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# An Application of the Behavioral Model to the Utilization of Health Care Services in Turkey: A Focus on Equity

**Summary:** The aim of this study is to investigate the equity phenomenon, which can be defined as an equal treatment for equal need irrespective of socio-economic status, in the utilization of health care services in Turkey (for out-patient and in-patient treatment services, separately) in the context of the behavioral model. We have used the "Health Surveys" obtained from the Turkish Statistical Institute for 2010, 2012 and 2014. The equity phenomenon and the determinants of the health care utilization are investigated by using the probit model. The findings indicate that the need variable has the largest marginal effect in magnitude for all types of health care. This implies that the health system structure in Turkey is based on need and, therefore, equity exists in the utilization of health care services. We have also found that health insurance has the second largest marginal effect after the need variable. This means that policy makers should focus on enabling factors, especially the coverage of health insurance and the level of income to increase health care utilization of the disadvantaged segments of the population.

**Key words:** Equity, Health care utilization, Behavioral model.

**JEL:** I12, I14.

The use of health care services, defined as the basic right of individuals, plays an important role in assessing the performance of health systems and in restructuring the health care sector. On the other hand, equity in the use of health care is a topic that has been debated for many years and constitutes the main objective of almost all countries' health policies. Equity in the utilization of health care services is a phenomenon where all individuals can access health care services when and as much as they need, regardless of their ability to pay (Paula A. Braveman 2003). In other words, in the health systems that provide equity, individuals have the opportunity of utilizing equal treatments for equal needs, irrespective of socio-economic status (Adam Wagstaff and Eddy Van Doorslaer 2000).

In this context, the aim of this study is to investigate the equity phenomenon in the utilization of health care services in Turkey (for out-patient and in-patient treatment services, separately), in the context of the Behavioral Model developed by Ronald M. Andersen (1968), using the "Health Surveys" obtained from Turkish Statistical Institute for 2010, 2012 and 2014.

The rest of the study is structured as follows; Section 1 provides a brief and current review of the literature, Section 2 describes the materials and methods used in the study, Section 3 offers the results of the study followed by a detailed discussion in Section 4. In addition, the final section concludes the study.

## 1. Literature Review

In recent years, a significant part of empirical studies investigating the issue of equity in the utilization of health care services has been used the *Behavioral Model* developed by Andersen (1968) as the theoretical model (see, for example, Ken S. Field and David J. Briggs 2001; J. Lee Hargraves and Jack Hadley 2003; Katherine D. Hoerster et al. 2010; Whitney P. Witt et al. 2011). Andersen (1968) suggests that three groups of factors affect the utilization of health care services: predisposing factors, enabling factors, and health care need (Andersen 1968; Andersen and Lu Ann Aday 1978). Predisposing factors refer to the fact that some individuals use health care services more than others because of their individual characteristics do. This group of factors include, for example, age, gender, marital status, educational status, ethnicity, occupational status, and attitudes and behaviors related to health services (Andersen and John F. Newman 1973). However, some conditions must exist for individuals to use health care services after the decision has been made. In this context, enabling factors, such as income, the existence of health insurance, the price of health services, play an important role in the Behavioral Model of Andersen (1968). Finally, health care need is accepted as the main cause of the use of health care services and plays a dominant role in the model (Aday et al. 2004).

Birgit Babitsch, Daniela Gohl, and Thomas Von Lengerke (2012) reviews studies that use Andersen's Behavioral Model (ABM) to analyze health service utilization. They find that ABM is widely used to differentiate between the effects of predisposing, enabling, and need factors on health service utilization. Although they find a wide range of variable use to define these factors, most pronounced variable selections are in line with this study. This study shows that ABM is analyzed for a wide range of countries, such as the US, the UK, Canada, Germany, or Australia. Studies also differ in terms of the service type they analyze, such as GP services, emergency care, outpatient services, and inpatient services. Most pronounced results in the literature indicate that gender, ethnicity, education, marital status, residence, and employment are important factors that determine health service use. Need factors are generally used in three forms: self-assessed health status, evaluated health status, and having chronic illness. Furthermore, in recent years, ABM is expended to adapt and analyze issues other than health service use. For example, Sabina Hirshfield et al. (2016) use ABM for risk assessment in hypertension. Sara Strickhouser Vega, Melanie Sberna Hinojosa, and Jenny Nguyen (2017) adapts the ABM to predict participation to a nutrition assistance program. Dirk Heider et al. (2014) uses the same methodology in analyzing the relationship of health service costs rather than access or utilization. Existent literature shows the importance of ABM as well as the potential to expand and adapt. This study aims to expand this literature by focusing on equity.

The relative importance or dominance in rating the factors in utilization of health care services are closely related to the equity phenomenon. To be specific, when

the enabling or predisposing factors are dominant in the utilization instead of health care need, it can be argued that inequity exists in the utilization of health care services. In this regard, health care need should be the main determinant of the utilization for a health system to provide equity (Andersen 1968).

To investigate the issue, probit model, which is used in the existing literature, will be used (see, for example, K. Bruce Newbold, John Eyles, and Stephen Birch 1995 for Canada; Hugh R. Waters 2000 for Ecuador; Stephen Morris, Matthew Sutton, and Hugh Gravelle 2005 for England). However, in the existing literature, a study combining the probit model, equity, and Andersen (1968) model was not found. On the other hand, probit model has been used for equity research in health services in recent years (see, for example, Wei Yang 2013 for China; Alicia Núñez and Chunhuei Chi 2013 for Chile; Vu Duy Kien et al. 2014 for Vietnam; Eiko Saito et al. 2016 for Nepal; Ethel M. Brinda et al. 2016 for India; Paola A. Mosquera 2017 for Sweden). Furthermore, for analyzing inequity in the utilization of health care services, probit model has also been used for international and selected country studies (see, for example, Vincenzo Carrieri, Cinzia Di Novi, and Cristina Elisa Orso 2017 for Europe; Eddy Van Doorslaer, Xander Koolman, and Andrew M. Jones 2004 for Europe; Marion Devaux 2015 for selected 18 OECD countries). In addition, the investigation of the utilization of health care services in Turkey is especially important, considering the fact that the reform process that the Turkish health care system is undergoing since 2003. Inequities in utilization of health care services have been regarded as one of the most important problems of the Turkish health care system persistent for a long time (Organization for Economic Co-operation and Development - OECD 2008), and eliminating these inequities is one of the most important aims of the Health Transformation Program. However, inequity in the utilization of health care services, which is highly observed even in developed countries, has not yet been investigated (especially empirically) for Turkey. On the other hand, studies on the utilization of health care services in Turkey are quite scarce. Kaan Sözmen and Belgin Ünal (2016) analyzed the inequalities in health care utilization in Turkey using Health Survey for 2008. They analyze GP, specialist, emergency, and dental care to calculate an inequality index. Although valuable and important, their study is limited in terms of time span and methodology. In this respect, this study fills a vast gap in the existing literature.

## 2. Materials and Methods

In the empirical analysis, the "Health Survey" data sets for 2010, 2012 and 2014, which are the most recent data sets obtained from Turkish Statistical Institute, were used. These data sets are carried throughout Turkey and has national representation capability. Turkish Statistical Institution covers all settlements in Turkey in sample selection, while implementing the Health Surveys. A total of 7,886, 14,400, and 9,740 households in 2010, 2012 and 2014, respectively, who received health service within the previous 12 months, were surveyed. In the questionnaires, there are questions about 0 to 6 years and 7 to 14 years age groups. However, the parent and the child cannot be linked. This study includes individuals who received health care service within the last year and are aged 15 years and older who have responded to the relevant questions. The survey provides 20,200 observations in 2010, 37,979 in 2012, and 26,075 in 2014.

In this study, the utilization of health care services is used as a dependent variable to investigate the factors affecting health care service utilization. Three different dependent variables are used and tested against the below hypotheses, namely, GP services, outpatient services and inpatient services. The dependent variables are categorical and take the value of 1 if the individual utilized the specific health service within the last year and 0 if otherwise. The hypotheses investigated by this study are as follows:

*Hypothesis 1: Individual characteristics determine the probability of using health care services.*

Current literature indicates a significant relationship between individual characteristics and health service utilization. For example, women are expected to have a higher probability of using health services with respect to men (Paul D. Cleary, David Mechanic, and James R. Greenley 1982; Klea D. Bertakis et al. 2000). Insurance status, education, and income are among the most pronounced individual characteristics that have significant effects on the probability of health service utilization (Field and Briggs 2001; Menno Pradhan and Nicholas Prescott 2002; Adnan Kısa et al. 2009). While investigating this probability, Andersen's (1968) behavioral model is used to classify individual characteristics. As stated above, Andersen (1968) differentiates between enabling, predisposing, and need factors. It is possible to use this classification with the independent variables of this study and therefore assess the effects of these factors separately.

*Hypothesis 2: Enabling, predisposing and need factors will have different effects on different types of health care services.*

Combining the results from numerous studies show us that there are different socio-economic determinants for different types of health services. For example, Debra L. Blackwell et al. (2009) investigates the socio-economic differences in utilization of GP and inpatient services and find different set of determinants. Andersen et al. (2002) and Ruth Parslow et al. (2002) and indicate different patterns of use for different health services. This study also helps in identifying these different determinants for Turkish health care system.

A probit model has been estimated for three different service types: GP visits, outpatient visits, and inpatient visits to test the above hypotheses. The dependent variable is a dummy variable in each case, takes the value 1 if the individual has used the particular health service in the last 12 months and 0 otherwise.

The general form of the probit model is given in Equation (1):

$$y^* = \boldsymbol{x}'\beta + e. \tag{1}$$

According to the above equation, $y^*$ represents the unobserved dependent variable, $\beta$ represents the set of parameters, and $\boldsymbol{x}$ is the vector of independent variables. Error term is assumed to be normally distributed with zero mean and constant variance $e \sim N(0,1)$. $\beta$ shows the effect of the independent variables' changes on the possibility

of using health care. The working principle of the probit model is based on the maximum likelihood estimation (William H. Greene 2003).

Equation (2) gives the probabilities for observing $y = 0$ and $y = 1$. Cumulative standard normal distribution limits the probability of $\Phi(.)$ between 0 and 1.

$$\Pr(y = 1|\boldsymbol{x}) = \Phi(\boldsymbol{x}'\beta). \quad (2)$$

The maximum likelihood estimation method finds out which value of the $\beta$ parameters maximizes the probability of observing the data sample. In this method, which is based on probability estimation, the calculation and interpretation of marginal effects, as well as the calculation of the coefficients, are very important. Marginal affects show that how one unit of change in the variable affects the probability defined as $\Pr(y = 1|x)$, whereas all other variables are constant.

Table 1 gives information regarding the dependent and independent variables used in this study.

**Table 1** Variable Definitions

| | Variable name | Explanation | Classification |
|---|---|---|---|
| Use of GP services | GP | Visited the GP at least once in the last 12 months = 1<br>None = 0 | Dependent |
| Use of outpatient health care | Outpatient | Visited a specialist in the hospital at least once in the 12 months = 1<br>None = 0 | Dependent |
| Use of inpatient health care | Inpatient | Hospitalized at least once in the 12 months = 1<br>None = 0 | Dependent |
| Gender | Woman | Woman = 1 Man = 0 | Predisposing |
| Age, years | Age 15_24 (ref. category) | 15-24 Age group = 1<br>Other = 0 | Predisposing |
| | Age 25_34 | 25-34 Age group = 1<br>Other = 0 | |
| | Age 35_44 | 35-44 Age group = 1<br>Other = 0 | |
| | Age 45_54 | 45-54 Age group = 1<br>Other = 0 | |
| | Age 55_64 | 55-64 Age group = 1<br>Other = 0 | |
| | Age 65_74 | 65-74 Age group = 1<br>Other = 0 | |
| | Age 75+ | 75+ Age group = 1<br>Other = 0 | |
| Place of residence | Urban | Urban = 1<br>Rural = 0 | Enabling |
| Status of insurance | Insurance | Have = 1<br>Do not have = 0 | Enabling |
| Educational level | Illiterate (ref. category) | Illiterate = 1<br>Other = 0 | Predisposing |
| | Literate | Did not graduate but literate = 1<br>Other = 0 | |

| | | | |
|---|---|---|---|
| | Primary school | Primary school graduate = 1<br>Other = 0 | |
| | Secondary school | Secondary school graduate = 1<br>Other = 0 | |
| | High school | High school graduate = 1<br>Other = 0 | |
| | University | University graduate = 1<br>Other = 0 | |
| | Graduate | Have masters or PhD degree = 1<br>Other = 0 | |
| Marital status | Single (ref. category) | Single = 1<br>Other = 0 | Enabling |
| | Married | Married = 1<br>Other = 0 | |
| | Divorced-widowed | Widowed = 1<br>Other = 0 | |
| Employment status | Employed | Employed = 1<br>Not employed = 0 | Enabling |
| Income group | Very poor (ref. category) | Very poor = 1<br>Other = 0 | Enabling |
| | Poor | Poor = 1<br>Other = 0 | |
| | Middle income | Middle = 1<br>Other = 0 | |
| | Rich | Rich = 1<br>Other = 0 | |
| | Very rich | Very rich = 1<br>Other = 0 | |
| Health problem | Problem | Have a physical health problem lasting longer than 6 months = 1<br>None = 0 | Need |
| Chronic disease | Chronic | Has a diagnosed chronic illness = 1<br>Other = 0 | Need |

**Source:** Authors' compilation.

Since most of the variables used in the study are dummy variables as explained in Table 1, we preferred to give ratios as descriptive statistics. These statistics are presented in Table 2.

**Table 2** Descriptive Statistics N(%)

| | **Variable Name** | **2010** | **2012** | **2014** |
|---|---|---|---|---|
| Use of GP services | GP | 53.30 | 62.22 | 54.41 |
| Use of outpatient health care | Outpatient | 60.41 | 60.01 | 64.62 |
| Use of inpatient health care | Inpatient | 9.29 | 9.07 | 12.19 |
| Gender | Woman | 56.48 | 53.93 | 52.57 |
| Age, years | Age 15_24 | 18.46 | 18.25 | 17.71 |
| | Age 25_34 | 20.09 | 19.98 | 19.14 |
| | Age 35_44 | 19.51 | 19.80 | 19.70 |

| | | | | |
|---|---|---|---|---|
| | Age 45_54 | 17.34 | 17.54 | 17.42 |
| | Age 55_64 | 12.15 | 12.33 | 13.36 |
| | Age 65_74 | 7.72 | 7.54 | 7.83 |
| | Age 75+ | 4.73 | 4.56 | 4.85 |
| Place of residence | Urban | 71.13 | 73.63 | - |
| Status of insurance | Insurance | 85.54 | 89.78 | 92.90 |
| Education | Illiterate | 11.41 | 10.37 | 5.01 |
| | Literate | 7.64 | 5.96 | 9.88 |
| | Primary school | 37.47 | 35.31 | 37.19 |
| | Secondary school | 17.41 | 18.75 | 16.74 |
| | High school | 15.78 | 17.60 | 17.58 |
| | University | 9.60 | 11.16 | 12.33 |
| | Graduate | 0.69 | 0.85 | 1.27 |
| Marital status | Single | 21.89 | 22.82 | 21.71 |
| | Married | 69.43 | 68.51 | 68.80 |
| | Divorced-widowed | 8.68 | 8.67 | 9.49 |
| Employment status | Employed | 36.29 | 37.23 | 39.63 |
| Income | Very poor | 17.6 | 8.85 | 30.81 |
| | Poor | 21.57 | 12.33 | 20.17 |
| | Middle income | 20.73 | 24.51 | 16.28 |
| | Rich | 19.73 | 22.21 | 17.12 |
| | Very rich | 19.5 | 30.92 | 15.62 |
| | Non-respondent | 0.87 | 1.18 | 0 |
| Health problem | Problem | 37.52 | 36.11 | 51.03 |
| Chronic disease | Chronic | 52.98 | 45.85 | 62.40 |

**Source:** Authors' calculations.

Table 2 provides important information regarding individual characteristics represented in the Health Surveys used. We can argue that males and females are equally represented in the surveys 2010 yielding the highest ratio for female respondents to the surveys. The age distribution is stable over the years and concentrated over 15 to 54 years of age. We observe an increasing level in urbanization over the years. In 2010, the ratio of the respondents living in an urban are is 71.13%, whereas in 2012, the same ratio is 73.63%. Most pronounced ratios are of status of insurance. Coinciding with the government's policies especially after 2008, the ratio of insured individuals increases substantially, and in 2014, almost 93% of the respondents are covered with health insurance. Education status of the individuals are also stable over the years and concentrate around primary school graduation, even though 12-year schooling is mandatory in Turkey. Almost 70% of the respondents are married for all years considered. The ratio of employed individuals can be considered stable over time. When income status of the individuals is examined through Table 2, the ratio of very poor and poor individuals decreases sharply in 2012. However, it should be mentioned that this fact could mainly be attributed to the scaling provided with the data. Those with a higher monthly

household income than $843[1] and above are considered very rich. Individuals with a household income between US$575 and US$842 are considered rich. Those with monthly household income between US$574 and US$411 are considered to belong to the middle-income group. Individuals with a monthly household income between US$410 and US$287 are considered poor. Finally, those with a lower monthly household income than US$286 are considered very poor. The data gives information regarding the income groups of individuals rather than the actual amount of income, forcing us to use the scaling provided with the data. In the probit analysis, as a need variable, two different categorical variables, perceived and evaluated, were used and, thus, the robustness test was performed. The first dummy variable takes the value of 1 if the individual declares that s(he) has a physical health problem lasting longer than 6 months whereas the other one is a dummy variable takes the value of 1 if the individual has a chronical health problem[2]. The ratio of individuals reporting having a physical health problem lasting longer than 6 months sharply increases to 51.3%, which indicates a degradation in the perceived health status of the individuals. Similarly, a sharp increase is observed in the ratio of individuals reporting a chronic illness, representing the evaluated health status, both of which signals a potential increase in health care services need. These two variables are used in this study to represent need variables. Finally, it is possible to argue and increasing trend in health care services utilization, with the exception of a through in GP services in 2012. This study aims to identify the reasons behind the changes in health care service utilization.

This study uses a cross-section probit estimation using 2010, 2012 and 2014 Health Surveys. The Health Surveys conducted by the Turkish Statistical Institute do not follow the same individuals over time; rather apply the surveys to different set of samples each consecutive year. Therefore, it is not possible to use a panel data methodology in this study, which constitutes a limitation to this study and further tackled in the discussion section.

## 3. Results

Table 3 presents the estimation results for 2010. According to the results, women have a higher probability of using GP and outpatient services compared with men. Individuals who are between 25 to 34 years and 35 to 44 years of age have a higher probability of using all types of health care services compared with individuals who are 15 to 24 years of age. Furthermore, the probability of using inpatient health services increases with age as expected. Marital status and insurance status of the individuals also have statistically significant effects on the probability of health service utilization with expected signs. Finally, individuals who report a health problem have higher probability of using all three types of health services.

[1] Turkish Liras converted to USD at the current rate of 3.77.

[2] According to the results of the probit model using "chronic" variable as a dummy, the results of the study is robust to the need variable. For the sake of simplicity, the results of the robustness check are not presented in the paper, however are available from the authors upon request.

**Table 3** Estimation Results for 2010

| Variables | GP | | Outpatient | | Inpatient | |
|---|---|---|---|---|---|---|
| | Coefficients | Marginal effects | Coefficients | Marginal effects | Coefficients | Marginal effects |
| Women | 0.245*** | 0.0927*** | 0.233*** | 0.0829*** | 0.0260 | 0.00401 |
| | (0.0255) | (0.00682) | (0.0260) | (0.00640) | (0.0368) | (0.00413) |
| Age25_34 | -0.0769* | -0.0288** | -0.0637 | -0.0224* | -0.126* | -0.0187*** |
| | (0.0458) | (0.0123) | (0.0460) | (0.0117) | (0.0684) | (0.00667) |
| Age35_44 | -0.139*** | -0.0521*** | -0.139*** | -0.0490*** | -0.450*** | -0.0591*** |
| | (0.0505) | (0.0135) | (0.0509) | (0.0130) | (0.0750) | (0.00504) |
| Age45_54 | -0.0795 | -0.0297** | -0.0899* | -0.0317** | -0.463*** | -0.0600*** |
| | (0.0522) | (0.0140) | (0.0529) | (0.0134) | (0.0764) | (0.00504) |
| Age55_64 | 0.0487 | 0.0182 | -0.0300 | -0.0105 | -0.371*** | -0.0487*** |
| | (0.0562) | (0.0150) | (0.0572) | (0.0144) | (0.0798) | (0.00578) |
| Age65_74 | 0.0954 | 0.0356** | 0.0333 | 0.0116 | -0.240*** | -0.0329*** |
| | (0.0633) | (0.0168) | (0.0651) | (0.0162) | (0.0854) | (0.00712) |
| Age75 | -0.00531 | -0.00198 | -0.0157 | -0.00549 | -0.0899 | -0.0132 |
| | (0.0731) | (0.0195) | (0.0757) | (0.0190) | (0.0940) | (0.00935) |
| Literate | -0.00648 | -0.00242 | -0.0105 | -0.00366 | -0.220*** | -0.0303*** |
| | (0.0521) | (0.0139) | (0.0542) | (0.0136) | (0.0679) | (0.00576) |
| Primary | 0.00870 | 0.00325 | -0.0339 | -0.0119 | -0.137*** | -0.0209*** |
| | (0.0406) | (0.0108) | (0.0424) | (0.0107) | (0.0505) | (0.00503) |
| Middle | 0.135*** | 0.0500*** | 0.0218 | 0.00761 | -0.129* | -0.0190*** |
| | (0.0503) | (0.0132) | (0.0519) | (0.0129) | (0.0679) | (0.00653) |
| Secondary | -0.0131 | -0.00492 | 0.0801 | 0.0278** | -0.0700 | -0.0105 |
| | (0.0496) | (0.0133) | (0.0514) | (0.0126) | (0.0656) | (0.00674) |
| University | 0.0913 | 0.0339** | 0.188*** | 0.0646*** | -0.0510 | -0.00769 |
| | (0.0564) | (0.0149) | (0.0585) | (0.0139) | (0.0769) | (0.00803) |
| Higher | -0.00486 | -0.00182 | 0.414*** | 0.135*** | 0.0853 | 0.0139 |
| | (0.137) | (0.0367) | (0.143) | (0.0304) | (0.191) | (0.0234) |
| Married | 0.270*** | 0.101*** | 0.286*** | 0.102*** | 0.548*** | 0.0745*** |
| | (0.0399) | (0.0106) | (0.0400) | (0.00984) | (0.0629) | (0.00827) |
| Widow | 0.190*** | 0.0705*** | 0.285*** | 0.0967*** | 0.463*** | 0.0894*** |
| | (0.0582) | (0.0152) | (0.0599) | (0.0138) | (0.0837) | (0.0144) |
| Employed | -0.155*** | -0.0581*** | -0.0762*** | -0.0269*** | -0.138*** | -0.0196*** |
| | (0.0269) | (0.00718) | (0.0274) | (0.00698) | (0.0392) | (0.00364) |
| Urban | -0.0251 | -0.00936 | 0.0511* | 0.0179*** | -0.0244 | -0.00380 |
| | (0.0258) | (0.00690) | (0.0264) | (0.00659) | (0.0358) | (0.00393) |
| Insurance | 0.363*** | 0.136*** | 0.411*** | 0.149*** | 0.209*** | 0.0291*** |
| | (0.0359) | (0.00964) | (0.0360) | (0.00902) | (0.0573) | (0.00649) |
| Poor | 0.0357 | 0.0134 | 0.0406 | 0.0142 | 0.0135 | 0.00209 |
| | (0.0352) | (0.00940) | (0.0361) | (0.00897) | (0.0478) | (0.00536) |
| Medium | -0.0100 | -0.00375 | 0.0396 | 0.0138 | -0.0727 | -0.0110** |
| | (0.0361) | (0.00966) | (0.0370) | (0.00919) | (0.0508) | (0.00522) |
| Rich | -0.0332 | -0.0124 | 0.0742* | 0.0258*** | -0.0213 | -0.00327 |
| | (0.0376) | (0.0101) | (0.0385) | (0.00949) | (0.0526) | (0.00569) |
| Very rich | -0.119*** | -0.0445*** | 0.0987** | 0.0343*** | 0.0283 | 0.00443 |
| | (0.0407) | (0.0109) | (0.0416) | (0.0102) | (0.0573) | (0.00652) |
| Problem | 0.416*** | 0.158*** | 0.711*** | 0.253*** | 0.567*** | 0.0938*** |
| | (0.0245) | (0.00639) | (0.0256) | (0.00545) | (0.0337) | (0.00529) |
| Constant | -0.626*** | | -0.723*** | | -1.809*** | |
| | (0.0639) | | (0.0652) | | (0.0930) | |
| Observations | 14,219 | 14,219 | 14,318 | 14,318 | 14,437 | 14,437 |

**Notes:** Standard errors in parentheses, *** $p < .01$, ** $p < .05$, * $p < .1$.

**Source:** Authors' calculations.

Although the coefficients help in analyzing how the probability of using any type of health service changes compared with the reference category, the marginal effects help in indicating the most important factor determining this probability of use. The results indicate that the need variable (problem) has the largest marginal effect in magnitude for GP, outpatient, and inpatient care. This implies that health care need plays a dominant role in the utilization of health care services. On the other hand, health insurance variable has the second largest marginal effect, and this means that enabling factors are more important than the predisposing factors when it comes to seeking health care. In terms of the other determinants of health care utilization in Turkey, it can be argued that the gender of the individual, the place of residence, age, the employment, and marital status of the individual are among the statistically significant factors affecting health care utilization.

Table 4 presents the estimation results for 2012. Similar to 2010, women have a higher probability to use GP and outpatient services than men do. For GP services, a U-shaped trend is observed for the age variable. Individuals between 25 and 54 years have a lower probability of using GP service than 15 to 24 year-old individuals. After aged 55 years, this probability increases compared with 15 to 24 year-old individuals. It is not possible to observe a significant trend for age in other health service types. Similar to 2010, being married or widowed increases the probability of using all types of health care services. Employed individuals have a lower probability of using all three types of health care services compared with those who are not employed, similar to 2010. Being insured also increases an individual's probability of using health services. Different than 2010, residence status significantly affects the probability of using health services. For GP and outpatient services, living in an urban area increases the probability whereas individuals living in rural areas have a lower probability of using inpatient services. As income increases, the probability of using GP and outpatient services increases, whereas no significant relationship is observed for inpatient services. It is expected for inpatient services to be independent of income. Finally, similar to 2010, having a health problem increases the probability of using all three types of health services.

The results show that the need variable (problem) has still has the largest marginal effect, which implies that equity exists in the utilization of health care services according to the behavioral model. The difference of the results of the probit model for 2012 from the other years is that education has become an important determinant of the utilization especially for the GP visits. In a similar vein, the results of 2012 indicate that individuals with higher levels of income are more likely to use GP and outpatient services as compared with individuals with lower levels of income.

Table 5 presents the estimation results for 2014. The data do not provide information regarding residence status in 2014; therefore, results exclude urban variable. Results for gender, age, education, marital status, employment status, insurance status, and health problem are consistent with 2012 results. Income is significant for the "very rich" group for all three types of health services indicating a pro-poor orientation.

**Table 4** Estimation Results for 2012

| Variables | GP | | Outpatient | | Inpatient | |
|---|---|---|---|---|---|---|
| | Coefficients | Marginal effects | Coefficients | Marginal effects | Coefficients | Marginal effects |
| Women | 0.314*** | 0.113*** | 0.280*** | 0.0992*** | -0.00346 | -0.000525 |
| | (0.0185) | (0.00466) | (0.0186) | (0.00470) | (0.0265) | (0.00296) |
| Age25_34 | -0.0931*** | -0.0331*** | 0.0553 | 0.0192** | -0.0347 | -0.00520 |
| | (0.0336) | (0.00894) | (0.0337) | (0.00861) | (0.0518) | (0.00562) |
| Age35_44 | -0.129*** | -0.0461*** | -0.0822** | -0.0289*** | -0.293*** | -0.0399*** |
| | (0.0377) | (0.0101) | (0.0378) | (0.00988) | (0.0572) | (0.00467) |
| Age45_54 | -0.0769** | -0.0273*** | -0.0347 | -0.0121 | -0.358*** | -0.0473*** |
| | (0.0390) | (0.0103) | (0.0391) | (0.0102) | (0.0584) | (0.00440) |
| Age55_64 | 0.0833** | 0.0292*** | -0.00666 | -0.00233 | -0.282*** | -0.0378*** |
| | (0.0421) | (0.0107) | (0.0420) | (0.0108) | (0.0606) | (0.00494) |
| Age65_74 | 0.138*** | 0.0480*** | 0.0930* | 0.0322*** | -0.0600 | -0.00884 |
| | (0.0479) | (0.0120) | (0.0478) | (0.0121) | (0.0642) | (0.00673) |
| Age75 | 0.177*** | 0.0608*** | 0.120** | 0.0414*** | 0.0131 | 0.00200 |
| | (0.0564) | (0.0139) | (0.0565) | (0.0142) | (0.0713) | (0.00812) |
| Literate | 0.0351 | 0.0123 | -0.0300 | -0.0105 | -0.0650 | -0.00953* |
| | (0.0424) | (0.0109) | (0.0427) | (0.0111) | (0.0514) | (0.00534) |
| Primary | 0.143*** | 0.0500*** | -0.0364 | -0.0127 | -0.123*** | -0.0183*** |
| | (0.0317) | (0.00802) | (0.0319) | (0.00826) | (0.0379) | (0.00385) |
| Middle | 0.190*** | 0.0654*** | 0.0591 | 0.0205** | -0.0840* | -0.0123** |
| | (0.0377) | (0.00927) | (0.0380) | (0.00968) | (0.0490) | (0.00503) |
| Secondary | 0.122*** | 0.0423*** | 0.0354 | 0.0123 | -0.117** | -0.0169*** |
| | (0.0371) | (0.00932) | (0.0374) | (0.00959) | (0.0482) | (0.00477) |
| University | 0.187*** | 0.0641*** | 0.158*** | 0.0543*** | -0.0253 | -0.00380 |
| | (0.0411) | (0.0101) | (0.0415) | (0.0103) | (0.0549) | (0.00598) |
| Higher | -0.177** | -0.0637*** | 0.0398 | 0.0138 | -0.280* | -0.0357*** |
| | (0.0896) | (0.0242) | (0.0916) | (0.0234) | (0.153) | (0.0117) |
| Married | 0.310*** | 0.111*** | 0.319*** | 0.113*** | 0.508*** | 0.0685*** |
| | (0.0289) | (0.00734) | (0.0290) | (0.00735) | (0.0460) | (0.00610) |
| Widow | 0.214*** | 0.0735*** | 0.318*** | 0.107*** | 0.436*** | 0.0819*** |
| | (0.0428) | (0.0104) | (0.0430) | (0.0101) | (0.0605) | (0.0104) |
| Employed | -0.175*** | -0.0631*** | -0.0897*** | -0.0316*** | -0.231*** | -0.0303*** |
| | (0.0201) | (0.00542) | (0.0203) | (0.00532) | (0.0297) | (0.00246) |
| Urban | 0.117*** | 0.0416*** | 0.105*** | 0.0370*** | -0.0590** | -0.00911*** |
| | (0.0192) | (0.00495) | (0.0193) | (0.00494) | (0.0260) | (0.00286) |
| Insurance | 0.311*** | 0.113*** | 0.390*** | 0.140*** | 0.213*** | 0.0286*** |
| | (0.0327) | (0.00852) | (0.0332) | (0.00859) | (0.0531) | (0.00603) |
| Poor | 0.0858** | 0.0300*** | 0.0601* | 0.0209** | 0.0465 | 0.00722 |
| | (0.0338) | (0.00860) | (0.0341) | (0.00869) | (0.0451) | (0.00532) |
| Medium | 0.166*** | 0.0576*** | 0.123*** | 0.0426*** | 0.0656 | 0.0102** |
| | (0.0306) | (0.00764) | (0.0308) | (0.00775) | (0.0412) | (0.00491) |
| Rich | 0.134*** | 0.0467*** | 0.137*** | 0.0475*** | 0.0334 | 0.00514 |
| | (0.0315) | (0.00791) | (0.0318) | (0.00795) | (0.0432) | (0.00500) |
| Very rich | 0.115*** | 0.0402*** | 0.208*** | 0.0717*** | 0.000942 | 0.000143 |
| | (0.0316) | (0.00802) | (0.0319) | (0.00792) | (0.0440) | (0.00495) |
| Problem | 0.476*** | 0.168*** | 0.732*** | 0.259*** | 0.523*** | 0.0851*** |
| | (0.0183) | (0.00427) | (0.0185) | (0.00403) | (0.0242) | (0.00380) |
| Constant | -0.767*** | | -0.944*** | | -1.851*** | |
| | (0.0519) | | (0.0526) | | (0.0760) | |
| Observations | 27,727 | 27,727 | 27,773 | 27,773 | 28,017 | 28,017 |

**Notes:** Standard errors in parentheses, *** $p < .01$, ** $p < .05$, * $p < .1$.

**Source:** Authors' calculations.

**Table 5** Estimation Results for 2014

| Variables | GP | | Outpatient | | Inpatient | |
|---|---|---|---|---|---|---|
| | Coefficients | Marginal effects | Coefficients | Marginal effects | Coefficients | Marginal effects |
| Women | 0.379*** | 0.111*** | 0.316*** | 0.0909*** | 0.0530* | 0.00746* |
| | (0.0200) | (0.00591) | (0.0200) | (0.00571) | (0.0276) | (0.00400) |
| Age25_34 | 0.372*** | 0.109*** | 0.489*** | 0.140*** | 0.101* | 0.0148* |
| | (0.0375) | (0.0109) | (0.0377) | (0.0105) | (0.0560) | (0.00868) |
| Age35_44 | 0.413*** | 0.121*** | 0.343*** | 0.0983*** | -0.178*** | -0.0236*** |
| | (0.0418) | (0.0122) | (0.0422) | (0.0119) | (0.0610) | (0.00721) |
| Age45_54 | 0.564*** | 0.167*** | 0.439*** | 0.126*** | -0.147** | -0.0196*** |
| | (0.0434) | (0.0126) | (0.0439) | (0.0123) | (0.0621) | (0.00757) |
| Age55_64 | 0.775*** | 0.228*** | 0.509*** | 0.145*** | -0.0750 | -0.0103 |
| | (0.0463) | (0.0129) | (0.0467) | (0.0129) | (0.0640) | (0.00838) |
| Age65_74 | 0.938*** | 0.270*** | 0.614*** | 0.173*** | 0.182*** | 0.0281** |
| | (0.0529) | (0.0138) | (0.0531) | (0.0141) | (0.0681) | (0.0116) |
| Age75 | 0.906*** | 0.258*** | 0.732*** | 0.203*** | 0.307*** | 0.0507*** |
| | (0.0613) | (0.0159) | (0.0630) | (0.0161) | (0.0756) | (0.0145) |
| Primary | 0.562*** | 0.165*** | 0.466*** | 0.133*** | 0.0409 | 0.00580 |
| | (0.0263) | (0.00766) | (0.0262) | (0.00731) | (0.0338) | (0.00492) |
| Middle | 1.053*** | 0.287*** | 1.018*** | 0.268*** | 0.282*** | 0.0447*** |
| | (0.0312) | (0.00764) | (0.0309) | (0.00721) | (0.0429) | (0.00778) |
| Secondary | 1.007*** | 0.283*** | 1.020*** | 0.278*** | 0.151*** | 0.0227*** |
| | (0.0327) | (0.00836) | (0.0327) | (0.00783) | (0.0450) | (0.00733) |
| University | 1.051*** | 0.295*** | 1.036*** | 0.281*** | 0.260*** | 0.0413*** |
| | (0.0386) | (0.00971) | (0.0388) | (0.00918) | (0.0528) | (0.00953) |
| Higher | 0.638*** | 0.184*** | 0.885*** | 0.238*** | 0.173 | 0.0268 |
| | (0.0883) | (0.0243) | (0.0909) | (0.0218) | (0.132) | (0.0225) |
| Married | 0.425*** | 0.131*** | 0.436*** | 0.133*** | 0.681*** | 0.0901*** |
| | (0.0338) | (0.0106) | (0.0342) | (0.0104) | (0.0514) | (0.00973) |
| Widow | 0.329*** | 0.0971*** | 0.476*** | 0.136*** | 0.550*** | 0.0995*** |
| | (0.0488) | (0.0143) | (0.0500) | (0.0138) | (0.0667) | (0.0153) |
| Employed | -0.0383* | -0.0112* | 0.0742*** | 0.0213*** | -0.106*** | -0.0147*** |
| | (0.0230) | (0.00668) | (0.0232) | (0.00665) | (0.0313) | (0.00406) |
| Insurance | 0.127*** | 0.0368*** | 0.134*** | 0.0384*** | 0.0725 | 0.00986 |
| | (0.0355) | (0.0104) | (0.0353) | (0.0101) | (0.0511) | (0.00726) |
| Poor | 0.00583 | 0.00170 | -0.0504** | -0.0144** | -0.141*** | -0.0190*** |
| | (0.0254) | (0.00740) | (0.0255) | (0.00727) | (0.0336) | (0.00415) |
| Middle | 0.00313 | 0.000912 | 0.0370 | 0.0106 | -0.0706* | -0.00971** |
| | (0.0275) | (0.00801) | (0.0276) | (0.00788) | (0.0361) | (0.00475) |
| Rich | -0.0212 | -0.00620 | 0.00258 | 0.000736 | -0.184*** | -0.0242*** |
| | (0.0277) | (0.00806) | (0.0278) | (0.00795) | (0.0385) | (0.00450) |
| Very rich | -0.106*** | -0.0309*** | -0.0732** | -0.0209** | -0.258*** | -0.0327*** |
| | (0.0306) | (0.00886) | (0.0308) | (0.00880) | (0.0437) | (0.00468) |
| Problem | 0.584*** | 0.186*** | 0.811*** | 0.260*** | 0.617*** | 0.0898*** |
| | (0.0208) | (0.00668) | (0.0214) | (0.00658) | (0.0291) | (0.00581) |
| Constant | -1.952*** | | -1.821*** | | -2.201*** | |
| | (0.0437) | | (0.0430) | | (0.0622) | |
| Observations | 26,075 | 26,075 | 26,075 | 26,075 | 26,075 | 26,075 |

**Notes:** Standard errors in parentheses, *** $p < .01$, ** $p < .05$, * $p < .1$.

**Source:** Authors' calculations.

When the marginal effects of the need variable are compared over time, we can see significant increases in GP and outpatient services. This increasing trend indicates that over time, GP services and outpatient services utilization have become more equitable. On the other hand, the marginal effect of the need variable is at its highest for inpatient services in 2010. Therefore, we can conclude that there is a decrease in the level of equity in terms of inpatient services. This result is not surprising considering most of the policy changes after 2008 in Turkey focuses on GP services and outpatient services rather than inpatient services.

## 4. Discussion

This study mainly aims to identify the differences based on individual socio-economic characteristics in terms of health care service utilization. As Von Lengerke, Gohl, and Babitsch (2014) points out, health care seeking is a process that varies between individuals. Usually, individuals are expected to seek health care more rapidly in alarming situations; however, they might choose to delay their health care needs in non-urgent situations depending on certain individual characteristics, such as gender, income, education, or insurance status. Therefore, differences in health seeking behavior is expected. This study incorporates Andersen's (1968) behavioral model and probit estimation with a focus on equity for Turkey to assess the main characteristics of health seeking behavior for Turkish adults. In line with expectations, the results indicate that different factors affect different types of health care service use, and it changes over time.

One of the concepts of the behavioral model is mutability, which means that factors that can be changed and transformed in the short-term to increase the level of utilization of health care services, especially in the disadvantaged segments of society, which are called "mutable" factors in the behavioral model (Aday and Andersen 1974). Predisposing factors (e.g. age, gender) have the lowest degree of mutability among the components of the behavioral model, whereas the variable group, having the highest level of mutability among the components of the behavioral model has the enabling factors (e.g., income, health insurance). The level of mutability, being one of the important emphasis of the behavioral model, is vital in determining the instruments in health policy. In this regard, we have found that health insurance has the second largest marginal effect after the need variable for all years and all types of health care. This implies that policy makers in Turkey should focus on enabling factors, especially the coverage of health insurance and the level of income, to increase health care utilization of the disadvantaged segments of the population. Another policy recommendation would be reorganizing the out-of-pocket expenditures, so that it does not constitute an obstacle in terms of health service utilization. In addition, the level of mutability of the distribution of general population among urban/rural and between regions is significantly low. However, reorganizing the health staff and institutions among regions and urban/rural can be used as an effective policy tool.

On the other hand, the main finding of our study is that the health system structure in Turkey is based on need, which has also a high level of mutability in the model. To be specific, need is seen as the direct cause of health services utilization. However, it is possible to argue that perceived level of need is related with health service

utilization and, therefore, education programs designed to increase individuals' health knowledge can play an important role in increasing/decreasing individuals' health service utilization levels. Similarly, evaluated need also has a potential to affect health service utilization (Andersen 1995). In fact, most studies indicate that the evaluated level of need may increase health expenditure due to causing unnecessary increases in supply-induced demand. In this context, because need is interpreted as the main reason of utilization, and due to the difficulties and fuzziness in its definition, it is problematic to fully perceive the level of mutability of need in the model. Even though this study does not offer a direct program evaluation, it can be argued that the results indicate the HTP helped in forming an equitable system, and changes to this program and policies affect the notion of equitable access in Turkish health care system.

Finally, it is important to acknowledge that there are some limitations to this study. First, the study is limited with the behavioral model. To check the sensitivity of the results, we have used two different health care need dummy variables. However, stating that equity exists in the utilization of health care services, based on the findings of our study, still needs a more robustness checking using different models and variables. Second, we can state that our main finding, which is the health system structure in Turkey, is based on need and, therefore, equity exists in the utilization of health care services and does not change with time. However, using panel data methods, which allows analyzing units over time rather than one point in time, may reveal the progress of equity over time more precisely.

## 5. Conclusion

In this study, we have examined the equity phenomenon in the utilization of health care services in Turkey (out-patient and in-patient treatment services, separately) in the context of the behavioral model using the "Health Survey's" obtained from the Turkish Statistical Institute for 2010, 2012 and 2014. In addition, we have investigated the determinants of health care utilization for the years considered in the analysis. Equity phenomenon in the utilization of health care services has never been questioned using the behavioral model for Turkey and, therefore, this study makes an important contribution to the existing literature. Further, as mentioned above, there is only one study focusing on inequity in utilization of health care services in Turkey (Sözmen and Ünal 2016). Their results indicate that wealthier individuals are more likely to use specialist and dental care as compared with poorer individuals whereas the picture is the opposite for emergency care, inpatient care and GP. Our study differs from the other studies focusing on equity in health care utilization by using the probit model and by investigating the issue in the context of the behavioral model.

The results of the analysis indicate that the health system structure in Turkey is based on need and, therefore, equity exists in the utilization of health care services. However, the large marginal effect of health insurance variable for all years and all types of health services implies that enabling factors also play a dominant role in the utilization of health care services in Turkey. In addition, it can be argued that the measurement of health care need has important implications for the results obtained. To be specific, we have used two different health care need dummy variables to check the robustness of the findings and have found the similar results for all types of health care

services. This finding has confirmed that health care need is the first and the most important factor when the individuals make a decision to seek health care.

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