

Beyond a Paycheck: The Influence of Workforce Participation on Women's Cancer Screening in Turkey

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Abstract The present study investigates the influence of workforce participation on women's cancer screening behaviors in Turkey. In cultures with predominantly Muslim populations like Turkey, emphasis is typically placed on a woman's traditional role as a child bearer. Although the impact of workforce participation on women's welfare has been studied in various contexts, the relationship between workforce participation and health protective behavior has received scant attention. Using quantitative data from a survey of women aged 40 and above from 33 urban cities in Turkey ($N=483$), we examine the influence of workforce participation on breast and cervical cancer screening behaviors. Homemakers were less likely than working/retired women to be up-to-date on screenings. Women with lower income and education screened less; however, workforce participation seemed to have a positive effect on screening among these women. Additionally, working/retired women and homemakers differed from each other in terms of their perceptions regarding their risk of developing cancer (perceived susceptibility). In addition, both perceived susceptibility and women's perceptions regarding their ability to get cancer screening (self-efficacy) were significant predictors of intention to engage in screening in future. In Turkey, homemakers are in a vulnerable position due to lower rates of cancer screening. Furthermore, targeting home-

makers for interventions may be easier than trying to identify other low screening groups of women such as those with lower education or income. Interventions raising perceptions of susceptibility to cancer, possibly by targeting neighborhoods during working hours, could be useful in increasing screening rates at risk women.

Keywords Employment · Cancer screening · Islam · Women · Health · Intention · Mammogram · Pap smear

Studies conducted in countries such as Saudi Arabia, Qatar, Egypt, Kuwait (Elamin and Omair 2010; Sidani 2005), Lebanon (e.g., Tlaiss and Kauser 2011), Iran (Rezai-Rashti 2011), and Turkey (Göksel 2013) indicate that women's workforce participation varies greatly across Islamic countries. In some countries, there are laws and social norms restricting women's participation in social life, including workforce participation (for a review see Sechzer 2004). Thus, in these countries, a woman's role is strictly confined to the home. Yet, in other predominantly Islamic countries such as Turkey, women's workforce participation is officially encouraged by the state (Grand National Assembly of Turkey 2013). Nonetheless, a woman's traditional role is still widely considered to be in the home and with emphasis placed on bearing children. According to the World Values Survey (World Values Survey Association 2014), for instance, 77 % of respondents in Turkey indicated that a woman had to have children to be fulfilled. Furthermore, 66 % of the participants also believed that when women were employed, children suffered.

Although workforce participation may cause overload in women trying to juggle both family demands and job responsibilities, it may also provide benefits to women beyond the economic value of a paycheck. Namely,

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studies conducted in the United States (Gerstorff et al. 2011), the United Kingdom (Chandola et al. 2006), Bangladesh, India, Sri Lanka, and Nepal (Senarath and Gunawardena 2009), and Oman (Al Riyami et al. 2004) indicate that participation in the workforce may contribute to women's health by enhancing their autonomy in health decisions and their efficacy to engage in health protective behavior. In addition, given findings from data collected in the United States suggesting that interpersonal contacts are an important source of information about health risks (Ackerson and Viswanath 2009; Dutta and King 2008), it is possible that expansion of women's social circles through workforce participation will influence their assessment of health risks and consequently their behavior. According to a recent study conducted in the United States, empowering and protective effects of workforce participation may persist for women even after retirement (Silver 2010). Consequently, workforce participation may enable health protective behaviors in a few ways. In the current study, we investigate the influence of women's workforce participation on breast and cervical cancer screening behaviors in Turkey.

The Turkish Ministry of Health (2013) recommends that women 40 and over obtain yearly clinical breast exams, mammograms every 2 years, and PAP smears every 3 years. However, according to a report published by the Turkish Statistical Institute (2012), fewer than 40 % of women aged 45 to 65 have ever had a mammogram and around 30 % of women aged 25 to 65 have ever had a PAP smear. Hence, a better understanding of psychosocial and demographic factors associated with screening is needed in this context.

In the present study, we investigate whether women with workforce participation will have higher cancer screening rates than homemakers in Turkey. Specifically, we look at a composite measure of these screening behaviors (i.e., mammogram, clinical breast exams, PAP smear) for women who are 40 years old and older. This composite score allows us to test whether workforce participation influences the number of tests that women are "current on" (i.e., whether they have engaged in each of the screening behaviors at recommended time intervals). While examining screening differences as a function of workforce participation, to rule out the possible alternative explanations (discussed in the following) for the relationship between workforce participation and screening compliance, we will report multiple regression analyses that control for key socio-demographic indicators—religiosity, income, education, and marital status—that the Behavioral Model of Health Services Utilization uses (Andersen 1995). Finally, we study the differences between working/retired women and homemakers in terms of cancer susceptibility, screening efficacy, and future cancer screening intentions.

Behavioral Model of Health Services Utilization

Recent task force recommendations published in the United States (Moyer 2012) report that the use of cervical cancer screening can help detect cancer at an earlier phase, thereby reducing mortality rates. Likewise, according to a recent study investigating the effectiveness of the Norwegian Breast Cancer Screening Program (Hofvind et al. 2013), attendance in the screening programs significantly reduces mortality rates. Therefore, increasing the uptake and maintenance of cancer screening has been a major component of cancer prevention programs across the world (World Health Organization 2007).

Given these considerations, identification of factors that may facilitate or impede cancer screening plays a crucial role in the design of health interventions to increase adherence to recommended screening intervals. One of the most commonly used conceptual models that focuses on such factors is the Behavioral Model of Health Services Utilization (BM) (Andersen 1995). BM utilizes a systems perspective to combine individual, environmental, and healthcare provider-related factors associated with use of healthcare services. More specifically, it posits that whether individuals use a given health service depends on individuals' predisposition to use such services, factors that may enable or impede use, and their need for the service (for a summary of the model, see Phillips et al. 1998; for a systematic review of studies utilizing the model see Babitsch et al. 2012).

Individual predisposing factors include social-structural factors such as education, occupation, and household income. Enabling factors are those that increase accessibility of health services (Andersen 1995; Babitsch et al. 2012; Phillips et al. 1998). As we will discuss in the next section, household income may be an important predictor of cancer screening because of its relation to access to healthcare (see, for example, a study by Coughlin et al. 2008, which utilized data from the Behavioral Risk Factor Surveillance System in the United States). Similarly, research that will be summarized in the next section shows that education can increase uptake of cancer screening both by enhancing financial resources available and by increasing awareness of risk (Chandola et al. 2006; Donnelly et al. 2015). In addition to household income and education, another important determinant of uptake of health services can be workforce participation. Yet, reviews conducted on the BM model indicate that workforce participation has received scant attention. In particular, studies examining the role of workforce participation while controlling for household income and education are sorely needed (for a review, see Braveman et al. 2005).

Besides the social structural predisposing factors already discussed, the BM model also suggests that uptake of health services may depend on individuals' health beliefs, which can be defined as attitudes, values, and knowledge that may increase or decrease chances of seeking the service. This prediction of the BM model is supported by empirical data from

studies, conducted in the United States on women older than 35, that investigated health beliefs as predisposing factors for health service use (Champion and Miller 1996; Miller and Champion 1997). In particular, the relationship between social structural factors and uptake of health services may be mediated by health beliefs. Hence, rather than targeting structural variables such as income or workforce participation, which are difficult to change, health beliefs may constitute a viable route through which access can be enhanced (Andersen 1995).

Facilitators of Use of Healthcare Services

Rather than presenting a mathematical model with predetermined variables to be used in predicting health services use, the BM offers a framework for identification and analysis of potential factors associated with the decision to seek health services (Phillips et al. 1998). As such, there has been considerable variation across different health domains in terms of identification of factors that may enable use of health services. Yet, a recent review by Babitsch et al. (2012) showed that education and income, along with ethnicity, were the most frequently investigated predisposing factors that have been studied under the BM framework.

Indeed, studies that Babitsch et al. (2012) reviewed consistently reported that because higher income enhances individuals' economic autonomy and ability to pay for health services, it increases the likelihood that individuals will seek health services (e.g., regularly visit physicians, rely on physician diagnosis rather than self-diagnosis). Similarly, Babitsch et al. reported that more than half of the studies that investigated the relationship between education and health services utilization have found a positive relationship. There are several different mechanisms through which education may increase use of health services (Al Riyami et al. 2004; Chandola et al. 2006). First, the effect of education on health services utilization is mediated through enhanced financial resources and economic autonomy. Second, education enables utilization of health services indirectly through enhancing analytical skills necessary for processing information and assessing need. Third, education may contribute to health services via health beliefs—particularly by providing a sense of mastery over one's life.

In line with the BM, in cancer screening domain, studies conducted in the United States report that, among both Whites and ethnic minorities, less financial strain is associated with higher uptake of cancer screening (Coughlin et al. 2008; Miller and Champion 1997). Given that in Turkey, despite the introduction of a universal healthcare program, income and gender inequalities in access to healthcare persist and out-of-pocket expenses for health care continue to increase (Kilic 2014), a similar relationship between financial well-being and uptake of cancer screening can be expected. Likewise, various studies conducted both in higher income

nations, such as the United States (Bradley et al. 2002) and Qatar (Donnelly et al. 2015), as well as lower income nations such as Bangladesh, Comoros, Mali, and Mauritania (Akinyemiju 2012), indicate that women with lower education have lower screening rates and later stage cancer diagnoses.

Although education and income have received considerable attention as predisposing factors that enable use of health services in general and cancer screening in particular, much less attention has been paid to employment status (Babitsch et al. 2012). Employment status is typically used as a control variable interchangeable with, or as a proxy for, other indicators of socioeconomic status (for a review and criticism of this tendency in health research context, see Braveman et al. 2005). A more nuanced approach to understanding structural factors influencing health behavior would need to investigate in further detail, and with clearer explanatory mechanisms, the respective influence of such factors. In this light and as we will outline next, the role of workforce participation, particularly among women, as an enabling factor for healthcare services use may be independent from the respective enabling roles that education and income have. Namely, in line with the assumption of the BM that health beliefs provide a means through which social structural factors act as enabling resources, we will discuss how workforce participation may influence two pertinent health beliefs: efficacy and risk perceptions.

According to the role enhancement perspective (Sieber 1974; Stoller and Pugliesi 1989), traditional gender roles afford women with little opportunity to have control over achievement of desired results. In contrast, multiple roles that are brought by workforce participation may provide not only a sense of purpose but also a sense of efficacy and mastery over outcomes (Castro and Gordon 2011). Accordingly, such an enhanced sense of efficacy and mastery over one's life may also help increase intentions to engage in health protective behaviors (Annandale and Hunt 2000; Armitage and Conner 2001; Fishbein and Ajzen 2010; Floyd et al. 2000). In line with this possibility, studies conducted in different parts of the world such as the United States (Gerstorff et al. 2011), the United Kingdom (Chandola et al. 2006), South Asia (Senarath and Gunawardena 2009), and the Middle East (Al Riyami et al. 2004) report that empowerment brought about by workforce participation may help improve women's health and their ability to influence household decisions about their own health. Similar trends have been observed in Turkey: women participating in the formal economy are less dependent on their families and are less likely to be suppressed by them (Gunduz-Hosgor and Smits 2008). As such, it can be expected that workforce participation will have a similar empowering effect on Turkish women in terms of decisions over their health. To the extent that cancer screening involves a similar decision making process that hinges on being efficacious (Armitage and Conner 2001; Floyd et al. 2000), it can be expected that women with workforce participation experience will report

stronger intentions to engage in cancer screening in the future because of stronger perceptions of efficacy than homemakers.

As discussed in the preceding section, in the BM, an important predictor of the use of health services is the perceived need for that given service. As with other factors, the BM does not prescribe a set of variables that can be used to measure perceived need (Babitsch et al. 2012). Within the domain of cancer screening, in recent studies conducted in the United States (samples of White women and Latina women) perceived cancer risk is found to be among the key predictors of need for screening (Castañeda et al. 2014; Champion and Miller 1996; De Jesus and Xiao 2014). Research indicates that by enhancing decision-making ability, workforce participation may also help women acquire skills necessary to accurately assess perceived cancer risk (Gerstorff et al. 2011). These findings are in line with studies from Turkey (Erbil and Bolukbas 2012) and Iran (Parsa and Kandiah 2005) which found a significant relationship between occupational status, cancer knowledge, perceived susceptibility, and screening behavior.

In addition, although not explicitly discussed in earlier BM research, interpersonal communication constitutes a primary way through which individuals acquire (and assess) health information (Ackerson and Viswanath 2009). As such, the chances that individuals will be exposed to relevant health information may depend on the size and heterogeneity of one's social network (Dutta and King 2008). Studies focusing on various ethnic groups in the United States indicate that in addition to increasing access to relevant information, wider social networks may increase the chances that an individual will know someone diagnosed with cancer, thereby increasing perceptions of risk (Hovick et al. 2014; Sadler et al. 2007). Hence, to the extent that working women accumulate wider and more heterogeneous social networks than homemakers (McDonald and Mair 2010, study conducted in the United States), it can be expected that increased cancer risk perceptions will mediate the relationship between workforce participation and intentions to get cancer screening. Within the context of Turkey, this possibility is supported by findings indicating that exposure to information about cancer increases the likelihood of getting cancer screening (Secginli and Nahcivan 2006).

Religiosity and Cancer Screening in Muslim Populations

In a review of major health behavior theories, Joseph et al. (2009) argue that the applicability of such models across different cultures depends on understanding the social context—defined as sociocultural factors that influence health behavior by shaping day-to-day experiences of individuals. Accordingly, one important domain of analysis entails religious and spiritual

orientations (Joseph et al. 2009; Pasick and Burke 2008). Thus, it is important to consider the impact that religiosity and Islam may have women's cancer screening in Turkey.

There are two different perspectives on the relationship between religious beliefs and health behaviors. One perspective indicates that religious beliefs may impede health behaviors, especially when the behavior in question conflicts with religious beliefs (Allum et al. 2014, study conducted in the United Kingdom; Tkatch et al. 2014, study conducted among Orthodox Jews in the United States). For instance, research indicates that, among Asian-Islamic women in the United States, certain tenants dealing with modesty and same-gender physicians may act as barriers against breast and cancer screenings (Rajaram and Rashidi 1999). Likewise, studies conducted among Muslim women in Israel (Cohen and Azaiza 2008) and the United States (Matin and LeBaron 2004; Salman 2012) indicate that modesty and embarrassment were associated with decreases in screening.

On the other hand, research suggests that religious beliefs may positively contribute to individuals' tendency to engage in health protective behavior by increasing control perceptions which are necessary to deal with uncertainty (for a review, see Koenig et al. 2001). In this respect, studies conducted on physicians and patients in the United States underline the possibility that religious beliefs may help individuals better cope with the stress of learning about potential susceptibility to a disease (Curlin et al. 2007), which, in turn, may facilitate cancer screening (Leyva et al. 2014).

Given these two differing perspectives, an important question pertains to the conditions under which religious beliefs may impede or facilitate health behavior. One potential answer to this question comes from the religiosity-as-social-value hypothesis, which posits that the psychological benefits of religious beliefs (such as self-enhancement, self-esteem) will be enjoyed by individuals who are in a culture that values religiosity (Sedikides 2010). A recent study testing this hypothesis in a cross-national comparative analysis of online data from 11 European countries (including Turkey) report that correlations between individual religiosity, psychological adjustment, and self-esteem were stronger in countries (such as Turkey) where religiosity was valued more (Gebauer et al. 2012). Although the consequences of this hypothesis for health protective behavior are yet to be investigated, these findings, along with findings from other cross-national studies comparing more than 100 nations (Joshanloo and Weijers 2015), suggest that particularly in countries where religion plays a central role in individuals' day-to-day lives, religion may act as a factor that offsets the differences in well-being that result from inequalities in socioeconomic factors and may potentially function as a predisposing factor that enables use of healthcare service.

The Present Study

For the current study, we use survey data from Turkey's urban population and include controls for differences in demographic variables like income, education, marital status, and levels of religiosity. Namely, we tested three main hypotheses for working/retired women's and homemaker's cancer screenings. For our first hypothesis, we predict that women with workforce participation experience (current or retired) will have higher rates of being current on breast and cervical cancer screenings (Hypothesis 1a).

While testing Hypothesis 1a, we added education, income and religiosity as control variables. Education and income were added as control variables because, as discussed previously, a key question with regard to the influence of workforce participation on cancer screening is whether it has a role as a predisposing factor independent from education and income (Braveman et al. 2005). Likewise, as the preceding sections have outlined, especially in cultures where religion plays a central role in the daily lives of individuals, religious beliefs may potentially buffer differences that arise from unequal access to other resources (Joshani and Weijers 2015). As such, we added religious beliefs as a control variable while testing the first hypothesis and thus specified that controlling for income, education, marital status, and religiosity, women with workforce participation (current or retired) will have higher rates of being current on breast and cervical cancer screenings (Hypothesis 1b).

Second, our discussions regarding the mechanisms through which workforce participation may facilitate cancer screening identified two potential factors. The first factor is enhanced self-efficacy. As discussed in the preceding section (see Armitage and Conner 2001; Fishbein and Ajzen 2010; Floyd et al. 2000), we reasoned that workforce participation could facilitate screening behaviors and intentions by enhancing women's perceptions of their ability to perform the relevant screening behaviors (self-efficacy). As discussed earlier, the second factor is enhanced risk perceptions. Because of greater exposure to pertinent cancer risk information, women with workforce participation experience may have higher cancer risk perceptions (Hovick et al. 2014; Sadler et al. 2007), which should in turn bring about stronger intentions to get screened in the future. Thus, our discussion highlighted the possibility that efficacy and risk perceptions will mediate the relationship between workforce participation and cancer screening. In line with these predictions, we hypothesized that, compared to homemakers, women with workforce participation experience will have (a) higher cancer risk perceptions (Hypothesis 2a) and (b) higher efficacy for cancer screenings (Hypothesis 2b). We also expected that perceived risk perceptions and efficacy would mediate the relationship between workforce participation and intentions to engage in cancer screening in the future (Hypothesis 3).

Method

Participants and Procedure

We analyzed data from 483 women, between 40 and 70 years-old, who completed breast and cervical cancer screening measures as part of a broader study we conducted on health protective behaviors in Turkey. The broader study ($N=3021$) used multistage cluster sampling in 33 urban cities and involved face-to-face interviews lasting about an hour. The original dataset included both women and men aged 20 to 70. Because the existing cancer guidelines (The Turkish Ministry of Health 2013) indicate that mammograms are necessary only for women 40 and older, women under the age of 40 and men were removed from the present dataset. Additionally, women with a previous cancer diagnosis or chronic gynecologic condition were excluded—resulting in the final sample of 483 women.

The mean age of the 483 women in the subset of data used for our study was 50.86 ($SD=8.30$). Of the respondents, the majority had a primary school education or less ($n=346$, 71.6 %), a combined household income of less than 2,001TL (less than \$1,000 USD; $n=403$, 83.5 %), and were married ($n=386$, 80.1 %). Religiosity of the sample was relatively high: On a scale ranging from 0 to 10 with 10 being very religious, 80 % ($n=386$) of the participants marked scores between 6 and 10 ($M=7.00$; $SD=1.86$). In terms of access to health care services, a vast majority of women reported having health insurance ($n=457$, 94.6 %; including the Social Security Institution's Universal Health Insurance) and sought medical care in the last 12 months ($n=430$, 89.3 %). Women generally considered themselves to be healthy ($M=6.51$, $SD=1.78$, range=0–10). Finally, 38 % ($n=182$) of the respondents reported that they had a close other who had been diagnosed with cancer, and 7.5 % ($n=36$) of the respondents had a close other diagnosed with breast or cervical cancer.

The main variable of interest in the current study—workforce participation—concerns whether or not the respondent categorized herself as a current/former workforce participant or a “homemaker.” The majority of women categorized themselves as homemakers ($n=363$, 75.2 %), whereas the remainder categorized themselves as current/former workforce participants: working full-time ($n=65$, 13.5 %), working part-time ($n=7$, 1.4 %), worker currently seeking employment ($n=2$, 0.4 %), or retired ($n=46$, 9.5 %). Unpaid family workers and women not reporting work status were excluded ($n=19$).

Prior to analysis, we checked descriptive statistics to verify that working/retired women and homemakers did not differ from each other in terms of other predisposing factors for use of health services that have been identified by previous studies utilizing the BM (see Table 1). These variables are age, marital status, and access to healthcare (i.e., whether the respondent has insurance, whether the respondent has received medical

Table 1 Descriptive statistics by workforce participation

Measure	Homemaker		Working/ Retired	
	(n = 363)	Count	(n = 120)	Count
Demographics				
Age	51.13 (8.59)	363	50.03 (7.31)	120
Married	84.3 % _b	306	67.5 % _a	81
Education				
1. Primary school or less	82.6 % _b	300	38.3 % _a	46
2. Some high school	17.4 % _b	63	61.7 % _a	74
Household income (monthly)				
1. 1000 TL (\$500 USD) or less	44.9 % _b	163	25.0 % _a	30
2. 1001–2000 TL (\$501–1000 USD)	43.3 %	157	45.0 %	54
3. 2001 TL (\$1001 USD) or more	11.8 % _b	43	30.0 % _a	36
Religiosity (0–10)	7.13 (1.88) _b	363	6.59 (1.75) _a	120
Access to care/General health				
Has insurance	93.7 %	340	97.5 %	117
Had medical care in past 12 months	89.5 %	325	88.3 %	106
Current general health status (0–10)	6.42 (1.83)	363	6.77 (1.61)	120
Personal experience with cancer				
Close other diagnosed with cancer	39.4 %	143	32.5 %	39
Breast or cervical cancer family history	8.3 %	30	5.0 %	6

Means with different subscripts within a row are significantly different, $p < .05$

services in the last 12 months), as well as predisposing factors related to need for cancer screening (i.e., respondents' evaluations of current health, and whether the respondent has a family member with cancer) (for a review, see Babitsch et al. 2012). There were no differences between homemakers and working/retired women regarding age, being insured, medical services sought, breast/cervical cancer family history or knowing someone with a cancer diagnosis. However, compared to homemakers, working/retired women were more likely to have a higher level of education, to be single, to have a higher household income, and to be less religious.

Measures

Cancer Screening Behaviors

To create a composite measure of women's cancer screening behavior, we focused on three screening behaviors: having a clinical breast examination, having a mammogram, and having a PAP smear examination. Respondents reported whether they engaged in these screening behaviors within the recommended time intervals: within the past year for clinical breast examination, within the past 2 years for mammograms, and within the past 3 years for PAP smear. For each screening behavior, respondents were coded as either compliant (1) or non-compliant (0) with the recommended guidelines. The composite score was calculated by summing respondents' compliance score for each screening behavior, with possible composite scores ranging from 0 to 3.

To confirm that the difference between working/retired women and homemakers with respect to screening rates was not driven by a single screening test, we compared compliance for each screening behavior separately. Indeed, for each of the screening behaviors, working/retired women had higher rates of compliance. Specifically, among homemakers, 78 (21.5 %) were compliant in their clinical breast exam, 79 (21.7 %) in mammogram, and 104 (28.7 %) in PAP; whereas, among workforce participants, 40 (33.3 %) were compliant in their clinical breast exam, 40 (33.6 %) in mammogram, and 47 (39.5 %) in PAP (all differences significant at $p < .05$).

Health Beliefs and Cancer Screening Intentions

To measure cancer susceptibility and screening efficacy, we utilized items that were previously used by Secginli and Nahcivan (2004), based on behavioral models such as Health

Table 2 Health beliefs and cancer screening intentions

	Items	α	M	SD
Susceptibility	4	.84	2.82	.81
Efficacy	6	.84	3.73	.72
Intentions	3	.78	2.99	.89

Please see the [Appendix](#) for detailed information regarding the wording of the health belief items and the computation of the composite scores for susceptibility, efficacy and intentions

Table 3 Multivariate analysis of variance of workforce participation on cancer screening behavior, health beliefs and intentions to screen

Variables	Homemaker <i>M</i> (<i>SD</i>)	Working/ Retired <i>M</i> (<i>SD</i>)	Univariate <i>F</i>	Partial η^2
Cancer screening behavior	.71 (.94)	1.06 (1.15)	10.819***	.022
Cancer susceptibility	2.77 (.81)	2.98 (.78)	6.245*	.013
Efficacy	3.69 (.74)	3.82 (.66)	2.854 [†]	.006
Intentions to screen	2.95 (.91)	3.13 (.82)	3.752 [†]	.008

Wilk's $\Lambda = .966$, $F(4, 478) = 4.18$, $p < .01$, $\eta^2 = .034$

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Belief Model (Champion 1984) and Theory of Reasoned Action (Fishbein and Ajzen 2010). Using these items, we constructed composite measures of (a) breast and cervical cancer susceptibility and (b) PAP smear, clinical breast examination, and mammogram efficacy. The composite scores were constructed by taking an average of the respective items.

All questions used 5-point scales where increasing values corresponded with higher levels of each construct. Respondents also reported their intentions to get the following cancer screenings on a 5-point scale from 1 (*not at all likely*) to 5 (*very likely*): clinical breast exam in the next year, mammogram in the next 2 years, and PAP in the next 3 years. These three items were averaged to obtain a composite cancer screening intention score. All of the health belief items were evaluated for reliability and validity through a series of four pilot tests. (See Table 2 for scale reliability and descriptive summaries and see the Appendix for the items.)

Results

Cancer Screening Behaviors and Workforce Participation

Table 3 summarizes the results of a one-way MANOVA comparing homemakers and working/retired women in terms of their cancer screening behaviors (i.e., compliance with guidelines), cancer susceptibility, efficacy to screen for cancer, and intentions to screen for cancer (Wilk's $\Lambda = .966$), $F(4, 478) = 4.18$, $p < .01$; $\eta^2 = 0.034$. Table 4 compares

homemakers and working/retired women in terms of correlations between variables on which the hypotheses focus as well as control variables. Income and education were positively correlated with number of screening tests performed among homemakers but not among working/retired women. Also, religiosity was negatively correlated with cancer susceptibility and intentions to screen in future only among homemakers.

Screening rates were low. Consistent with Hypothesis 1a, homemakers were less compliant in their screening behaviors than working/retired women (see Table 3). Specifically, working/retired women had a higher number of current screening tests completed than homemakers $F(1, 481) = 10.82$; $p < .001$; $\eta^2 = 0.022$. To test whether this relationship between workforce participation and cancer screening persisted after controlling for key socio-demographic variables (Hypothesis 1b), we conducted multiple regression analyses.

In the initial regression model, we included workforce participation, household income (centered), education (centered), marital status (married or not), and religiosity (low or high) as well as the two-way interactions between workforce participation and household income, education, marital status, and religiosity. In this model, the two-way interactions between workforce participation and religiosity and workforce participation and marital status were not significantly related to number of current screening tests completed. However, when we included both of the two-way interactions between workforce participation and household income and between workforce participation and education, VIF for the interaction between workforce interaction and education exceeded 2.5, a threshold

Table 4 Correlations comparing homemakers and working/retired women

Variables	1	2	3	4	5	6	7
1. No of tests performed	–	.08	.04	–.11	.09	.20*	.33***
2. Income	.24***	–	.48***	–.02	.12	.09	.17 [†]
3. Education	.18**	.34***	–	–.17 [†]	.00	.06	.04
4. Religiosity	–.06	.04	–.15**	–	.05	–.07	.09
5. Cancer susceptibility	.04	–.05	.05	–.24***	–	.20*	.35***
6. Screening efficacy	.13*	.04	.05	–.06	.19***	–	.21*
7. Screening intentions	.29***	.08	.17**	–.13*	.42***	.41***	–

Correlations for Homemakers ($n = 363$) are reported below the diagonal; for Working/Retired Women ($n = 120$), above the diagonal

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Table 5 Linear regression for number of screening tests performed (Current) by workforce participation, education, income, and religiosity

Variables	Regression with Interaction between Education and Workforce Participation ($df=6, 428$)				Regression with Interaction between Income and Workforce Participation ($df=6, 428$)			
	B	SE B	B	VIF	B	SE B	β	VIF
Constant	.87***	.15			.91***	.15		
Workforce Part.	.23 [†]	.13	.10	1.43	.19	.13	.08	1.35
Education	.11*	.05	.18	2.44	.06	.04	.09	1.57
Income	.12**	.04	.15	1.29	.18***	.05	.22	1.76
Religiosity	-.04	.03	-.08	1.07	-.05	.03	-.08	1.08
Marital Status	-.06	.12	-.02	1.07	-.11*	.12	-.04	1.08
Education*Workforce	-.15*	.07	-.16	2.33	Not included in model due to multicollinearity			
Income*Workforce	Not included in model due to multicollinearity $R^2 = .08$ ***				-.019*	.08	-.14	1.67
					$R^2 = .08$ ***			

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

recommended by Allison (1999). Hence, subsequently, to reduce multicollinearity we ran two separate regression models (see Table 5): the first model contained the two-way interaction between workforce participation and household income, and the second model contained the two-way interaction between workforce participation and education. (VIF scores are reported on Table 5.) In both models, these interaction terms involving workforce participation significantly predicted number of current screening tests completed.

As can be seen in Fig. 1, workforce participation among less educated women was associated with a higher number of current screening tests completed. There was no observed difference among women with higher education levels. A similar pattern was observed for household income (see Fig. 2): whereas workforce participation among lower income women had a positive impact on number of current screening tests

completed, workforce participation among higher income women did not make a difference in screening. Given that low income and low education groups are especially vulnerable when it comes to screening compliance, these findings are very important in terms of designing interventions to increase screening behavior.

Workforce Participation and Health Beliefs

Next, we focus on the predictions that working/retired women have higher cancer susceptibility perceptions (Hypothesis 2a) and screening efficacy (Hypothesis 2b) than homemakers. As Table 3 shows and in line with the prediction of the Hypothesis 2a, working/retired women had higher perceived susceptibility perceptions. Although the direction of the difference between working/retired women and homemakers in terms

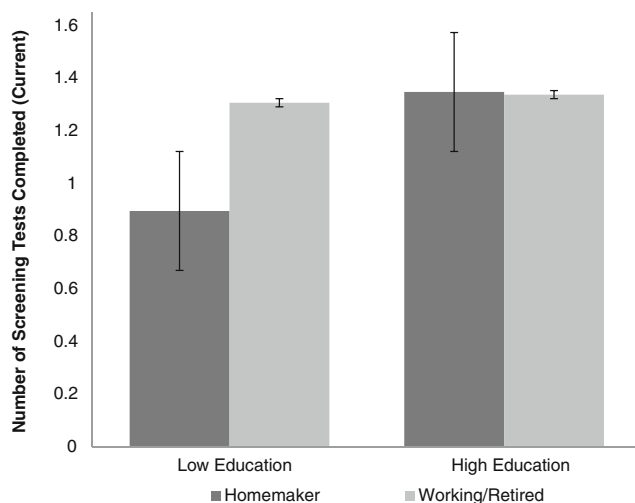


Fig. 1 Number of current cancer screening tests completed by workforce participation and education ($N=483$). Error bars with standard error

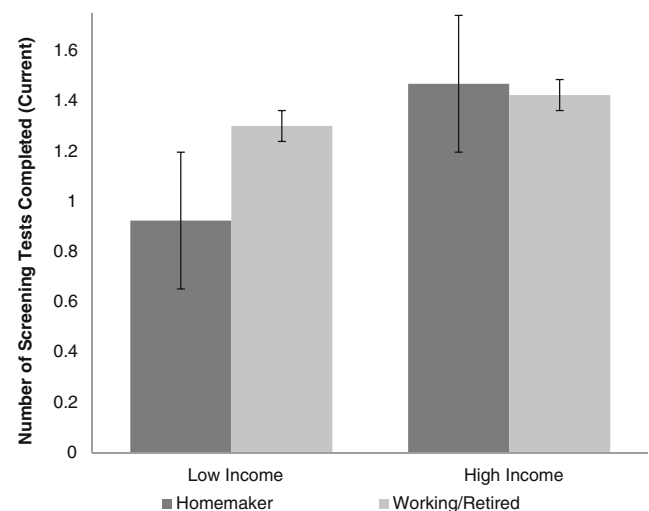


Fig. 2 Number of current cancer screening tests completed by workforce participation and income ($N=483$). Error bars with standard error

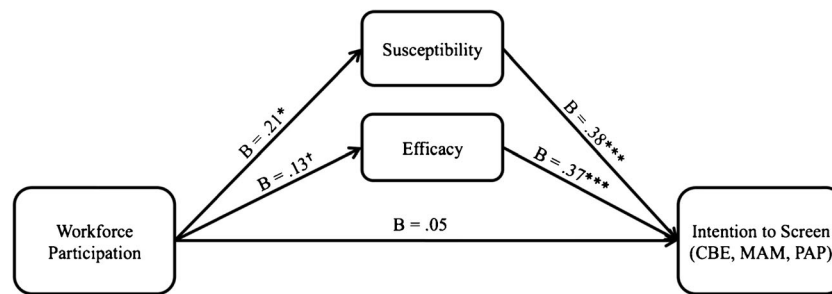


Fig. 3 Mediation model explaining the relationship among Workforce Participation, Perceived Susceptibility to Cancer, Screening Efficacy, and Intention to Engage in Cancer Screening ($N=483$). The coefficients

shown in figure are unstandardized regression coefficients. $R^2 = .25$, $p < .001$. $^\dagger p < .10$. * $p < .05$. *** $p < .001$

of efficacy was as predicted by Hypothesis 2b, this difference was marginally significant and very small ($p < .092$, $\eta^2 = .006$).

Finally, we tested Hypothesis 3 which predicted that perceived cancer susceptibility and efficacy would mediate the relationship between workforce participation and cancer screening intentions. Using the PROCESS macro in SPSS (Model 4, with a bootstrap approach of 5000 drawings; Hayes 2013), we conducted a test for whether perceived cancer susceptibility and screening efficacy mediated the relationship between workforce participation and screening intentions. Consistent with Hypothesis 3, the relationship between workforce participation and screening intentions was fully mediated by susceptibility and efficacy (see Fig. 3). First, workforce participation significantly increased perceptions of susceptibility, which in turn increased cancer-screening intentions. Second, workforce participation marginally increased efficacy perceptions, which, in turn, positively contributed to cancer screening intentions.

Discussion

The aim of the present article was to investigate workforce participation as an enabling predisposition in women's breast and cervical cancer screening behaviors in Turkey. Specifically, we investigated whether working/retired women differed from homemakers in terms of being current on a combined measure of clinical breast exam, mammogram, and PAP smear. Consistent with other studies conducted in Turkey (Gulten et al. 2012), screenings for both breast and cervical cancer were low. Of three possible screening tests, women were current in less than one test on average. Second, as predicted in Hypothesis 1a, we observed significant differences between homemakers and working/retired women in terms of the extent to which they were current on their screenings.

Being current in one's screenings has more direct implications for protection of one's health than having ever engaged in screening. For example, a woman who may have had one PAP smear 10 years ago is not necessarily safer than a woman

who never had a PAP smear. Considering Turkey's low regular screening rates, the potential contribution that workforce participation makes to being current on cancer screening is a substantial gain for early detection.

Using workforce participation as a predictor of cancer screening may help in identifying vulnerable groups of women in Turkey. Research has shown that women with low income and low education screen less and are at higher risk for later stage cancer diagnosis (Akinyemiju 2012; Donnelly et al. 2015). Specifically, our results regarding Hypothesis 1b indicate that workforce participation significantly interacts with these two (education and income) indicators of socioeconomic status. Our results show the positive effect of workforce participation in low income and low educated women. Namely, among women whose income and education are lower, workforce experience is associated with an increase in the likelihood that women will engage in screening. This is indicative of the potential of workforce participation to compensate for disparities that are associated with lower socioeconomic status. Relatedly, using the distinction of homemaker for women helps to identify the most vulnerable group of women—homemakers with low income and low education.

Additionally, our analyses point to factors that may potentially mediate the effect of workforce participation on cancer screening. First, as predicted by Hypothesis 2a, workforce participants had higher perceived susceptibility. This may be because wider social networks, that is, networks of women who have been or currently are in the workforce, may increase opportunities to gain knowledge about cancer risk. Hence, boosting susceptibility in homemakers, as compared to women with workforce participation, may have a greater impact on all cancer screening intentions.

Second, as also suggested previously, workforce participation may increase self-esteem, which in turn may make it more likely that women feel empowered and thus may be more proactive in screening (Armitage and Conner 2001; Floyd et al. 2000). In line with this perspective, we observed that working/retired women had higher efficacy than homemakers, however, this difference was only marginally significant and yielded a very small effect size (Hypothesis 2b). More specifically, we have observed that susceptibility and efficacy perceptions

mediate the relationship between workforce participation and intentions to engage in cancer screening in the future (Hypothesis 3). These results suggest that boosting a sense of empowerment and control among homemakers may be key to increasing uptake of cancer screening tests.

Applications, Limitations, and Future Directions

Our results described have several key applied implications. First, the finding that workforce participation is a significant predictor of uptake of cancer screening can be of crucial importance not only for identifying risk groups but also for reaching these women. Consider the use of mobile cancer screening vehicles for reaching neighborhoods and women to be screened (for a discussion of such an outreach program, see Ozmen et al. 2011). By targeting relatively less well-off residential neighborhoods during daytime (working hours), such an outreach program can be effective in terms of reaching women who are least likely to proactively seek an opportunity to get screened. Second, from a message design standpoint, the results imply that messages that emphasize susceptibility, without scaring individuals, may potentially be effective across different socioeconomic groups and are particularly necessary for homemakers. In addition, use of targeted communications to increase the behavioral efficacy of women with lower socioeconomic status may be considered as an effective strategy.

In addition to homemakers being easier to reach, women just entering into the workforce may be prime targets for intervention. In Turkey, more women are migrating to urban centers and entering into the workforce (Gunduz-Hosgor and Smits 2008). Among women newly entering into the workforce, researchers can evaluate changing perceptions and practices of cancer screenings and target these women to raise screening rates.

Although there are important implications for our findings, some limitations for our study must be considered. The first may be its generalizability to other Muslim populations. Low screening rates were noted across a variety of female Muslim populations in nations of both high and low income and in nations with both secular and Islam governance (Akinyemiju 2012; Baron-Epel et al. 2004; Donnelly et al. 2015; Guvenc et al. 2012; Matin and LeBaron 2004; Yilmaz et al. 2011). However, it must be noted that, despite the importance of Islamic tenets in daily lives of individuals, Turkey is a nation governed by secular rather than Islamic laws. Although we consider susceptibility and efficacy, both of which may be important factors across a variety of women, our results may not generalize to other Islamic nations and must be tested within those nations. If results do generalize, identification of low screening women who are homemakers may help raise screening rates in other Muslim women outside of Turkey.

A second limitation to generalizability may come in the form of screening recommendations. Although Turkey recommends

the three tests covered in our paper (Turkish Ministry of Health 2013), guidelines within other nations may vary with recommended tests and age at first screening (World Health Organization 2014). For example, mammogram screening is not universally recommended in nations with limited resources, and even in nations with greater resources, recommendations are based on shared decision-making analyzing both costs and benefits to individual women (World Health Organization 2014). Thus, a question remains as to whether results would generalize to nations with different screening guidelines. In addition our study may be limited because of our age restriction. We focused on women aged 40 and older specifically because of mammogram recommendations in Turkey. Further research is needed to assess the possibility that, in younger women, child bearing responsibilities may factor as a potential strain on women's resources to engage in protective behavior.

Although our analyses uncovered higher perceived susceptibility and marginally higher efficacy towards breast and cervical cancer screenings in women with workforce participation compared to homemakers, our data did not allow for tests involving more immediate potential mediators between workforce participation and the predisposing health beliefs. For example, in the current study women were asked about knowing close others with cancer, yet the social network of women in the workforce may entail a wider network—such as co-workers and clients—that would not necessarily be considered as a “close other” but nevertheless may act as exemplars that influence perceptions of cancer susceptibility. Hence, additional questions can help further determine if larger social networks gained through work lead to more cancer exposure and in turn greater susceptibility perceptions.

In conclusion, cancer screening, while lifesaving, is underutilized by both women in Turkey and many populations of Muslim women. Women in Turkey with current or past workforce experience were more likely to have used these lifesaving tests compared to homemakers. Homemakers, especially those of low income and low education, are the most vulnerable group of women. The distinction of homemaker not only helps identify a low screening group but also might help interventionists locate these women during daytime hours and focus on susceptibility and self-efficacy to aid intervention planning.

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Compliance with Ethical Standards Koç University's Internal Review Board approved this study, and for each participant, informed consent was collected, participation was voluntary, and anonymity was maintained.

Conflict of Interest The authors declare no conflict of interest, and this manuscript is not considered for publication at any other outlet.

Appendix

Table 6 Wording of items in the scales

	Item wording in Turkish	English translation of the item
Susceptibility		
Breast cancer	İleride meme kanseri olma ihtimaliniz sizce ne kadardır?	How likely do you think it is that you will develop breast cancer in the future?
	Sizin yaşınızdaki ortalama bir kadınla karşılaştırıldığında, meme kanseri olma riskiniz sizce ne kadardır?	Compared to the average woman your age, what is the risk that you will develop breast cancer?
Cervical cancer	İleride serviks yani rahim ağzı kanseri olma ihtimaliniz sizce ne kadardır?	How likely do you think it is that you will develop cervical cancer in the future?
	Sizin yaşınızdaki ortalama bir kadınla karşılaştırıldığında, serviks yani rahim ağzı kanseri olma riskiniz sizce ne kadardır?	Compared to the average woman your age, what is the risk that you will develop cervical cancer?
Efficacy		
Clinical breast examination	Eğer istersem, her yıl doktorda meme muayenesi yaptırabilirim	If I wanted to, I can obtain a clinical breast examination every year.
	Her yıl doktorda meme muayenesini kolayca yaptırabileceğimi düşünüyorum	I think I can easily obtain a clinical breast examination every year.
Mammogram	Eğer istersem, iki yılda bir mamografi yaptırabilirim	If I wanted to, I can obtain a mammogram every 2 years.
	Kolayca iki yılda bir mamografi yaptırabileceğimi düşünüyorum.	I think I can easily obtain a mammogram every 2 years.
Pap smear	Eğer istersem, üç yılda bir simir testi yani rahim ağzı kanser testi yaptırabilirim.	If I wanted to, I can obtain a Pap smear test every 3 years.
	Üç yılda bir kolayca simir testi yaptırabileceğimi düşünüyorum.	I think I can easily obtain a Pap smear test every 3 years.
Intentions		
Clinical breast examination	Önümüzdeki yıl içinde doktorda meme muayenesi yaptırma ihtimaliniz ne kadardır?	What is the likelihood that you will get a clinical breast examination within the next year?
Mammogram	Önümüzdeki iki yıl içinde mamografi yaptırma ihtimaliniz ne kadardır?	What is the likelihood that you will get a mammogram within the next 2 years?
Pap smear	Önümüzdeki üç yıl içinde simir testi yaptırma ihtimaliniz ne kadardır?	What is the likelihood that you will get a PAP smear test within the next 3 years?

All items are measured using 5-point rating scales where higher values corresponded to higher levels of the construct. For susceptibility, composite scores were calculated by averaging responses for breast and cervical cancer items related to each construct. For efficacy and intentions, composite scores were calculated by taking an average of clinical breast exam, mammogram, and PAP items for each construct

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