser, 2019).

The findings provided partial support for the TPB. Attitude and subjective norm were independently associated with fertility intention, supporting H1 and H2, respectively. In contrast, perceived behavioral control was not significantly associated with fertility intention; therefore, H3 was not supported. This finding indicates that the full TPB model was not supported in the present population and that perceived behavioral control may not show the same pattern of association with fertility intention as the other two TPB constructs in this setting. Although previous studies have reported variation in the relative contribution of the three TPB constructs to fertility intention, the reasons for the absence of an association with perceived behavioral control in the present study cannot be determined from these cross-sectional data.

These findings carry meaningful implications for the TPB's applicability to fertility intention. The significant associations for attitude and subjective norm provide support for these components of the TPB, extending this support to a previously untested Southeast Asian, multi-ethnic urban population. The non-significant finding for perceived behavioral control also warrants consideration in relation to the TPB's applicability to fertility intention. Ajzen's (1991) original formulation recognizes that the role of perceived behavioral control may vary according to the degree of actual control over a behavior. Childbearing is only partly volitional and may depend on circumstances such as partnership, financial resources, and employment conditions. Nevertheless, whether these considerations account for the absence of an independent association with perceived behavioral control in the present study cannot be established. Longitudinal research examining both fertility intentions and subsequent reproductive behavior would help clarify the role of perceived behavioral control in this context.

These findings can also be situated within broader demographic theories. Demographic Transition Theory frames Malaysia's decline as part of broader socioeconomic development, within which the TPB's mechanisms operate as proximate determinants (Bongaarts, 2009). The Second Demographic Transition's emphasis on individualization appears only partly consistent with the cautious financial attitudes observed, given the continued strength of subjective norm and religion in this sample, suggesting normative and cultural expectations remain

more prominent here than the theory's individualization thesis would predict (Lesthaeghe, 2010). Life course theory provides a useful framework for interpreting the pronounced age gradient, situating intention within evolving life-stage transitions rather than as a fixed preference (Liefbroer, 2009). Gender equity theory offers a plausible, though untested, explanation for the cautious employment-related attitudes, given persistent domestic gender asymmetries in Malaysia (McDonald, 2000). Recent economic theories emphasizing career–family compatibility over income alone are similarly consistent with these attitudes (Doepke *et al.*, 2022).

Fertility intentions are also formed within wider socioeconomic and structural contexts. Employment conditions and work–family compatibility have been identified as important considerations in reproductive decision-making, with employment instability associated with greater uncertainty around childbearing intentions (Gatta *et al.*, 2022). In the Malaysian context, qualitative evidence among working mothers in Kuala Lumpur has similarly highlighted how competing work and family responsibilities may be relevant to reproductive and employment decisions (Ravindranath *et al.*, 2021). Housing and broader economic circumstances may further be associated with the perceived feasibility and timing of childbearing, particularly in highly urbanized settings where living costs are substantial. These conditions may be related to the psychosocial processes captured by the TPB, as individuals form evaluations of childbearing within the practical circumstances of their lives. However, these broader structural factors were not examined as independent variables in the present analysis, and their specific associations with fertility intention cannot be established from the current findings.

It is worth noting that much of this evidence base originates from countries with a long-established history of below-replacement fertility, where the TPB was originally conceived and has been most extensively tested, whereas Malaysia's fertility decline has occurred over a comparatively more recent and compressed timeframe (Wihardja & Siregar, 2024). The significant association between subjective norm and fertility intention observed here is consistent with broader regional evidence that social and normative pressures around marriage and childbearing remain prominent across East, Southeast, and South Asia despite differing timing of fertility decline (Yeung & Abalos, 2025).

4.3. Sociodemographic determinants of fertility intention

Age was significantly associated with fertility intention, with progressively lower fertility intention observed across older age groups and notable reductions among both men and women in older groups (Adejugbe & Ahmed, 2025), consistent with older adults, particularly women, exhibiting more polarized views toward childbearing as awareness of biological constraints grows (Wagner *et al.*, 2019). Previous literature has related this age pattern to increased risks of infertility and pregnancy complications in later reproductive years (Beaujouan *et al.*, 2019). This pattern is also consistent with life-course perspectives, which situate fertility intention within evolving partnership status and life priorities, rather than biological capacity alone (Liefbroer, 2009). Given this pronounced age gradient, reproductive health literacy and family planning counseling may be most relevant when delivered to younger adults, with primary care settings offering an accessible platform.

Religion was significantly associated with fertility intention, with Muslim respondents more likely to intend to have children than non-Muslims, consistent with Islamic cultural and doctrinal values that emphasize marriage, family formation, and childbearing. Similar associations have been reported in China, where Islamic affiliation remained associated with higher fertility preferences after adjustment for socioeconomic factors (Xie & Zhou, 2022). More broadly, religiosity has consistently been identified as an important sociodemographic correlate of fertility-related attitudes across populations (Halimatusa'diyah & Toyibah, 2021), while evidence from West Bengal, India, also indicates that Muslim women are more likely than Hindu women to have additional births (Haque & Patel, 2016). Together, these findings indicate that religion remains relevant to understanding reproductive decision-making in Malaysia. Consequently, reproductive health policies and fertility promotion strategies may be more effective when they acknowledge the country's religious and cultural diversity rather than adopting a uniform approach.

Government- or private-sector employment was also significantly associated with fertility intention, consistent with evidence that stable employment offering job protection and family-related benefits is associated with higher fertility intentions (Cavalli, 2013). Job security has similarly been identified as an important factor associated with childbearing plans (Gatta *et al.*, 2022), whereas job instability and economic insecurity have been associated with lower fertility intentions (Modena *et al.*, 2014). This pattern points to a potential role for extending workplace protections to groups outside formal employment, including the self-employed.

The attenuation of education, household income, and marital status after adjustment may reflect shared

associations with other variables in the multivariable model, such as age, occupation, and religion, although the cross-sectional analysis cannot establish the mechanisms underlying this attenuation. Among the factors independently associated with fertility intention, age showed a particularly pronounced association, while religion, occupation, attitude, and subjective norm also remained independently associated with the outcome. Unlike perceived behavioral control, parity was retained in the multivariable model. However, it was not independently associated with fertility intention after adjustment, contrasting with much of the fertility literature, in which the previous number of children is often among the strongest factors associated with intentions for additional childbearing. To further examine this observation, interaction analyses were performed to examine whether parity modified the associations between the TPB constructs retained in the final multivariable model and fertility intention. No statistically significant interactions were observed between parity and either attitude or subjective norm (all $p > 0.05$), indicating that the associations between these constructs and fertility intention were consistent across parity groups and that the lack of an independent association for parity is unlikely to be explained by effect modification. Sensitivity analyses using alternative specifications of parity yielded consistent findings, suggesting that the result was unlikely to be attributable solely to the original parity categorization. Sequential examination further showed that parity remained associated with fertility intention after adjustment for sociodemographic characteristics, but the association became non-significant following inclusion of the TPB constructs. This pattern may reflect overlap between parity and the TPB constructs in their associations with fertility intention; however, the cross-sectional design does not allow the nature or direction of these relationships to be determined. The finding should therefore be interpreted cautiously and not taken as evidence that parity is unimportant in fertility decision-making.

4.4. Public health and policy implications

Beyond their theoretical contribution, these findings have direct practical relevance for reproductive health practice and policy in Malaysia. Given the independent associations of attitude and subjective norm with fertility intention, reproductive health interventions may benefit from extending beyond conventional family planning services to incorporate behavioral and psychosocial approaches. Within primary care, where participants in this study were recruited, reproductive counseling could incorporate discussion of personal attitudes toward childbearing, family and community expectations, and available social support. Community-based reproductive health communication may similarly benefit from engaging partners and family networks, given the independent association observed for subjective norm, rather than targeting individuals alone. Given the substantially higher fertility intentions observed among younger respondents, such approaches may be particularly relevant when proactively directed toward younger adults while reproductive intentions and related life plans are still being formed. The association with religion further suggests that reproductive health communication should be sensitive to religious diversity rather than adopting a uniform approach. Differences by occupation also indicate that the employment context warrants attention regarding fertility intentions, although the specific employment-related factors that may account for this association require further investigation. Taken together, these findings suggest that behavioral and social dimensions, alongside the sociodemographic contexts in which fertility decisions are made, should be considered in broader efforts to address fertility decline in Malaysia.

4.5. Strengths and limitations

This study addresses a timely and policy-relevant demographic challenge in Malaysia, given the country's sustained below-replacement fertility and its implications for population aging, labor force sustainability, and reproductive health planning. Several methodological strengths should be acknowledged. First, the large sample size ($N = 968$) improved the precision of the estimates and supported stable multivariable analysis. Second, the multistage random sampling design strengthened participant selection within the sampled public primary care settings. Third, the questionnaire underwent comprehensive psychometric evaluation, including assessments of content validity, face validity, reliability, and factor structure, and was specifically adapted and validated for the Malaysian context before implementation. The application of the TPB as a structured theoretical framework also represents a strength, particularly as this is among the first studies to apply the model to investigate fertility intention in an urban Malaysian population. Finally, the systematic assessment of multicollinearity between ethnicity and religion, followed by comparison of alternative multivariable models to inform final model selection, strengthened the robustness and transparency of the analytical approach and contributed evidence from a Southeast Asian setting where similar investigations remain limited.

Nevertheless, certain limitations should be acknowledged. An important limitation is the clinic-based sampling frame, as participants were recruited

exclusively from public primary care clinics. Individuals who predominantly use private healthcare or have limited contact with public primary care may therefore be underrepresented and may differ in their socioeconomic characteristics and fertility intentions. In addition, the sample was predominantly women, adults aged 30–39 years, and government-sector employees, which may limit the extent to which the findings reflect the broader population of Kuala Lumpur. Although multistage and systematic random sampling were used to improve the representativeness of participants within the selected public primary care settings, generalization of the findings beyond adults attending public primary care clinics in Kuala Lumpur should be made with appropriate caution. Nonetheless, this population represents a substantively important group for reproductive health policy, given that public primary care serves as the principal point of healthcare contact for a large proportion of Malaysia's urban population, and the theoretical findings regarding the applicability of the TPB remain informative for understanding fertility decision-making within this widely accessed healthcare setting. The cross-sectional design prevents causal inference and cannot establish whether expressed intentions were ultimately realized; associations reported here, including the very large magnitude observed for age, should be interpreted as correlational rather than causal. Reliance on self-reported data may have introduced social desirability bias, particularly for sensitive topics such as reproductive intentions, as some participants may have overreported positive fertility intentions to align with perceived social, familial, or religious expectations. This study also did not directly measure several structural variables, including housing affordability, infertility history, childcare availability, and partner characteristics; some of the sociodemographic and psychosocial associations observed, particularly for income and employment, may partly reflect these unmeasured factors, and residual confounding cannot be excluded. Finally, this study did not examine whether TPB constructs were differentially associated with fertility intention across demographic subgroups such as sex, age, ethnicity, and, as a cross-sectional study, could not capture how fertility intentions change over time.

4.6. Future research directions

Several directions for future research follow from this study. Prospective longitudinal cohort studies following individuals or couples over time would clarify how fertility intentions evolve with life events such as marriage, childbirth, and employment changes and whether TPB constructs predict actual childbearing behavior rather than intention alone, while also testing whether these constructs operate differently across demographic subgroups such as sex, age, ethnicity, or parity. Expanding recruitment to rural populations, private healthcare users, and other Malaysian states would improve generalizability, while incorporating structural variables not measured here, including housing affordability, employment security, childcare availability, and gender equality within households, would provide a more comprehensive understanding of factors associated with fertility intention. Applying complementary theoretical frameworks, such as Demographic Transition Theory or Gender Equity Theory, and combining quantitative surveys with qualitative approaches such as interviews or focus groups, would further enrich understanding. Finally, future research should evaluate the effectiveness of interventions, including reproductive counseling, workplace policies, and community-based programs, in addressing factors associated with fertility intention and their potential implications for subsequent fertility outcomes.

5. Conclusions

This study found that a substantial proportion of adults attending public primary care clinics in Kuala Lumpur reported no intention to have children. Fertility intention was independently associated with attitude and subjective norm, alongside age, religion, and employment sector. Perceived behavioral control was not significantly associated with fertility intention, providing only partial support for the TPB. Parity, despite its theoretical importance in the wider fertility literature, was also not independently associated with fertility intention in the fully adjusted model, with its association attenuating following the inclusion of the TPB constructs.

This study contributes new empirical knowledge on fertility intention in a population and setting not previously examined using the TPB, thereby extending the theory's geographic and cultural reach beyond the Western and East Asian contexts where it has been most extensively tested. The findings both support and refine the theory's applicability: the significant associations for attitude and subjective norm are consistent with its core propositions in this new context, while the non-significant finding for perceived behavioral control suggests that the relative contribution of its constructs may vary across populations and settings.

These findings suggest that addressing low fertility intention in urban Malaysia requires attending to social-psychological factors alongside sociodemographic contexts in which fertility decisions are made, including reproductive counseling that addresses personal attitudes and family expectations, community-based engagement

of family and partner networks, and culturally responsive reproductive health messaging. The observed associations between fertility intention and psychosocial and sociodemographic factors suggest that future fertility policy in Malaysia should consider these dimensions as part of a broader, integrated approach to addressing fertility decline.

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Conflict of interest

The authors declare they have no competing interests.

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Ethics approval and consent to participate

The study was approved by the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (Protocol No.: 23-03624-SHC), and was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Prior to participation, eligible individuals were provided with a participant information sheet describing the study's purpose, procedures, and their right to withdraw at any point without penalty or consequence to the care they received at the clinic, before written informed consent was obtained from all participants. Participation was voluntary, and questionnaires did not collect any personal identifiers; responses were collected anonymously, and findings are reported only in aggregate form to preserve participant anonymity. All data were kept confidential and securely stored in password-protected files accessible only to the research team.

Consent for publication

Written informed consent for participation was obtained from all participants prior to enrollment. As the study involved anonymous self-reported questionnaire data with no identifying images, photographs, or personal information included in the manuscript, no additional consent for publication of individual data was required.

Availability of data

The data that support the findings of this study are not publicly available but may be made available by the corresponding author upon reasonable request, subject to relevant data-sharing requirements.

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