Research article

A Predictive Model for Determinants of Reproductive Behaviour in Şanlıurfa

Şanlıurfa'da Üreme Davranışının Belirleyicileri için Bir Öngörü Modeli

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Abstract

Aim: This study aims to predict the determinants of current and future reproductive behaviour in Şanlıurfa.

Material and Method: A cross-sectional study was conducted with 385 married women to examine the determinants of reproductive behavior. Data were collected with a survey form and evaluated with descriptive statistics and Structural Equation Model.

Results: The mean age was 29.91 ± 7.41, the mean pregnancies number was 4.04 ± 2.35, the mean number children was 3.38 ± 1.87, and the mean ideal children number was 3.59 ± 1.64. 39.2% of the women did not want another child. Women's age (β=0.42), education status of women (β=-0.15), marriage age (β=-0.19), contraceptive failure (β=0.16), and the number of ideal children (β=0.34) were found to be the predictors of the current fertility. The number of ideal children (β=0.59), contraceptive failure (β=-0.14), and the number of children (β=-0.70) are the most important predictors of future fertility ($p<0.05$).

Conclusion: As the number of women age and the ideal children number increases, the education level and marriage age decrease, and the children number increases. As the children number increases, the desire for future fertility decreases. The predictive model can guide the design, implementation, and evaluation of policies and programs for women's health professionals. More research is needed to examine how different factors
affect current and future fertility.

Keywords: Fertility, reproductive behavior, structural equation modelling, Türkiye

Özet

Amaç: Bu çalışma Şanlıurfa'da mevcut ve gelecekteki üreme davranışının belirleyicilerini tahmin etmeyi amaçlamaktadır.

Gereç ve Yöntem: Üreme davranışının belirleyicilerini incelemek amacıyla 385 evli kadınla kesitsel bir çalışma yapıldı. Veriler anket formu yardımıyla toplanmış, tanımlayıcı istatistikler ve Yapısal Eşitlik Modeli ile değerlendirilmiştir.

Bulgular: Ortalama yaş 29.91 ± 7.41, ortalama gebelik sayısı 4.04±2.35, ortalama çocuk sayısı 3.38±1.87 ve ortalama ideal çocuk sayısı 3.59±1.64 olarak belirlendi. Kadınların %39.2'si başka çocuk istemiyordu. Kadınların yaşı (β=0.42), kadınların eğitim durumu (β=-0.15), evlenme yaşı (β=-0.19), kontraseptif başarısızlık (β=0.16) ve ideal çocuk sayısı (β=0.34) mevcut doğurganlığın yordayıcıları olduğu görülürken, ideal çocuk sayısı (β=0.59), kontraseptif başarısızlık (β=-0.14) ve çocuk sayısı (β=-0.70) gelecekteki doğurganlığın en önemli yordayıcılarıdır ($p<0.05$).

Sonuç: Kadın yaşı ve ideal çocuk sayısı arttıkça eğitim düzeyi ve evlenme yaşı azalmakta, çocuk sayısı ise artmaktadır. Çocuk sayısı arttıkça gelecekte doğurgan olma isteği azalmaktadır. Tahmin modeli, kadın sağlığı profesyonellerine yönelik politika ve programların tasarlanmasına, uygulanmasına ve değerlendirilmesine rehberlik edebilir. Farklı faktörlerin mevcut ve gelecekteki doğurganlığı nasıl etkilediğini incelemek için daha fazla araştırmaya ihtiyaç vardır.

Anahtar Kelimeler: Doğurganlık, üreme davranışı, yapısal eşitlik modellemesi, Türkiye

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1. Introduction

Fertility is important in terms of community and family health as well as being a biological ability of women. Prolongation of life expectancy and decrease in fertility rates cause social and economic changes (Vander Borght & Wyns, 2018). The fertility rate has decreased from 3.2 to 2.5 per woman in the last three decades across the world (United Nations Department of Economic and Social Affairs, 2020). The fertility rate (FR) in Turkey has decreased from 2.38 to 1.88 in the last 20 years (TUIK, 2020b). Despite this, the FR of Turkey is higher than the FR of the European Union (Eurostat, 2021), the United States (US), and the United Kingdom (The World Bank, 2019). The FR in Turkey is 1.6 in the north, 2 in the west, 2.8 in the south, and 3.2 in the east (HUIPS, 2019). The eastern and southeastern regions have the highest FR. The highest FR in Turkey belongs to Şanlıurfa with 3.71. Also, Şanlıurfa has been the province with the highest fertility level in the last decade in Turkey (TUIK, 2021).

To our knowledge, the relationships between socioeconomic, and fertility preference variables affecting current and future fertility in Turkey have not yet been investigated. Nurses should know the factors affecting the fertility level of the society they live in, plan and implement interventions to protect reproductive health, and evaluate their effects. Therefore, an in-depth analysis of the variables affecting the fertility dynamics and decisions of these women is required (Bashir & Guzzo, 2021). This study aims to predict the determinants of current and future reproductive behavior in Şanlıurfa.

1.2. The theoretical framework

The theoretical framework of previous empirical studies examining fertility is that fertility preference variables and intervening variables (such as the use of contraception) affect fertility directly, while socioeconomic variables (such as education, and place of residence) indirectly affect fertility (Abdelghany et al., 2020; Akintayo et al., 2021; Eser et al., 2016; Hassneen et al., 2019; Islam et al., 2016). Consistent with this theoretical framework, our approach tests the socioeconomic variables and fertility preference effect on reproductive behavior with the Structural Equation Model (SEM). The predictive model includes sociodemographic variables, fertility preference variables, and two outcome variables (child number and desire for children). In Figure 1, each one-way path represents the hypotheses of the study in the predictive model:

H_1 = Socioeconomics affects fertility preferences.
H_2 = Fertility preferences affect current fertility.
H_3 = Fertility preferences affect future fertility.
H_4 = Socioeconomics affect current fertility
H_5 = Socioeconomics affects future fertility.
H_6 = Current fertility affects future fertility.

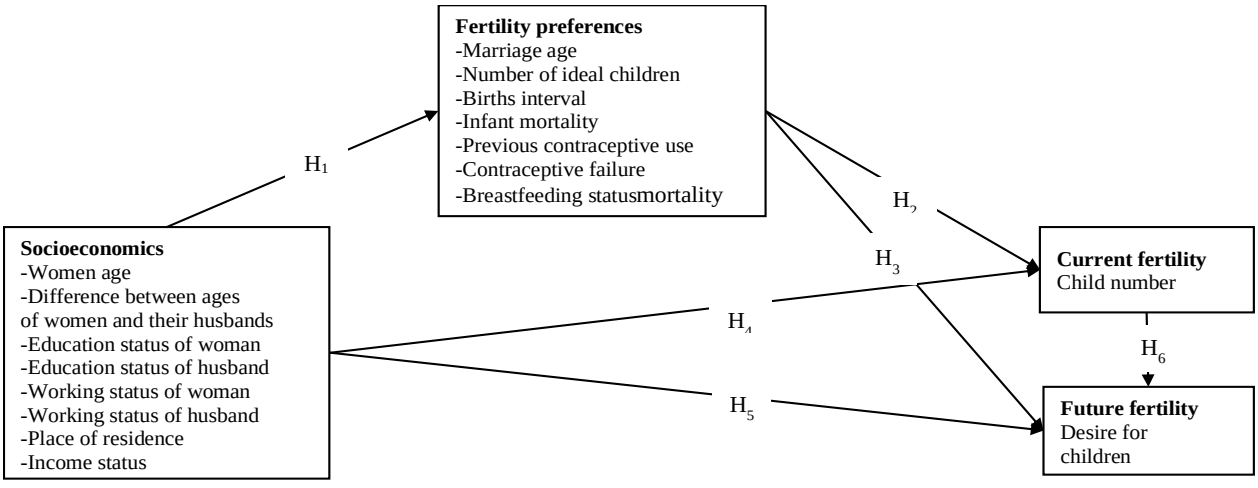

Figure 1. Predictive model and research hypotheses

2. Method

The cross-sectional study.

2.1. Sample

According to the Turkish Statistical Institute, there were 60623 births (N) in Şanlıurfa in 2019 (TUIK, 2020a). The number of individuals sampled was calculated as 382 (n) using the sampling formula whose target population is known (Özdamar, 2017). The sample was calculated by taking the frequency of occurrence of the event (p) as 0.50, the frequency of absence (1-p) as 0.50, the margin of error as 0.05, and the t value as 1.96.

$$n = \frac{\mathrm{N.t^2p.q}}{d^2(N-1) + t^2.p.q}$$

A total of 405 married women were conducted between November 2020 and May 2021 at an obstetrics and gynecology clinic in Şanlıurfa, Turkey. The inclusion criteria were to be between the ages of 18-49, not to be diagnosed with infertility, not to have speech and comprehension disabilities, and to participate in the study voluntarily. Foreign nationals, those diagnosed with infertility, unmarried women, and women who did not agree to participate were excluded. 20 data with incomplete answers were deleted, and thus, data belonging to 385 women were analyzed.

2.2. Measurements

Data were collected through survey using the convenience sampling method in the obstetrics and gynecology clinic. The survey was created by researchers based on the literature (Abdelghany et al., 2020; Akintayo et al., 2021; Eser et al., 2016; Hassneen et al., 2019; Islam et al., 2016). The survey includes 43 questions that women's socioeconomics such as age, education level and fertility characteristics such as number of children and family planning method used.

The independent variables of this study are sociodemographic and fertility characteristics. The dependent variables are current fertility and future fertility.

2.3. Data Analysis

If the absolute values of the skewness and kurtosis coefficients of the variables are below 10, the data conform to the normal distribution (Kline, 2011). Since the Variance Inflation Factor (VIF) values of the variables are less than 10, there is no problem with multicollinearity between the variables. The Maximum Likelihood technique and the Bootstrap estimation method were used in SEM. To determine the fit of the model, the chi-square to degrees of freedom ratio ($\chi 2/df$), the goodness of fit index (GFI), normed fit index (NFI), comparative fit index (CFI), incremental fit index (IFI), and root mean squared error of the approximation (RMSEA) was used (Gürbüz, 2019). The data were analyzed in SPSS (Statistical Package for the Social Sciences; IBM SPSS Statistics, Chicago, IL, USA) 22 and AMOS (Analysis of Moment Structures) 21.

2.4. Ethics approval

Approval was obtained from the Harran University Clinical Research Ethics Committee (23.11.2020 date, HRU/20.20.23 number) and the institution where the study was carried out. In addition, informed consent was obtained from the participants.

3. Results

Characteristics of women

While 79.5% of the women are housewives, 51.2% of the spouses are self-employed. 68.3% of the women live in urban areas. The mean age was 29.91 ± 7.41, the mean number of households is 5.96 ± 2.09. The income of 49.9% of women is equal to their expenses. The mean marriage age was 19.42

± 3.48, the mean pregnancies number was 4.04 ± 2.35, and the mean number children was 3.38 ± 1.87. Less than two years have passed between the last two deliveries of 30.9% of the women. 9.1% of the women stated that they lost at least one baby, 47.5% of them stated that they got pregnant at least once despite protection, and 29.3% of them did not plan their last pregnancy. While 45.5% of them did not use any contraceptive methods before, 68.6% stated that they are currently protected with a modern method. 5.2% of the women have a history of abortion. 31.9% of the women are currently breastfeeding, and 28.8% are smokers. While 39.2% of the women did not want another child, 29.6% declared that they were undecided. The mean ideal children number was 3.59 ± 1.64 (Table 1).

Table 1. Characteristics of women (n= 385)

Variables			Mean ± SD / n (%)	VIF
Socioeconomics	Women age		29.91 ± 7.41	2.461
	Difference between the ages of women and their husbands		4.43 ± 8.30	1.399
	Education status of women	Literate	94 (24.4)	1.668
		Primary school	174 (45.2)	
		Middle school	86 (22.3)	
		High school	43(11.2)	
		University	30 (7.8)	
	The education status of the husband	Literate	94 (24.4)	1.425
		Primary school	174 (45.2)	
		Middle school	86 (22.3)	
		High school	43(11.2)	
		University	30 (7.8)	
	Working status of women	Working	79 (20.5)	1.175
		Not working	306 (79.5)	
	Working status of husband	Officer	56 (14.5)	1.160
		Worker	132 (34.3)	
		Self-employment	197 (51.2)	
	Place of residence	Urban	263 (68.3)	1.174
		Rural	122 (31.7)	
	Number of households		5.96 ± 2.09	5.374
	Income status	Bad	141 (36.6)	1.148
		Mideum	192 (49.9)	
		Good	52 (13.5)	
Fertility preferences	Married age		19.42 ± 3.48	1.533
	The ideal number of children		3.59 ± 1.64	2.445
	Births interval		1.56 ± 0.60	1.329
	Infant mortality		0.10 ± 0.35	1.086
	Previous contraceptive use	Not use	175 (45.5)	1.124
		Modern method	162 (42.1)	
		Traditional method	48 (12.5)	
	Contraceptive failure	No	202 (52.5)	1.644
		Yes	183 (47.5)	
	Breastfeeding status	Not breastfeeding	262 (68.1)	1.224
		7 months and above	108 (28.1)	
		Exclusive breastfeeding	15 (3.9)	
Current fertility	Child number		3.38 ± 1.87	7.116
Future fertility	Desire for children	No	151 (39.2)	1.849
		I'm undecided	114 (29.6)	
		Yes	120 (31.2)	
Total			385 (100)	

The model fit statistics

In the final model (Figure 2), acceptable values were achieved in fit indices (x^2/df =1.570, CFI=0.97, GFI=0.96, IFI=0.97, NFI=0.94, and RMSEA=0.039). These results show that the measured variables adequately describe the model (Bayram, 2013). Since the factor loads of the "working status of women" and "infant mortality" variables were not significant, they were excluded from the model. Goodness-of-fit values are at an acceptable level (x^2/df=1.071, CFI=0.99, GFI=0.99, IFI=0.99, NFI=0.98, and RMSEA=0.014).

Direct, indirect, and total effects of the final model

Woman's age (β=0.42), education status of the woman (β=-0.15), marriage age (β=-0.19), ideal children number (β=0.34), and contraceptive failure (β=0.16) were found to have a direct effect on current fertility (p<0.05). All these variables together explain 63% of the variance in the number of children. On the other hand, the age of the woman (β=0.10), the difference between the ages woman and their husband (β=0.04), the education status of the woman (β=-0.15), the working status of the husband (β=0.05), income level (β=-0.06), and marriage age (β=-0.10) indirectly affect the number of children (p<0.05; Figure 2; Table 2).

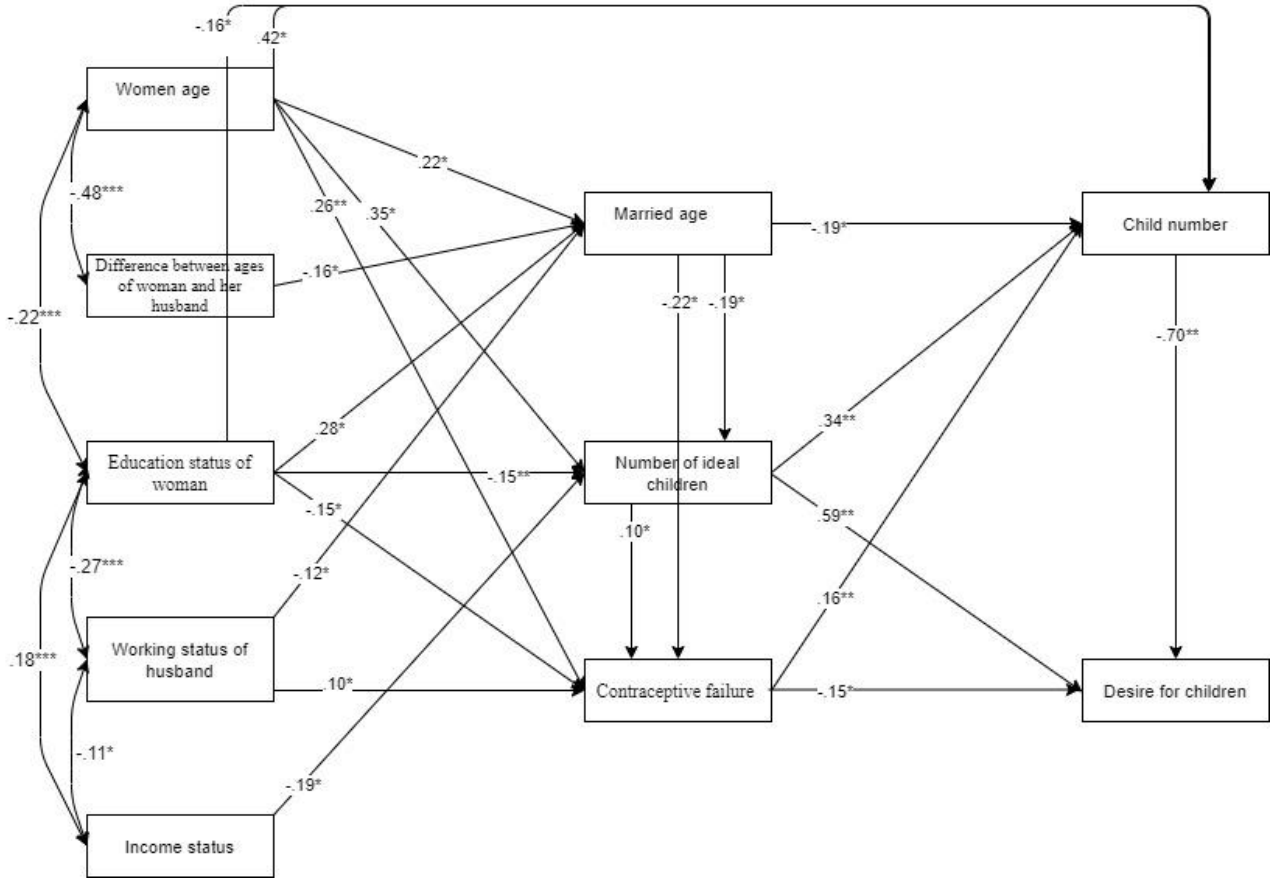

Figure 2. Standardized path coefficients of the final model
*p < 0.05; **p < 0.01; ***p < 0.001.

Table 2. Standardized path coefficents of the final model (*n*= 385)

Endogenous variable		Exogenous variable	β	CR (P)	SMC	SDE (*p*)	SIE (*p*)	STE (*p*)
Married age	←	Woman age	0.22	4.138***	0.18	0.22*		0.22*
	←	Difference between the ages of women and their husbands	-0.15	-2.986**		-0.15**		-0.15**
	←	Education status of women	0.27	5.578***		0.27*		0.27*
	←	Working status of husband	-0.11	-2.487*		-0.11*		-0.11*
Number of ideal children	←	Woman age	0.35	7.276***	0.23	0.35*	-0.04*	0.30*
	←	Difference between the ages of women and their husbands					0.02**	0.02**
	←	Education status of woman	-0.15	-3.077**		-0.15**	-0.05*	-0.20**
	←	Working status of husband					0.02*	0.02*
	←	Income status	-0.18	-4.119***		-0.18*		-0.18*
	←	Married age	-0.18	-3.852***		-0.18*		-0.18*
Contraceptive failure	←	Woman age	0.25	4.995***	0.21	0.25**		0.25*
	←	Difference between the ages of women and their husbands					0.03**	0.03**
	←	Education status of woman	-0.14	-2.859**		-0.14*	-0.08*	-0.22*
	←	Working status of husband	0.10	2.194*		0.10*	0.02*	0.13*
	←	Married age	-0.21	-4.327***		-0.21*		-0.21*
	←	Number of ideal children	0.10	2.011*		0.10*		0.10**
Child number	←	Woman age	0.42	11.595***	0.63	0.42*	0.10**	0.52**
	←	Difference between the ages of women and their husbands					0.04**	0.04**
	←	Education status of woman	-0.15	-4.506***		-0.15*	-0.15**	-0.31*
	←	Working status of husband					0.05*	0.05*
	←	Income status					-0.06*	-0.06*
	←	Married age	-0.19	-5.486***		-0.19*	-0.10*	-0.29*
	←	Number of ideal children	0.34	9.836***		0.34**		0.34**
	←	Contraceptive failure	0.16	4.742***		0.16**		0.16**
Desire for child	←	Woman age			0.41		-0.22**	-0.22**
	←	Difference between the ages of women and their husbands					-0.02**	-0.02**
	←	Education status of women					0.13*	0.13*
	←	Working status of husband					-0.04**	-0.04**
	←	Income status					-0.06*	-0.06*
	←	Married age					0.13*	0.13*
	←	Number of ideal children	0.59	12.038***		0.59**	-0.26**	0.32*
	←	Contraceptive failure	-0.14	-3.334***		-0.14*	-0.11**	-0.26*
	←	Child number	-0.70	-13.140***		-0.70**		-0.70**

β: Standardized Regression Weight; CR: Critical Ratio; SMC: Squared Multiple Correlations; SDE: Standardized Direct Effects; SIE: Standardized Indirect Effects; STE: Standardized Total Effects. *P <.05; ** P< .01; *** P < .001.

The number of ideal children (β=0.59), contraceptive failure (β=-0.14), and the number of children (β=-0.70) directly affect future fertility (p<0.05). All these variables together explain 41% of the variance in the desire to have a child. Woman age (β=-0.22), the difference between the age of the women and their husbands (β=-0.02), the education status of the woman (β=-0.13), working status of the husband (β=-0.04), income (β=-0.06), marriage age (β=0.13), the ideal children number (β=-0.26), and contraceptive failure (β=-0.11) indirectly affect the desire to have a child (p<0.05; Figure 2; Table 2).

4. Discussion

Globally, the fertility rate is declining (UNDESA, 2021). Although the fertility rate in Turkey is very close to the renewal level (TUIK, 2021), Şanlıurfa seems to be the province that has increased the fertility level of Turkey the most. Our results show that the woman's age, education level, marriage age, the number of ideal children, and contraceptive failure are the most important predictors of current fertility, while the number of ideal children, contraceptive failure, and the number of children are the most important predictors of future fertility.

Our results show both direct and indirect correlations between age and current fertility; revealing an indirect relationship with future fertility. In addition, as the age difference between the woman and her husband increases, the number of children also increases. On the other hand, Abdelghany et al. (2020) found a negative relationship between the age difference between the woman and her husband and the birth number. The children number increasing with age in our study is reasonable and consistent with a study (Lai, 2021). In the present study, similar to Turkey (HUIPS, 2019), it was determined that the children number increased as the educational status of women decreased. Women's educational attainment is a strong predictor of reproductive health in all 29 Sub-Saharan African countries (Woldegiorgis et al., 2018).

Our study further revealed that the working status of the husband and income status affect current and future fertility weakly and indirectly, while the working status of women and the number of households do not. The relationship between fertility and economic variables is contradictory in the literature. In a study of 141 countries, the relationship between FR and economy (Gross Domestic Product, GDP, per capita) was examined. A very weak (or nonexistent) relationship between FR and GDP has been reported in Western and Eastern Europe, while GDP declines as FR increases in Latin America, Sub-Saharan Africa, Arab countries, and Asia (Götmark & Andersson, 2020). In European Union countries, fertility decline is strongly associated with an unemployment increase (Matysiak et al., 2021). Research reveals that FR is affected by poverty and economic recession, and these lead to further changes in FR (Anser et al., 2020).

In our study, it was determined that the children number directly increased as the marriage age of women decreased and the number of ideal children increased. As the marriage age and the ideal children number increase, the desire for children increases. Similarly, in the United States, postponing marriage until after age 30 is associated with lower parenting rates (Nitsche & Hayford, 2020). It has been determined that European and American women have fewer children than the number of ideal children. In addition, the overall intention-fertility difference was found to be the highest among women with higher education (Beaujouan & Berghammer, 2019).

Using effective contraception is important to prevent unwanted pregnancies (Lee & Burke, 2019). The present study revealed that as contraceptive failure increased, the children number increased and the desire for children decreased. In a study examining the fertility preferences of 53 countries, the average contraceptive failure rate was found to range from 5% in regions with high sterilization to 37% in regions with low conventional methods (Bongaarts & Casterline, 2018). The fact that almost one of every two women in our study has a history of contraceptive failure at least once and one out of every three women states that they are not planning their last pregnancy shows that the rate of contraceptive failure in our

sample is even higher than the rate in countries where traditional methods are used at a low level. This high level of unmet need for contraception was counted as an indication of a worsening situation in terms of family planning and thus a call to action in the study of Målqvist et al. (2018). On the other hand, in a study, it was determined that having many children strengthens the family, boys have old-age insurance, and voluntary abortion is considered a sin (Eroğlu et al., 2021). It seems possible that women experience unwanted pregnancies and their fertility increases as a result of contraceptive failure.
In the present study, it was determined that as the children number increased, the desire for fertility decreased in the future. According to a cohort study, women were found to have fewer children than they expected. This was explained by the low fertility level despite high fertility intentions. It has been determined that this difference becomes larger as the education level of women increases (Beaujouan & Berghammer, 2019).

4.1. Limitations

This study has some limitations. The first is the design of the study and its limited sample size. Therefore, it may not be correct to generalize the results. Second, this study may contain a selection bias because women were selected to participate in the study from only a single hospital. Third, because the study used a self-report instrument to collect data, the data are based on participants' statements.

5. Conclusion

Women's age is the most important determinant of current fertility. The children number is the most important determinant of future fertility. As the number of women age and the ideal children number increases, the education level and marriage age decrease, and the children number increases. As the children number increases, the desire for future fertility decreases. We believe that this situation will reach a more optimum level with the increase in the educational status of women.

Nurses should be aware of the factors affecting the fertility level of the society they live in, plan and implement interventions to protect reproductive health and evaluate their effects. The predictive model can guide the design, implementation and evaluation of policies and programs for women's health professionals. More research is needed to examine how different factors affect current and future fertility.

Financial Support

No financial support has been received for this research.

Conflict of Interest

No conflict of interest has been declared by the authors.

Ethical Statement

It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited. Ethics Committee Approval 23.11.2020 date, HRU/20.20.23 number.

Authorship Contributions: *First author 51%, second author 49%*

Study conception and design*: AT, ŞT;* ***Data collection****: ŞT;* ***Data analysis and interpretation****: AT;* ***Writing manuscript****: AT, ŞT;* ***Critical revision of the manuscript****: AT*

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