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Determinants of unmet need for family planning: Evidence from the 2018 Turkey Demographic and Health Survey

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Abstract

Unmet need for family planning is a valuable concept to indicate the discrepancy between women's fertility preferences and contraceptive use. Unmet need may lead to unintended pregnancies and unsafe abortions. These may result in health deterioration and reduced employment opportunities for women. The 2018 Turkey Demographic and Health Survey report indicated that the estimated unmet need for family planning doubled from 2013 to 2018, returning to the high levels of the late 1990s. Considering this unfavourable change, this study aims to investigate the determinants of unmet need for family planning among married women of reproductive age in Turkey by using the 2018 Turkey Demographic and Health Survey data. Logit model estimations revealed that women who were at older ages, more educated, wealthier, and had more than one child were less likely to have unmet need for family planning. Employment statuses of women and their spouses and place of residence were significantly associated with unmet need. Results emphasised that training and counselling to enhance the use of family planning methods should effectively target young, less educated, and poor women.

Introduction

The concept of unmet need for family planning (FP) has emerged from the observation that women who want to space or limit births are not using any contraception. According to global estimates, out of 1.9 billion women of reproductive age (15–49 years) 164 million were considered to have an unmet need for FP in 2021 (United Nations Department of Economic and Social Affairs, Population Division, 2022). Unmet need for FP is the main cause of unintended pregnancies, which may lead to unsafe abortion and have an adverse impact on women's sexual and reproductive health (USAID, 2009; Ahmed *et al.*, 2012; Clealand *et al.*, 2012; Sedgh *et al.*, 2016; Metheny and Stephenson, 2017). Besides that, mistimed pregnancies may limit women's participation in employment and social life, leading them to fall into the poverty trap and ill health (Ahmed *et al.*, 2012; Mosha *et al.*, 2013; Kabagenyi *et al.*, 2014). Therefore, measuring unmet need for FP would provide information for evaluating population policies and programmes and determining priorities for more effective FP and reproductive health services to improve women's health and well-being (Bradley & Casterline, 2014).

Measuring the discrepancy between women's fertility preferences and contraceptive use has been discussed predominantly among population policies related to fertility. The surveys on

knowledge, attitude, and practices (KAP) of FP were introduced in some of the developing parts of the world in the 1960s enabling the measurement of the magnitude of the difference between reproductive preferences and actual contraceptive practices (called KAP-gap) (Bradley & Casterline, 2014). The World Fertility Survey (WFS) and the Contraceptive Prevalence Survey (CPS) programmes started to cover fertility and contraceptive use in developing countries in the 1970s and run through 1984 (Anderson & Cleland, 1984). The term KAP gap was then replaced with the unmet need for FP in a study by Westoff (1978). The Demographic and Health Surveys (DHS) were more comprehensive than the WFS and the CPS and have been conducted since 1984 (Bradley & Casterline, 2014).

The definition of unmet need underwent multiple modifications between 1970 and 2010 to take into account the status of pregnant and postpartum amenorrhoeic women as well as the women's fecundity condition. Since these changes made the unmet need algorithm more complex, a simplified version was developed (Bradley *et al.*, 2012; Bradley & Casterline, 2014). Unmet need refers to "women who (1) are not pregnant and not postpartum amenorrhoeic and are considered fecund and want to postpone their next birth for 2 or more years or stop childbearing altogether but are not using a contraceptive method, or (2) have a mistimed or unwanted current pregnancy, or (3) are postpartum amenorrhoeic and their last birth in the last 2 years was mistimed or unwanted" (Hacettepe University Institute of Population Studies, 2019, p. 86). Accordingly, women who are fecund but not pregnant/not postpartum amenorrhoeic and not using contraceptives are classified as having unmet need for spacing if they want to have births at least two years later or are undecided when/whether they want another child; they are classified as having unmet need for limiting if they want to stop childbearing (Bradley *et al.*, 2012; Croft *et al.*, 2018). In addition, women who are pregnant/postpartum amenorrhoeic and not using contraceptives are also taken into account based on whether they had wanted their current pregnancy/the last birth that occurred in the last two years or not. Within this group, those women who did not want their current pregnancy/last birth at all are classified as having an unmet need for limiting, and those who wanted their current pregnancy/last birth later are classified as having an unmet need for spacing (Bradley *et al.*, 2012; Croft *et al.*, 2018).

Unmet need is most common in low and middle-income countries, particularly in Sub-Saharan Africa, Asia, the Middle East, and the Caribbean (Cleland *et al.*, 2012; Sedgh *et al.*, 2016; Wulifan *et al.*, 2016). Inadequate or wrong knowledge, concerns regarding side effects and health risks about contraceptive methods due to socio-economic (Cleland *et al.*, 2012; Sedgh *et al.*, 2016; Wulifan *et al.*, 2016; Metheney & Stephenson, 2017), cultural and religious factors (Najafi-Sharjabad *et al.*, 2013; Adedze & Osei-Yeboah, 2019; Asif & Pervaiz, 2019; Msoka *et al.*, 2019), and/or access problems (Bertrand *et al.*, 1995; Shiferaw *et al.*, 2017; Adedze and Osei-Yeboah, 2019; Yücel *et al.*, 2020) limit contraceptive use and therefore affects the percentage of women having unmet need for FP. Several studies have identified the determinants of unmet need among women of reproductive age (15–49 years) by using data from the DHS fielded primarily in low- and middle-income countries (Oginni *et al.*, 2015; Metheney & Stephenson, 2017; Nzokirishaka & Itua, 2018; Asif & Pervaiz, 2019; Solanke *et al.*, 2019; Wulifan *et al.*, 2019; Ahinkorah *et al.*, 2020; Mulenga *et al.*, 2020; Yalew *et al.*, 2020; Asif *et al.*, 2021; Yaya *et al.*, 2021; Agyekum *et al.*, 2022; Alie *et al.*, 2022; Namukoko *et al.*, 2022). These determinants generally include the age of women, parity, education and employment statuses (both men and women), wealth, place of residence, women's autonomy to make decisions and sources of knowledge about FP. Although there is not much work in developed countries, particularly in Europe and North America where contraceptive prevalence was high and unmet need was low since the 1970s (Cleland *et al.*, 2014; United Nations Department of Economic and Social Affairs, Population Division, 2022), attention has been given to contraceptive use and its differences across social and economic subgroups (Grady *et al.*, 2015; Jackson *et al.*, 2016; Daniels & Abma, 2020).

Contraceptive use (modern and traditional methods for FP) and fertility preferences in Turkey have been monitored via national surveys; 1978 Turkish Fertility Survey was succeeded by 1983

and 1988 Turkish Population and Health Surveys, and the Turkish Demographic and Health Survey (TDHS) has been conducted every five years since 1993 (Hacettepe University Institute of Population Studies, 2023). The TDHS series showed that the use of any contraceptive method among currently married women aged 15–49 increased from 62.6% to 73.5% between 1993 and 2013 due to an increasing trend in the use of modern methods including "male and female sterilization, injectables, intrauterine devices (IUDs), contraceptive pills, implants, female and male condoms, lactational amenorrhoea method and emergency contraception" (Hacettepe University Institute of Population Studies, 2019, p. 82). On the other hand, the use of traditional methods including "periodic abstinence, withdrawal and other traditional methods" (Hacettepe University Institute of Population Studies, 2019, p. 92) has been decreasing since 1993. The increasing trend in the use of modern methods slowed down between 2013 (47.4%) and 2018 (49%) and a sharp decline in the use of traditional methods was observed between 2013 (26%) and 2018 (20.9%). Since the sharp decline in traditional method use was not counterweighed by the limited rise in modern methods, the use of any contraceptives among currently married women aged 15–49 decreased from 73.5% in 2013 to 69.8% in 2018. Consistent with the trend observed in the use of any contraceptives, unmet need for FP among currently married women aged 15–49 decreased from 15% in 1993 to 6% in 2013, but increased to 12% in 2018 (Hacettepe University Institute of Population Studies, 2019). This 12% accounts for approximately 1.6 million women of reproductive age having unmet need in Turkey and is almost as high as the level of the late 1990s (Çavlin & Çağatay, 2020). This unfavourable situation calls for a critical inquiry into the determinants of unmet need for FP in 2018 in Turkey.

Only three studies, according to the authors' knowledge, compared the level and factors associated with unmet need for FP in Turkey. Ergöçmen and Bozbeyoğlu (2005) estimated the unmet need for FP among married women aged 15–49 by using data from 2003 TDHS and employed a different approach in which women who were using traditional methods but had the intention to use modern contraceptives were included in the unmet category. The remaining two studies were held in a single province, which focussed on differences in unmet need for FP between rural versus urban areas among married women aged 15–49 (Ozdemir et al., 2019), and urban versus socioeconomically peripheral settlements among ever-married women aged 15–49 (Dinç et al., 2007). This study, hence, constitutes an initial attempt to investigate the determinants of unmet need for FP on a national scale. Therefore, the study aims to understand the factors associated with unmet need for FP among married women at reproductive age in Turkey. The contributions of the study are twofold: (1) the revised definition of unmet need was used and (2) the data obtained from the recent national survey (2018 TDHS) for married women who were in need of FP were employed. The results of the study will help identify the groups of women more prone to unmet need so that the necessary policy actions can be developed to tackle adverse outcomes of unmet need for FP including unwanted pregnancies, unsafe abortions and maternal mortality.

Methods

Data

The data set was obtained from the 2018 TDHS, which is a nationally representative survey of women of reproductive ages (15–49). TDHS has a cross-sectional design and has been conducted by the Hacettepe University Institute of Population Studies once every 5 years. The survey gathers data on household characteristics, characteristics of women, child and maternal health, women's sexual and reproductive health and fertility, and nutritional status of women and children. The 2018 TDHS covered a sample of 7346 women of reproductive ages (15–49). Among them, women who were Turkish citizens, married, at least 18 years old, in need of FP and had non-missing

observations on variables were included in this study. This leads to a 3743 weighted sample of women.

TDHS includes unmet need for FP variable (V626A) based on the revised definition. The variable has seven categories: (1) never had sex (2) unmet need for spacing (3) unmet need for limiting (4) using for spacing (5) using for limiting (6) no unmet need and (7) infecund, menopausal. "No unmet need" category includes "married women who are not using contraceptives and are pregnant and wanted the current pregnancy or postpartum amenorrheic and wanted their last birth or fecund and want another child within two years" (Croft *et al.*, 2018, p. 7.40). Women in categories 4 and 5 are composed of those who were using either modern or traditional methods to delay or stop childbearing, respectively, and so they had met need for FP (Hacettepe University Institute of Population Studies, 2019). Categories 1, 6 and 7 were excluded to obtain the sample of women in need of FP which comprises the total demand for FP. Finally, categories 2 and 3 were merged to define women having unmet need for FP. The binary dependent variable representing the status of unmet need got the value of 1 for women who had unmet need for FP (categories 2 and 3) and 0 for those who had met need (categories 4 and 5).

The analysis employed the most commonly used explanatory variables in the literature. The socio-demographic variables included the woman's age group (18–24, 25–34 and 35–49), number of children (0, 1–3 and 4+), household size, education level of the woman (no education, primary education, secondary education and high school and higher), spouse's education level (primary education, secondary education and high school and higher), employment statuses of the woman and her spouse (employed vs. not employed), wealth quintile (lowest, second, middle, fourth, and highest), place of residence (urban vs. rural) and region (NUTS-1). The variables used to control for the women's autonomy were participation in decision-making about woman's health care (woman only, woman and spouse, spouse only, others) and having talked about reproductive health or FP with spouse (yes or no). In addition, variables on exposure to FP messages, use of internet and watching women's programs on tv were also included in the estimation to control for the effect of possible sources of information on FP and reproductive health on unmet need for FP. If a woman used internet regularly or irregularly, the use of internet variable took the value of 1 and 0 otherwise. Similarly, if a woman watched women's programs on television regularly or irregularly, the variable took the value of 1 and 0 otherwise. Exposure to FP from each source was separately asked in the TDHS questionnaire. Answers to these questions were merged into two main variables: exposure through media resources and other resources. Exposure to FP messages through media resources -radio, tv, newspaper and mobile phone- was defined as a binary variable (yes or no). Similarly, exposure to FP messages through other resources — internet, flyer, billboard, family doctor, and others — was also defined as a binary variable (yes or no).

Descriptive statistics of the variables are shown in Table 1. The complex sample design of the TDHS was taken into account and the sampling weight was used when presenting the descriptive statistics and the results of the econometric modelling. 13.79% of women of reproductive age who were in need of FP had unmet need.

Model

Since the dependent variable Y is a binary variable taking the values of 0 (met need) and 1 (unmet need), the following Logit model was constructed to determine the factors associated with the probability of having unmet need for women who were in need of FP.

$$Y_i = \alpha + X_i\beta + \varepsilon$$

In the equation above, dependent variable Y represents the status of unmet need. X represents the matrix of explanatory variables mentioned in the Data section. β is the vector of coefficients corresponding to explanatory variables. ϵ is the error term assumed to follow logistic distribution. The probability of having unmet need, p_i, conditional on X is defined as follows:

Table 1. Descriptive statistics of variables

Variables	%	Variables	%
Unmet need	13.79	Wealth quintile	
Age groups		Lowest	14.26
18–24	7.45	Second	18.46
25–34	34.38	Middle	21.24
35–49	58.17	Fourth	22.51
Number of children		Highest	23.53
0	2.41	Region (NUTS-1)	
1–3	81.40	Istanbul	20.66
4+	16.19	West Marmara	4.43
Education level of woman		Aegean	12.03
No education	11.36	East Marmara	10.54
Primary education	41.10	West Anatolia	11.02
Secondary education	16.84	Mediterranean	11.83
High school and higher	30.70	Central Anatolia	5.25
Education level of spouse		West Black Sea	5.60
Primary education	35.20	East Black Sea	2.32
Secondary education	18.20	Northeast Anatolia	2.31
High school and higher	46.59	Central East Anatolia	4.34
Woman is Employed	29.22	Southeast Anatolia	9.66
Spouse is Employed	92.69	Place of residence	
Decision maker for woman's health care decision		Urban	77.04
Woman alone	37.09	Heard information on reproductive health or FP from other sources[b]	32.60
Woman and Spouse	58.73	Talked to spouse about reproductive health or FP	5.96
Spouse alone	4.01	Use of internet	68.95
Others	0.17	Watch women's programs on tv	52.27
Heard information on reproductive health or FP from media sources[a]	17.87	Household size[c]	4.72
			(1.72)

Note: Weighted sample size is 3743. Sampling weight was used to obtain percentages, mean value, and standard deviation.
[a]Media sources include radio, tv, newspaper, and text messages on mobile phones.
[b]Other sources include internet, flyer, billboards, family doctors, and others.
[c]Mean of the variable is shown. Standard deviation is given in the parenthesis.

$$P(Y_i = 1 | X_i) = p_i = \frac{\exp(\alpha + X_i \beta)}{1 + \exp(\alpha + X_i \beta)}$$

where the right-hand side of the equality represents the logistic cumulative distribution function.

Modelling the probability of unmet need as shown above ensures that $0 < p_i < 1$ (Cameron & Trivedi, 2005). The logit model was estimated via Maximum Likelihood method. Then, average

marginal effect (AME) of each explanatory variable in the model was obtained by computing the marginal effects for each observation and taking the sample average of them (Cameron & Trivedi, 2005). Two different models were estimated. The first model included the socio-demographic variables while participation in decision-making, use of internet, watching tv and variables on exposure to FP were added to the second model. The AME of each explanatory variable is shown in Table 2.

Results

Both models showed similar results (Table 2). Older women were almost 8 percentage points ($p < 0.05$) less likely to have unmet need than young women (18–24 years old). Women having 1–3 or 4+ children were statistically significantly less likely to have unmet need than women having no child. The probability of having unmet need statistically significantly decreased when the education level of women increased. Specifically, women with high school and higher education level were almost 9 (Model 2) to 9.6 (Model 1) percentage points less likely to have unmet need than women without any education level. Employed women were 2.5 to 2.6 (Model 1 and Model 2, respectively) percentage points less likely to have unmet need, but it was significant only at 10% level. When the spouse was employed, the probability of unmet need statistically significantly decreased by almost 9 percentage points. Wealth indicator was also found to be statistically significant. Women living in wealthier households were less likely to have unmet needs than women living in households in the lowest wealth category. The most remarkable difference was observed between the lowest and the highest wealth categories. Living in an urban area positively contributed to the likelihood of having unmet need. Women living in East Marmara, Central Anatolia, and West Black Sea regions were less likely to have unmet need than women living in Istanbul region. Women in Southeast Anatolia was also less likely to have unmet need in the second model, but the effect was significant only at 10% level. None of the effects of additional variables in the second model were statistically significant.

Discussion

This study examined the factors associated with unmet need for FP among married women aged 18–49 in Turkey. Regression analysis revealed that older women (age ≥ 25) were less likely to have unmet need. This is in line with prior studies conducted in low- and middle-income countries that identified woman's age was negatively associated with unmet need (Oginni *et al.*, 2015; Wulifan *et al.*, 2016; Nzokirishaka & Itua, 2018; Asif & Pervaiz, 2019; Solanke *et al.*, 2019; Tadele *et al.*, 2019; Wulifan *et al.*, 2019; Mulenga *et al.*, 2020; Yaya *et al.*, 2021 for Mozambique; Alie *et al.*, 2022; Namukoko *et al.*, 2022). Since women may attain their ideal family size as they get older, the likelihood of having unmet needs decreases with age (Namukoko *et al.*, 2022). The 2018 TDHS reports that almost 97.4% of women heard about at least one contraceptive method, and there was a negligible variation among different age groups (Hacettepe University Institute of Population Studies, 2019). However, having heard about any contraceptive method does not guarantee its use and that women have enough knowledge about contraceptives. In Turkey, contraceptive use increased as women get older (Hacettepe University Institute of Population Studies, 2019). Therefore, FP knowledge through health education programs and counselling should be provided to increase contraceptive use among young women.

This study found a negative association between parity and unmet need for FP; a lower likelihood of unmet need was realized among women having at least one child compared to women without children. This finding is consistent with the results of the 2018 TDHS, which showed that more than 70% of married women with at least one child used a contraceptive method whereas only 20.7% of women without any child used contraception (Hacettepe

Table 2. Average Marginal Effects (AMEs) of explanatory variables obtained from the Logit model estimations

	Model 1	Model 2
Age groups		
25–34	−0.084**	−0.085**
	(0.034)	(0.034)
35–49	−0.080**	−0.084**
	(0.036)	(0.036)
Number of children		
1–3	−0.143***	−0.144***
	(0.051)	(0.052)
4+	−0.128**	−0.131**
	(0.055)	(0.057)
Household size	−0.004	−0.004
	(0.005)	(0.005)
Education level of woman		
Primary education	−0.086***	−0.079***
	(0.025)	(0.024)
Secondary education	−0.072**	−0.063**
	(0.030)	(0.030)
High school and higher	−0.096***	−0.086***
	(0.030)	(0.030)
Education level of spouse		
Secondary education	−0.014	−0.013
	(0.017)	(0.017)
High school and higher	−0.008	−0.008
	(0.016)	(0.017)
Woman was Employed	−0.025*	−0.026*
	(0.014)	(0.014)
Spouse was Employed	−0.091***	−0.090***
	(0.026)	(0.026)
Wealth quintile		
Second	−0.053**	−0.051**
	(0.024)	(0.023)
Middle	−0.058**	−0.052*
	(0.029)	(0.028)
Fourth	−0.059*	−0.051
	(0.031)	(0.031)
Highest	−0.089***	−0.080**
	(0.031)	(0.031)

(*Continued*)

Table 2. (*Continued*)

	Model 1	Model 2
Region (NUTS-1)		
West Marmara	0.014	0.011
	(0.027)	(0.027)
Aegean	−0.034	−0.038
	(0.025)	(0.026)
East Marmara	−0.055*	−0.058**
	(0.029)	(0.029)
West Anatolia	−0.031	−0.037
	(0.030)	(0.030)
Mediterranean	−0.010	−0.014
	(0.026)	(0.026)
Central Anatolia	−0.078***	−0.083***
	(0.022)	(0.022)
West Black Sea	−0.065**	−0.068***
	(0.025)	(0.026)
East Black Sea	−0.027	−0.030
	(0.029)	(0.030)
Northeast Anatolia	0.004	0.001
	(0.028)	(0.028)
Central East Anatolia	−0.040	−0.044
	(0.026)	(0.027)
Southeast Anatolia	−0.039	−0.044*
	(0.024)	(0.025)
Place of residence		
Urban	0.034**	0.036**
	(0.015)	(0.014)
Decision maker for woman's health care decision		
Woman and Spouse		0.016
		(0.013)
Spouse alone and others		0.016
		(0.028)
Heard information on reproductive health or FP from media sources[a]		0.012
		(0.018)
Heard information on reproductive health or FP from other sources[b]		−0.004
		(0.016)
Talked to spouse about reproductive health or FP		−0.022
		(0.026)

(*Continued*)

Table 2. (Continued)

	Model 1	Model 2
Use of internet		−0.017
		(0.017)
Watch women's programs on tv		−0.013
		(0.013)

Note: Weighted sample size is 3743. Complex sample design was taken into account and sampling weight was used. Standard errors are given in the parentheses. Omitted categories are '18–24' for age group, '0' for the number of children, 'no education' for the education level of woman, 'primary education' for the education level of the spouse, 'lowest' for the wealth variable, 'Istanbul' for region variable, 'woman alone' for the decision maker for woman's health care decision variable.
[a]Media sources include radio, tv, newspaper, and text messages on mobile phones.
[b]Other sources include internet, flyer, billboards, family doctors, and others. Significance levels are
*$p < 0.10$,
**$p < 0.05$ and
***$p < 0.01$.

University Institute of Population Studies, 2019). As the number of living children increases women's desire to have further children may decrease, and they become more attentive to controlling childbirth. Therefore, high-parity women may tend to use FP services more and have less unmet need for FP. Hence, priority in FP programmes should be given to women with no children in Turkey. A similar result for parity was also observed in Pakistan (Asif & Pervaiz, 2019). However, evidence from other low- and middle-income countries showed that strong traditions, big family size contributing to family income in rural areas and the high importance of having a male child force women to have more children and so they may have unmet need for FP (Wulifan et al., 2016; Solanke et al., 2019; Ahinkorah et al., 2020; Mulenga et al., 2020; Agyekum et al., 2022; Namukoko et al., 2022).

Similar to the findings in the literature (Oginni et al., 2015; Wulifan et al., 2016; Nzokirishaka & Itua, 2018; Solanke et al., 2019), as women's level of education increases the probability of having unmet need decreases. The largest impact was observed for women with high school and higher education level in Turkey. Since more educated women can better understand the benefits and risks of contraception, the use of contraception by women increases with woman's level of education (Wulifan et al., 2016; Sökmen et al., 2022). In Turkey, the use of contraceptives was the lowest among women who never attended school or did not complete primary school (60.9%) and increases as women's education level improves (Hacettepe University Institute of Population Studies, 2019). As a result, uneducated women are more prone to the risk of having unwanted pregnancies. Hence, the FP programmes should be tailored to improve the knowledge and use of contraceptive methods especially for less educated women.

Unmet need for FP was also found to be affected by woman's and spouse's employment statuses. Employed women were less likely to have unmet need than those who were not working. This result confirms the findings of some previous studies (Oginni et al., 2015; Asif & Pervaiz, 2019; Wulifan et al., 2019; Asif et al., 2021). The level of education, employment, and wealth status have been indicated among key factors for women's empowerment, which is positively associated with the use of contraceptives (Pratley, 2016; Yaya et al., 2018). Using data from TDHS-2013, Pekkurnaz (2020) showed employed women were more likely to use a contraceptive method than those who were not working. The Logit model estimations in this study also revealed that women with working spouses were less likely to have unmet needs than women with spouses who were not working. Similar to other studies (Nzokirishaka & Itua, 2018; Asif and Pervaiz, 2019; Ahinkorah et al., 2020; Yalew et al., 2020; Asif et al., 2021; Agyekum et al., 2022; Namukoko et al., 2022), this study also identified women from higher wealth categories were less likely to have

unmet need. This finding also corroborates the statistics given in 2018 TDHS report; the use of contraceptives was lower among women in the lowest wealth quintile (63.1%) than those of the highest (74.2%), and unmet need of the lowest group was almost ten percentage points higher than that of the highest (17.5% and 8.1%, respectively) (Hacettepe University Institute of Population Studies, 2019). It can be inferred that unemployed and poor families had disadvantages in using FP services and were exposed to a higher risk of having unmet need. Cali *et al.* (2004) showed that providing the opportunity to receive counselling to both women and men at first-level health centres would increase contraceptive use and thereby reduce unmet need for FP. Hence, the FP services should be freely provided by the public sector in primary care.

Results indicated that women living in urban areas were more likely to have unmet need in Turkey. Although this result departs from the general trend observed in low- and middle-income countries (Oginni *et al.*, 2015; Nzokirishaka & Itua, 2018; Asif & Pervaiz, 2019; Alie *et al.*, 2022), Wai *et al.* (2019) and Solanke *et al.* (2019) reported higher unmet needs in urban than in rural for Myanmar and Northern Nigeria, respectively. The higher likelihood of unmet need in urban areas can be explained by the fact that a slightly higher contraceptive use due to high usage of traditional methods was observed in rural areas than in urban in Turkey (Hacettepe University Institute of Population Studies, 2019). This could also partly be attributed to accelerated migration from rural to urban areas since the early 1980s, which carried over rural deprivation to urban periphery (Coban, 2013). The immigrants have limited knowledge about the availability of contraceptives and therefore higher unmet need for FP services in earlier years of their lives in urban areas (Lindstrom & Hernández, 2006; Santaş & Eryurt, 2020). Dinç *et al.* (2007) identified the percentage of unmet needs of women living in the socio-economically peripheral area was almost twice higher than that of women living in wealthier neighbourhoods of Manisa, a city located in western Turkey (17.7% and 8.3% respectively), despite their desired fertility was lower. Hence, interdisciplinary and qualitative research is needed to assess the association between women's knowledge and the use of contraceptives in peripheral neighbourhoods.

There were also regional differences in unmet need for FP; women living in East Marmara, Central Anatolia, and West Black Sea were less likely to have unmet needs than those living in Istanbul in both models. A higher modern contraceptive use in Central Anatolia than in Istanbul as well as a higher usage of the traditional method in Central Anatolia, East Marmara, and West Black Sea regions lead to a higher percentage of any contraceptive use in these regions than in Istanbul region (Hacettepe University Institute of Population Studies, 2019). These differences in contraceptive use compared to Istanbul may explain the differences in unmet needs for FP. Variations in contraceptive use may be due to the differences in healthcare resources and personnel across residential areas. A qualitative study conducted in a low-income settlement in Istanbul explored that women generally preferred female physicians to get information about FP (Karadon *et al.*, 2021). Hence, contraceptive use may be lower in areas where there are not enough female consultants. A more comprehensive qualitative study about sexual and reproductive health conducted recently in Turkey reported that family physicians could not meet the demand for FP services especially in low-income and high-fertility neighbourhoods due to inadequate health workers and contraceptive supplies (Yılmaz, 2020). This could be partially attributed to the structural changes in primary care that lessened the importance of sexual and reproductive health and impeded rights to access reproductive health services in the past decade (Öcek *et al.*, 2014; Him & Hoşgör, 2015; Cevik & Kilic, 2018; Yılmaz, 2020; Yücel *et al.*, 2020; Pekkurnaz *et al.*, 2021). However, the effect of these policy changes on contraceptive use and unmet need for FP should be further analysed. The differences in unmet need for FP in urban/rural settings and regions may also be due to socio-economic disparities arising from poverty, ethnicity, faith, and cultural norms (Yaya *et al.*, 2021; Agyekum *et al.*, 2022). Therefore, regional differences in unmet need for FP require in-depth investigation.

Some studies pointed out that women's choices of contraceptive methods are constrained by many factors such as women's families, their communities, ideologies of gender, and fear of side

effects rather than the lack of access to contraceptives and/or cost (Staveteig, 2017; Chatterjee & Riley, 2018). In this regard, almost 12% of women having unmet need stated that health concerns and fear of side effects were the main causes of not using any method in the study sample. On the other hand, husband's opposition, religious prohibition, and lack of access and cost were stated among other reasons for not using any method, by smaller percentages of women (4%, 1% and 1%, respectively). As for the reasons for method discontinuation, health concerns and fear of side effects were stated again as the main cause of almost 21% of women having unmet needs while husband disapproval, cost, and religious factors accounted for about 4%. The most commonly quitted methods stated by this group of women were the modern methods including pills, intrauterine devices, and injections. The common misperception about the side effects of modern methods was also found among women living in a low-income settlement in Istanbul (Karadon et al., 2021). These observations suggest that there is room for improving knowledge and eliminating concerns about the health effects of contraceptives through widespread counselling and education.

While unmet need is a powerful concept and the revised definition has enabled to make comparisons easier across countries and within a country over time (Cleland et al., 2014, Sedgh et al., 2016), there are some criticisms regarding its measurement. First of all, calculating unmet needs does not take into account the desire to use or access contraceptives (Bradley and Casterline, 2014; Staveteig, 2017). In addition, unmet need estimates were found to be sensitive to the underreporting of traditional methods and unstable fertility preferences (Staveteig, 2017), the retrospective reporting of fertility preferences, the timing of future fertility preferences, the duration of postpartum amenorrhoea and the identification of infecundity and being sexually active (Bradley & Casterline, 2014). Although the sensitivity analyses in Bradley and Casterline (2014) showed negligible differences in unmet need for FP in Turkey, a follow-up investigation and qualitative studies can be conducted to go beyond the shortcomings of using survey data (Staveteig, 2017; Chatterjee & Riley, 2018). These further studies should be designed to explore woman's desire to practice contraception and barriers to use that might be influenced by larger social forces. In addition, DHS focuses on woman's behaviour by assuming that it is the responsibility of a woman to make better choices about FP (Chatterjee & Riley, 2018). However, FP services and training on FP should be designed to engage also men in the decision-making process as men's involvement is an important factor to achieve reproductive goals (Asif et al., 2021; Karadon et al., 2021; Kwawukume et al., 2022).

Conclusion

Reducing the unmet need has critical importance that would improve maternal health as well as women's well-being. The unmet need for FP among currently married women aged 15–49 doubled from 6% in 2013 to 12% in 2018 in Turkey (Hacettepe University Institute of Population Studies, 2019). This study has been the first attempt to analyse the determinants of unmet need for FP for married women of reproductive age in Turkey by using data from the 2018 TDHS. Findings indicated that there were significant disparities concerning women's age groups, parity, level of education, employment status of both woman and spouse, wealth, and place of settlement in unmet need for FP. Women who had at least one child, were at older ages, higher educated, working (both woman and spouse), and wealthier had lower unmet needs. Therefore, the counselling and training on FP should target disadvantaged groups, especially young, uneducated, and poor women.

Integrating publicly provided FP programmes and education in primary care may bridge the gaps observed in demographic differences. With a successful record in FP that resulted in increased use of contraceptives between 1988 and 2013 and lesser gravity of shortcomings compared to low- and middle-income countries, Turkey has a better capacity to implement FP

programmes with wider geographical and demographic coverage. When socio-economic disparities are concerned, however, more extensive involvement of the public sector is needed, coupled with employment opportunities and benefits.

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