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Research Article

NEET Status and Mental Health Disorders: Evidence from a Developing Country[a,b]

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The extant literature defines the young individuals engaged in neither employment nor education or training program as "NEET". This study investigates the relationship between being NEET and the probability of having mental health disorders among youth in Turkey. We conducted a bivariate probit model with selection by utilizing data from the Turkish Health Surveys (THS) of 2014, 2016, and 2019. The results indicate that the probability of being NEET increases with age, being women and married. In addition, the parents' education and wealth statutes are found to be important determinants of a young individual's NEET status. The value of the correlation coefficient (1.69) in the probit model indicates that there is a positive association between being NEET and experiencing mental health disorders and that some unobserved factors (i.e., access to mental health services, psychosocial support, cultural factors) are positively related to experiencing mental health disorders. We conclude that the circumstances causing young people to be unemployed also tend to make them have mental health disorders, but unemployed NEET with higher levels of education are less likely to experience mental health disorders.

JEL codes: I12, I19, J21

Keywords: Mental health disorders, NEET, Turkey, Developing country, Bivariate probit models with selection

1 Introduction

Youth unemployment and inactivity are major concerns worldwide, especially after the global financial crisis of 2008/9, which led to structural changes in the world economy and disproportionately affected young people (Shierholz et al., 2012; ILO, 2013). For instance, some young adults cannot find a suitable job due to the lack or mismatch of skills or psychosocial impediments, whereas some of them are employed in insecure or informal positions. Moreover, many young individuals become discouraged by the apparent hopelessness of poor

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economic conditions. Consequently, the transition from school to the labor market becomes more challenging in times of economic contraction. Young people who drop out of school and lack access to work or training are especially affected by these circumstances.

The current literature defines the young individuals who are engaged in neither employment nor education or training programs as "NEET." The prevailing literature often oversimplifies the categorization of NEET, defining them as individuals who are unemployed, inactive non-students. However, this approach overlooks the complexity of the situation, as it fails to account for the existence of students who may also be unemployed. International labor force statistics standards, as outlined by Hussmanns et al. (1990), recommend that the activity status of current students should be assessed using the same criteria as the non-student population. Accordingly, a student who engaged in at least one hour of work during the reference week is classified as employed, while a student who did not work, was available for employment, and actively sought work is categorized as unemployed (ILO, 2015).

Turkey's economic downturn in late 2018, owing to the financial crisis, global downturn, and the 2018 Turkish exchange rate crisis, not only marked the conclusion of a period of expanding employment opportunities but also resulted in the loss of over 700,000 jobs. This downturn had a notable impact on young individuals, manifesting in a more challenging labor market, as evidenced by increases in the NEET rate (from 21.9% to 23.5%, 2018-2019) and the youth unemployment rate (from 20.3% to 25.4%, 2018-2019) (ILO, 2023). Subsequently, with the resurgence of economic growth, the arrival of the COVID-19 pandemic in Turkey further exacerbated the NEET rate, reaching 27.9% of the population, compared to 12.6% average across the OECD countries with estimates indicating 17.3% for men and 39% for women aged between 15-29 (OECD, 2017).

Furthermore, the issue of low-level educational attainment poses a significant challenge in Turkey with respect to NEETs. Between 2014 and 2018, the rate of early school leavers decreased by 5% and 10% for young men and women in Turkey, respectively. Although there has been progress in narrowing the gender gap, policies implemented by various entities, including the state, national governmental organizations, public institutions, and international non-governmental organizations, have had a discernible impact on reducing school dropout rates among the young population in recent years. However, early exits from education and training remain crucial in shaping the composition of NEETs in Turkey, as low-level educational attainment influences the school-to-work transition and entry into the labor market for the young population (Madra et al., 2018).

Therefore, Turkey is a country that draws increasing attention in the global context. The study's findings have the potential to advance our understanding of the relationship between NEET status and mental health, particularly in the context of a developing country. By examining the specific nuances of this association within the unique socioeconomic and cultural landscape of the country, the research aims to contribute valuable insights that may inform targeted interventions, policies, and support mechanisms for individuals facing NEET challenges in the given setting. This nuanced exploration is crucial for the development of effective strategies to address mental health concerns among NEET individuals in the context of developing nations.

This paper aims to systematically and thoroughly examine the effects of being NEET on the prevalence of mental health disorders among Turkish youths aged 15 to 29. We conducted an empirical analysis using data from the 2014, 2016, and 2019 rounds of the Turkish Health Survey (THS). This study provides an important contribution by utilizing hetero-

geneity in NEET groups by taking into account the diverse characteristics within the NEET group, such as unemployed and inactive individuals. This sub-categorization is crucial for interpreting our results because the NEET group includes different degrees of vulnerability, such as unemployed persons who are actively seeking a job and inactive persons who are neither seeking a job nor applying for training programs. In the empirical analysis, we employed a bivariate probit model with selection. This method is particularly well-suited to handle the heterogeneity present in our data as it captures the complex interactions and dependencies between NEET status and mental health outcomes, considering the presence of unobserved variables that affect both. By modeling these relationships simultaneously, we gain a better understanding of how various factors within the NEET group can influence mental health outcomes. Furthermore, we controlled for both the young individuals' and their parents' demographic and socioeconomic characteristics in the empirical analysis. In addition, the majority of research on this topic is mostly dominant in health literature. One distinctive feature of these studies is their robust methodology, particularly in terms of econometric analysis, setting them apart from other research in the field. Furthermore, these studies commonly account for the socioeconomic influence of the family, a critical factor in understanding the relationship between NEET status and mental health. However, it's worth noting that this consideration is often absent in many studies within the broader academic landscape, which can potentially lead to incomplete or less accurate assessments of the association between NEET status and mental health outcomes. The importance of controlling family socioeconomic variables becomes evident when addressing the complex interplay between individual circumstances and broader social and economic factors in shaping mental health outcomes among NEET individuals.

The empirical findings indicate that being NEET and having mental health disorders are not affected by the same set of unobservables. However, when we divided the NEET population into two subgroups, we obtained different results. Our findings suggest that obligations or incapacities that cause unemployment for young individuals also tend to cause mental health disorders for these individuals since the probability of being an unemployed NEET and having mental health disorders are positively correlated with regard to error terms. The mental health of unemployed NEET may deteriorate due to pessimism about the near future and psychosocial difficulties faced while searching for a suitable job. Hence, we assert that policymakers should focus on different subgroups within NEET and design interventions accordingly to improve the chances of work or education participation of NEET youths. In addition, the probability of mental health disorders mainly stems from personal characteristics rather than parental characteristics; specifically, unemployed NEETs with higher levels of education are less likely to experience mental health disorders. Thus, we conclude that the probability of both being NEET and having mental health disorders decreases with higher levels of education.

The rest of the paper is as follows. Section 2 reviews the related literature. Section 3 explains the data and methodology we employed and presents descriptive statistics. Section 4 presents the estimation results. Section 5 provides study conclusions and implications for researchers and policymakers, and Section 6 concludes.

2 Literature Review

Education and work are essential sources of social inclusion that have a favorable impact on the mental health of individuals. The NEET is at risk for numerous poor psychosocial and health outcomes since they do not acquire skills and socialize through the channels of employment, education, or training (Mascherini et al., 2012). Therefore, the NEET can be referred to as socially excluded groups with a significant amount of financial burden; thus, they face significant lifelong vulnerability and risk of mental health disorders. Investigating the health consequences of being NEET represents a critical area of research since the higher prevalence of NEET, especially in developing countries, reveals not only life-long consequences for NEET youth themselves but also imposes substantial direct and indirect costs for economies through the risk of social elimination for NEET and loss of income tax revenue due to work exclusion (Bania et al., 2019). For instance, researchers in Norway have argued that the generous social and financial security benefits that discourage youth from participating in the Norwegian labor market pose direct costs to the Norwegian government (Lorentzen et al., 2014). Hence, the negative effects of being NEET extend beyond the mental health of individual young people to impact whole economies and societies. According to the World Health Organization, mental health disorders cost the world economy $2.5 trillion in 2010 and are expected to cost $6 trillion by 2030 (WHO, 2011). Therefore, analyzing the impacts of being NEET together with other socioeconomic factors impacting the probability of experiencing mental health disorders is crucial for both individuals and the societies and economies that they are a part of.

Since NEET ratios differ significantly between developed and developing countries, estimates from a particular country cannot be generalized to other countries given the heterogeneities among the same income group (Baggio et al., 2015; Gutiérrez-García et al., 2017). The limited current literature on the relationship between NEET status and mental health disorders generally presents evidence from developed countries, with a few exceptions (see Gladwell et al. 2015 for the UK; Henderson et al. 2017 and Iyer et al. 2018 for Canada; Holloway et al. 2018 for Australia; Benjet et al. 2012 and Gutiérrez-García et al. 2017 for Mexico; and Baggio et al. 2015 and Basta et al. 2019 for Greece). In addition, these studies generally employ a specific sample, such as young individuals in mental health centers, males in military services, and specific age groups, rather than a fully representative sample as we utilize in this study. Therefore, the large sample in this study accurately reflects the characteristics of the entire population, which assures making inferences and generalizations about the entire population based on the analysis of the sample data. Moreover, the literature indicates that NEET status is closely related to the poor educational background of individuals, as well as the socioeconomic status of parents (Bania et al., 2019; Ofsted, 2010; Maguire, 2013). Therefore, the education levels of both young people and their parents serve as the primary determinants of NEET status. Also, the extant literature shows that unemployed young individuals, who form a large portion of the NEET population, are more likely to experience mental health problems (Kamerāde & Bennett, 2018). Furthermore, the studies are generally based on descriptive analyses rather than econometric analyses. Given the scarce evidence from developing countries and the lack of detailed investigation about NEET in the literature, investigating the impact of education and labor market disengagement on young individuals' mental health status is particularly important for Turkey: a middle-income developing country with one of the highest NEET percentages.

A recent systematic review conducted by Gariépy et al. (2022) delved into the directional relationships between mental health problems and the risk of becoming NEET. The review emphasized findings from various longitudinal studies, indicating that early-age mental health issues raise the susceptibility to NEET status. These findings align with research by Goldman-Mellor et al. (2016), López-López et al. (2020), O'Dea et al. (2016), Power et al. (2015), and Rodwell et al. (2018), which predominantly support this directionality. However, it's worth noting that only a limited number of studies provided evidence for the reverse relationship, as exemplified by Gutiérrez-García et al. (2017).

Moreover, the literature indicates that NEET individuals tend to grapple with mental health issues more frequently than their non-NEET counterparts. Studies have shown that NEET individuals face an elevated risk of experiencing conditions like depression and anxiety (Feng et al., 2015), and they are more likely to exhibit severe symptoms of these disorders (Basta et al., 2019; O'Dea et al., 2014). The relationship between mental health and NEET status is complex and potentially bidirectional. On one hand, pre-existing mental health conditions can serve as risk factors for becoming NEET. On the other hand, being NEET may lead to long-term mental health problems. For example, a British cohort study found that nearly 60% of NEET had encountered mental health problems during childhood or adolescence, in contrast to 35% of non-NEET (Goldman-Mellor et al., 2016). Furthermore, associations between NEET status during adolescence and various mental health outcomes in adulthood have been established (Gutiérrez-García et al., 2017; Power et al., 2015).

Our study is pertinent to recent research that links NEET status with mental health issues. For example, Minh et al. (2023) examined the relationship between adolescent mental health and early adult labor market disconnection, specifically NEET, in the Netherlands. The research found that among young men, clinical levels of externalizing symptoms during adolescence were associated with a higher probability of NEET, with educational attainment mediating a portion of this effect. However, no significant mediation was observed for young women or the relationship between internalizing symptoms and NEET in either gender. In summary, externalizing symptoms appear to disrupt educational attainment, leading to a higher likelihood of NEET in young men, with a smaller role in young women. Plenty et al. (2000) investigate the connection between mental health issues and the likelihood of being NEET during young adulthood, focusing on the roles of internalizing and externalizing problems for the sample of 4,452 Swedish youth. They reveal that greater internalizing and externalizing problems during adolescence predict lower school grades and reduced upper secondary school completion, affecting the risk of NEET status.

Recently, studies showed that the mental health challenges experienced by NEET individuals may have been exacerbated by the effects of the COVID-19 pandemic (Kvieskienė et al., 2021). Quinlan-Davidson et al. (2023) found that while NEET youth had a higher likelihood of screening positive for internalizing disorders compared to their non-NEET counterparts at baseline, the study found that sociodemographic factors, including age, gender identity, ethnicity, and area of residence, had a significant impact on mental health.

Karaoğlan et al. (2022) conduct the first study that considers the mental health disorders of youth in Turkey. In that study, the authors investigate the relationship between NEET status and the likelihood of experiencing mental health issues, as well as engaging in risky health behaviors like smoking and alcohol consumption, among young individuals in Turkey by implementing logit regression analyses. It also explores the connection between mental health problems, risky health behaviors, and parental socioeconomic status. The empirical

analysis, based on the THS data of 2014, 2016, and 2019, reveals that NEET status is associated with an increased probability of mental health problems and obesity. In contrast to them, our study concentrates specifically on the mental health status of NEET individuals. Additionally, we employ a bivariate probit model with selection to address both endogeneity and heterogeneity between the likelihood of being NEET and experiencing mental health disorders due to unobserved factors. The methodological distinction sets our research apart from Karaoğlan et al. (2022) and strengthens the robustness of our findings. Our study seeks to shed light on the unique relationship between NEET status and mental health, offering a more comprehensive analysis in this domain.

3 Data

This study analyzed data from the three rounds (2014, 2016, and 2019) of the THS conducted by the Turkish Statistical Institute (TurkStat).[1] The TurkStat selects a nationally representative sample of households within the borders of Turkey, and the data are collected by face-to-face interviews with all individuals in these households.

The primary variable under investigation in this study is a mental health disorder indicator. It assumes a value of one when a respondent reports experiencing symptoms, such as depression, feeling depressed, anxiety, displeasure in doing things, difficulty falling asleep, tiredness, poor appetite, and/or concentration problems, with a frequency characterized by their response categories as "More than a week" or "Almost every day." In contrast, if respondents report experiencing these symptoms "Never" or "Some days," the variable takes a value of zero, indicating that the symptoms were either not present or occurred with lower frequency. We apply the same procedure to all mental health-related variables, and we define the individual as having a mental health disorder if s/he frequently experiences one or more than one of these symptoms. Individuals who have not completed primary education, are non-literate, or have graduated from elementary school are categorized under the label "primary edu". Those with a general high school, vocational or technical high school, or lower secondary education background are grouped as "middle edu". Individuals who have completed general high school, vocational or technical high school, or equivalent education fall under the classification of "high edu". Those who have graduated from a 2 or 3-year college, a 4-year college, or faculty are designated as "university edu". Furthermore, individuals holding a master's degree (including 5 or 6-year faculties) and doctorate degrees are defined as having "postgraduate education". We generated five binary variables corresponding to a specific range (based on the predefined thresholds provided by the TurkStat) of household income, which allows us to examine the distribution of individuals across different levels of economic well-being. Other demographic variables, such as marital status and gender, are also considered in the analyses.

Following the OECD criteria, individuals aged 15-29 were classified as "young people". Since the THS data set does not identify whether young participants are enrolled in a training program or not, our study classified the NEET as the group of young individuals aged between 15 and 29 who are in neither employment (i.e., unemployed, economically inactive, and seasonal workers) nor in education. To determine an individual's NEET status, we

[1] We used these rounds as they are structurally consistent with each other but differ from the 2008, 2010, 2012 rounds.

Table 1: Education Enrollment Status by Reported Age and Completed Education Level

Age Cohorts	Reported Completed Education Level		
	Primary or middle school	**High School**	**University or Higher**
15-19	Not enrolled in education	Not available	Not available
20-24	Not enrolled in education	Not enrolled in education	Not available
25-29	Not enrolled in education	Not enrolled in education	Not enrolled in education

first considered that individual's employment status in the THS data set before controlling for their reason for not working and the years of schooling. For nearly 20% of the sample who did not report their reason for not working, we utilized the data on their age and completed education level. Table 1 summarizes the algorithm that is applied to determine an individual's current educational status. In the 15-19 age group, if a respondent reports the completion of primary or middle school, we infer that the respondent is not currently enrolled in an educational program, thus is NEET. For the 20-24 age group, if a respondent discloses their status as a graduate of primary, middle, or high school, we deduce that the individual is not presently enrolled in education and accordingly designate them as NEET. Within the 25-29 age cohort, it is presumed that a respondent reporting the attainment of any degree is no longer actively participating in educational pursuits, hence classifying them as NEET. Conversely, individuals who report their employment status or current enrollment in an educational program are identified as non-NEET throughout the analyses. If the respondent was considered as not enrolled in education in Table 1 and reported that they were not employed, then that individual could be classified as NEET.

Table 2: Summary of Sample Characteristics

	Full Sample		**NEET**		**non-NEET**	
Variables	Mean	SD	Mean	SD	Mean	SD
Having a mental health disorders	0.17	0.38	0.21	0.41	0.16	0.37
Demographic variables						
Age	21.9	4.42	23.79	3.87	21.28	4.39
Age squared/100	4.99	1.95	5.86	1.77	4.65	1.91
Male	0.46	0.5	0.22	0.41	0.56	0.50
Marital Status						
Single	0.7	0.46	0.41	0.50	0.82	0.38
Married	0.3	0.46	0.58	0.50	0.18	0.39
Education level						
Primary or below	0.11	0.31	0.25	0.43	0.05	0.22
Middle school	0.41	0.49	0.41	0.49	0.41	0.50
High school or above	0.48	0.5	0.33	0.47	0.53	0.50
Wealth index						
Bottom 20%	0.24	0.43	0.34	0.47	0.20	0.40
Second 20%	0.23	0.42	0.28	0.45	0.19	0.40
Third 20%	0.18	0.39	0.17	0.38	0.18	0.39
Fourth 20%	0.19	0.40	0.13	0.34	0.22	0.41
Top 20%	0.16	0.36	0.07	0.26	0.19	0.40
Parents' education						
Primary or below	0.52	0.50	0.41	0.50	0.56	0.50
Middle school	0.05	0.22	0.03	0.15	0.06	0.24
High school or above	0.11	0.31	0.03	0.17	0.14	0.34
Number of Respondents	13,533		3,832		9,701	

Notes: The percentages represent the proportion of individuals in each age group who are either NEET or non-NEET.

Table 2 shows the descriptive statistics of the variables for 13,533 young people in our sample, of which 3,832 are NEET and 9,701 are non-NEET individuals. Regarding the variable of interest, the mean differences suggest that NEET is more likely to have mental health disorders. In general, NEET has lower levels of education compared to non-NEET; 25% of NEET reports primary school as their highest educational attainment, compared to 5% of non-NEET. While 33% of NEETs reported attaining a high school diploma or higher level of education, 53% of non-NEETs had the same credentials. Similarly, NEET tends to come from a disadvantaged family background; we observe a uniform distribution over income deciles for non-NEETs, but most of the NEETs are in the bottom decile (34%). Additionally, NEET is more likely to have parents who are less educated than their non-NEET peers. The results of a two-sample t-test to compare employment rates between NEET and non-NEET groups indicated statistically significant differences.

4 Methodology

The theoretical background of this study derives from the argument that individuals with low socioeconomic status experience high psycho-social stress and poorer health outcomes (Cutler et al., 2011). Thus, we expect that high levels of psycho-social stress will deteriorate an individual's mental health status. In addition, we hypothesize that this negative effect varies depending on different degrees of vulnerability, personal characteristics, and obligations experienced by NEET. For instance, some NEET has little or no control over their situation, such as the young unemployed, sick or disabled, and early-career professionals, whereas some others have full control over their situation, including those who are not seeking jobs or applying for education and are not constrained from doing so by other obligations or incapacities, as well as those engaged in leisure activities such as art or travel (Mascherini et al., 2012). Therefore, we conducted our analyses for the main sample, so-called Sample 1, including all young individuals aged between 15-29, and two sub-samples. Sample 2 comprises non-NEET and the NEET who are unemployed and not enrolled in education, and, finally, Sample 3 comprises non-NEET and NEET who are inactive and not enrolled in education.

Standard probit/logit models are potentially inadequate and may yield biased estimates in the presence of self-selection bias due to their assumption of independence between the decision to be in the treatment group (e.g., NEET status) and the outcome variable (e.g., mental health outcomes), in situations where individuals self-select into a particular group based on unobservable factors that also influence the outcome. Therefore, the selection bias problem can pose an obstacle to estimating the effect of being NEET on an individual's mental health by applying simple probit/logit techniques. If we illustrate the problem with an example, young individuals with lower levels of education are more likely to be NEET; hence, there may be a group of young individuals with lower levels of education when estimating the health outcome in our sample. This constitutes the non-random aspect of the estimation sample. Young individuals with higher levels of education may also be NEET, most likely due to unobservable (such as time preferences). These individuals are also incorporated into our sample, not because they have lower levels of education but because they have large error terms. However, the young individuals with lower levels of education in our sample have normal ranges of error terms. Therefore, probit/logit models may underestimate the effect of education on the probability of having mental health disorders. Hence,

the bivariate probit model with selection enables us to reveal self-selection bias and make a more accurate assessment of how NEET status impacts the probability of having a mental health disorder as it allows for the simultaneous modeling of the selection process (NEET status) and the outcome equation (mental health outcomes). This enables the incorporation of the correlation between unobserved factors influencing both the likelihood of being NEET and having mental health disorders. By accounting for this correlation, the bivariate probit model provides a more accurate representation of the relationship under investigation and helps mitigate the potential biases associated with self-selection.

Before presenting our empirical model, we will briefly revisit our hypothesis; educational and occupational pursuits exhibit a positive correlation with cognitive and mental health (e.g., Modini et al., 2016; Vance et al., 2016; Hergenrather et al., 2018; Chen et al., 2019). Engagement in educational and professional endeavors necessitates the acquisition of new skills, the establishment of objectives and routines, and active social interaction. These activities contribute to overall well-being by fostering occupational and social support networks while enhancing cognitive functioning (e.g., O'Dea et al., 2014; Vance et al., 2016). Conversely, discontinuing education or becoming disconnected from the labor market exposes young individuals to elevated risks of social exclusion, psychological distress, disability, maladaptive behaviors, and health issues (e.g., O'Dea et al., 2014; Fernández-Suárez et al., 2016; Hjorth et al., 2016). Based on these frameworks, we hypothesize that being neither in employment nor in education (NEET) among youth in Turkey is associated with an increased probability of having mental health disorders. Additionally, we expect that higher levels of education among unemployed NEETs are linked to a reduced likelihood of experiencing mental health disorders.

In the empirical analysis, we estimated the following two-equation structural system. The selection equation is specified by:

$$NEET_i^* \;=\; x_i^{'}\alpha \;+\; u_i \tag{1}$$

where NEET is a dummy (equals to 1 if the individual is NEET, 0 otherwise), x_i includes individual and parental characteristics as well as region and survey dummies, and u_i indicates the error term. After the selection equation is implemented, the probit model is demonstrated as

$$MHD_i^* \;=\; x_i^{'}\beta \;+\; \epsilon_i \tag{2}$$

where MHD_i^* is mental health disorders, the vector x_i are defined as in equation (1) and ϵ_i indicates the error term. In addition, $MHD_i^* > 0$ (MHD_i=1) and $MHD_i^* < 0$ (MHD_i=0) signify whether individuals have or do not have mental health disorders, respectively.

If error terms in equations (1) and (2) are dependent on each other because of endogeneity, estimating equation (2) in the univariate probit model provides inconsistent estimates. Therefore, we first checked the correlation coefficient (ρ) between the two equations and elaborated on the coefficients obtained from estimating equation (2). This coefficient indicates the degree of association between the error terms in the two equations, which represent the unobserved factors influencing the outcomes. A positive correlation suggests that the unobserved factors affecting the decision to be in a certain category are positively related to the unobserved factors influencing the outcome variable. Conversely, a negative correlation implies an inverse relationship. Understanding the correlation coefficient helps researchers

discern whether the observed relationship between NEET status and mental health outcomes is driven by common unobserved factors or whether the two outcomes are influenced independently. It enhances the nuanced interpretation of results and contributes a more comprehensive understanding of the complex relationship between NEET status and mental health. A positive value of ρ in our context suggests that individuals who are more likely to be in the NEET category are also more likely to experience the mental health outcome, and vice versa. This indicates a simultaneous relationship between NEET status and mental health outcomes. On the other hand, a negative correlation implies that the factors influencing NEET status are negatively related to those affecting mental health outcomes, suggesting a potential compensatory mechanism.

5 Results

Table 3 presents the marginal effects obtained from the selection equation. We estimate the selection equation for three different specifications: We first control for individual characteristics (columns 1, 4, and 7), then we include household wealth index (columns 2, 5, and 8) and parents' education level (columns 3, 6, and 9) to overcome the potential bias due to endogeneity. The results show that the probability of being NEET increases with age. Women are more likely to be NEET than men, and married individuals are more likely to be NEET compared to their single peers. A young individual's level of education is also an important determinant of NEET status; the highest completed level of education of both a young individual and their parents significantly affects that individual's probability of being NEET. Our results suggest that individuals with higher levels of education are less likely to be NEET. Likewise, young individuals whose parents have higher levels of education have lower probabilities of being NEET. Finally, young people who belong to households with lower wealth indices have a higher chance of being NEET. Therefore, we can say that parental socioeconomic status has an important impact on a young individual's NEET status.

Table 4 presents the marginal effects obtained from the probit model for three different samples. First, the values of the correlation coefficient (ρ) obtained from the bivariate probit model with selection estimation have negative signs in specifications utilizing Sample 1 and Sample 3, but it is positive in specifications employing Sample 2. To illustrate, ρ is significant in only the base model employing Sample 2 and all specifications employing Sample 3. Therefore, we conclude that being NEET and having mental health disorders are not correlated in terms of error terms, but this finding is not valid when we divide the NEET population into two sub-samples. Column 4 in Table 4 shows that the value of ρ is estimated at 1.69, which is positive and statistically significant, indicating that there is a positive association between being NEET and experiencing mental health disorders. It also implies that some unobserved factors (i.e., access to mental health services, psychosocial support, cultural factors) that increase young individuals' probability of being NEET also increase the probability of mental health disorders among this population. In contrast, Sample 3 demonstrated significant negative rho values for all specifications. This means that factors leading to NEET among youths are negatively associated with the likelihood of having mental health disorders. Therefore, we conclude that the obligations or incapacities that cause unemployment for young individuals also tend to cause these individuals to have mental health disorders.

Table 3: The Probability of Being NEET (Ages 15–29) (Selection Equation)

	Sample 1			**Sample 2**			**Sample 3**		
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	0.169***	0.155***	0.154***	0.109***	0.062***	0.061***	0.118***	0.075***	0.074***
	(0.009)	(0.01)	(0.01)	(0.01)	(0.014)	(0.014)	(0.008)	(0.011)	(0.011)
Age squared/100	-0.328***	-0.298***	-0.297***	-0.173***	-0.035	-0.035	-0.214***	-0.094***	-0.094***
	(0.02)	(0.023)	(0.023)	(0.023)	(0.031)	(0.031)	(0.018)	(0.025)	(0.025)
Male (ref. female)	-0.205***	-0.207***	-0.207***	0.051***	0.062***	0.062***	-0.215***	-0.098***	-0.093***
	(0.006)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)
Married (ref. single)	0.115***	0.114***	0.111***	-0.074***	0.029*	0.024	0.175***	0.187***	0.177***
	(0.008)	(0.01)	(0.01)	(0.011)	(0.016)	(0.016)	(0.007)	(0.009)	(0.009)
Education level (ref. primary or below)									
Middle school	-0.089***	-0.078***	-0.078***	-0.023	-0.02	-0.021	-0.090***	-0.100***	-0.096***
	(0.011)	(0.013)	(0.013)	(0.015)	(0.019)	(0.019)	(0.01)	(0.012)	(0.012)
High school and above	-0.283***	-0.240***	-0.238***	-0.172***	-0.241***	-0.238***	-0.269***	-0.323***	-0.312***
	(0.01)	(0.012)	(0.012)	(0.014)	(0.021)	(0.021)	(0.01)	(0.014)	(0.014)
Wealth index (ref. bottom 20%)									
Second 20%		-0.021*	-0.020*		-0.007	-0.005		0.003	0.007
		(0.011)	(0.011)		(0.011)	(0.011)		(0.009)	(0.009)
Third 20%		-0.061***	-0.059***		-0.039***	-0.035***		-0.023**	-0.015
		(0.012)	(0.012)		(0.012)	(0.012)		(0.01)	(0.01)
Fourth 20%		-0.111***	-0.109***		-0.045***	-0.040***		-0.039***	-0.029***
		(0.012)	(0.012)		(0.012)	(0.012)		(0.01)	(0.01)
Top 20%		-0.161***	-0.155***		-0.063***	-0.051***		-0.049***	-0.027**
		(0.014)	(0.014)		(0.015)	(0.015)		(0.013)	(0.013)
Parents' education (ref. primary or below)									
Middle school			-0.025			-0.006			-0.068***
			(0.02)			(0.016)			(0.019)
High school or above			-0.036**			-0.038***			-0.071***
			(0.016)			(0.013)			(0.013)
Number of Respondents	13,319	9,288	9,288	7,413	4,201	4,201	9,258	5,568	5,568

Notes: Marginal Effects are reported, and the clustered robust standard errors are given in the parenthesis. ***, **, and * indicate the marginal effects is significant at 1%, 5%, and 10%, respectively. The marginal effects for the THS dummies (2014, 2016, and 2019 dummies) and region dummies (12 NUTS-1 regions of the country) are not shown in the table. Sample 1 consists of all young individuals aged between 15-29, Sample 2 comprises non-NEET, and the NEET who are unemployed and not enrolled in education, and, finally, Sample 3 comprises non-NEET and NEET who are inactive and not enrolled in education.

Regarding the other control variables, male NEET generally has a higher probability of mental health disorders than females. Male NEET is 17% more likely to have mental health problems than women for the whole sample (Sample 1). Two factors may contribute to the higher probability of mental health disorders among male NEET individuals compared to females. Firstly, traditional gender roles and societal expectations may place unique pressures on males, influencing their mental health outcomes. The stigma associated with male vulnerability and the societal expectation for men to conform to certain roles, such as being the primary breadwinner, could contribute to increased stress and mental health challenges. Secondly, females, in general, tend to have stronger social support networks and are more likely to seek and receive emotional support. This support can act as a protective factor against mental health disorders. Males, on the other hand, maybe less inclined to openly discuss their mental health struggles, leading to a lack of adequate support. In addition, married individuals are less likely to experience mental health disorders than their single peers in estimations. Married NEET is 12% less likely to have mental health disorders than single youths for Sample 1. The marginal effects are -2% and -11% for unemployed NEET (Sample 2) and inactive NEET (Sample 3), respectively. Moreover, a young individual's education level has a preventative effect on the probability of experiencing mental health disorders for unemployed NEET. Table 4 (columns 4-6) suggests graduating from high school and above degrees decreases the likelihood of having mental health disorders of unemployed NEET by 5%. This result suggests that policies targeting unemployed NEET should address education first and develop a vocational intervention. School-integrated learning programs designed with these outcomes in mind can develop youths' social and emotional well-being (Schmidt et al., 2020). Additionally, the positive coefficient for age suggests a linear increase in the probability of having mental health disorders with each unit increase in age, while the negative coefficient for the age square indicates a concave relationship, with the probability of mental health disorders increasing at a decreasing rate. These findings imply that as individuals in the 15–29 age range grow older, their susceptibility to mental health disorders tends to increase, albeit at a diminishing rate. Considering these age-related implications, policymakers may contemplate age-specific interventions to address mental health concerns among NEET individuals. Tailored programs, support systems, and mental health initiatives designed for different age brackets within the 15–29 range could be explored based on the nuances revealed by the model results.

Finally, our results show that household wealth index and parental education level are significantly and negatively related to the probability of being NEET; however, these variables do not significantly affect the probability of having mental health disorders among NEETs. These results are mostly in line with the current literature on youth education (Caruana et al., 2019; Cottini & Ghinetti, 2017; O'Dea et al., 2014) and parental education (Bania et al., 2019; Rodwell et al., 2018). These results indicate that mental health disorders are mainly related to individual characteristics rather than family characteristics. Since parental education does not significantly influence mental health outcomes in this subgroup, resources may be better directed toward other factors that do have a significant impact. In practical terms, the findings for Sample 2, the positive association between NEET status and mental health disorders, highlight the importance of addressing the unique challenges faced by unemployed individuals who are not in education. Practical implications include the need for targeted mental health interventions and support programs for this subgroup of youth. For this subgroup, the positive association between NEET status and mental health

Table 4: The probability of Having Mental Health Disorders (Ages 15–29) (Probit Model Results)

	Sample 1			**Sample 2**			**Sample 3**		
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	-0.06	-0.052	-0.043	0.037***	0.07	0.066	0.034	0.019	0.016
	(0.072)	(0.072)	(0.075)	(0.007)	(0.047)	(0.052)	(0.039)	(0.039)	(0.038)
Age squared/100	0.12	0.104	0.086	-0.065***	-0.142	-0.137	-0.061	-0.032	-0.028
	(0.141)	(0.141)	(0.147)	(0.014)	(0.101)	(0.108)	(0.081)	(0.082)	(0.079)
Male (ref. female)	0.171***	0.171***	0.165**	-0.003	-0.103	-0.113	0.291***	0.202***	0.198***
	(0.047)	(0.058)	(0.067)	(0.005)	(0.072)	(0.074)	(0.056)	(0.05)	(0.046)
Married (ref. single)	-0.120***	-0.105***	-0.104***	-0.016***	0.024	0.023	-0.108***	-0.071*	-0.075**
	(0.021)	(0.03)	(0.033)	(0.006)	(0.044)	(0.047)	(0.038)	(0.036)	(0.035)
Education level (ref. primary or below)									
Middle school	0.057**	0.054**	0.053*	-0.012	-0.059	-0.063	0.039	0.039	0.04
	(0.024)	(0.027)	(0.02)	(0.008)	(0.06)	(0.062)	(0.024)	(0.028)	(0.027)
High school and above	0.154**	0.135**	0.127*	-0.054***	-0.148***	-0.146**	0.061	0.054	0.054
	(0.077)	(0.069)	(0.074)	(0.009)	(0.055)	(0.059)	(0.041)	(0.036)	(0.034)
Wealth index (ref. bottom 20%)									
Second 20%		-0.008	-0.01		0.005	0.006		-0.025	-0.025
		(0.028)	(0.028)		(0.042)	(0.044)		(0.029)	(0.028)
Third 20%		0.042	-0.041		0.002	0.006		0.019	0.022
		(0.032)	(0.033)		(0.049)	(0.052)		(0.033)	(0.032)
Fourth 20%		0.051	-0.045		0.007	0.01		-0.017	-0.015
		(0.05)	(0.051)		(0.052)	(0.055)		(0.036)	(0.035)
Top 20%		0.051	0.0461		-0.053	-0.051		-0.049	-0.035
		(0.077)	(0.076)		(0.063)	(0.068)		(0.047)	(0.046)
Parent's education (ref. primary or below)									
Middle school			-0.131			-0.044			-1.56
			(0.096)			(0.078)			(148.614)
High school or above			0.018			-0.002			0.033
			(0.056)			(0.066)			(0.082)
Rho	-0.782	-0.696	-0.637	1.696*	0.081	0.034	-0.342**	-0.273**	-0.299**
	(0.532)	(0.494)	(0.472)	(0.899)	(0.294)	(0.291)	(0.15)	(0.115)	(0.12)
# of Observation	13,319	9,288	9,288	7,413	4,201	4,201	9,258	5,568	5,568

Notes: Marginal Effects are reported, and the clustered robust standard errors are given in the parenthesis. ***, **, and * indicate the marginal effects is significant at 1%, 5%, and 10%, respectively. The marginal effects for the THS dummies (2014, 2016, and 2019 dummies) and region dummies (12 NUTS-1 regions of the country) are not shown in the table. Sample 1 consists of all young individuals aged between 15-29, Sample 2 comprises non-NEET, and the NEET who are unemployed and not enrolled in education, and, finally, Sample 3 comprises non-NEET and NEET who are inactive and not enrolled in education.

disorders emphasize the need for tailored policies and interventions aimed at improving their mental health and employability: mental health support programs, employment readiness programs, job placement services, mentoring, and peer support networks. Implementing initiatives that specifically address the mental health needs of unemployed NEETs could have a significant positive impact on their overall well-being. Furthermore, focusing on improving the employability of this group can potentially reduce their likelihood of experiencing mental health disorders.

6 Conclusion

This study investigates the association between mental health disorders and NEET status in Turkey to provide scientific evidence that can inform policy and practice in other Southern European, developing, or Muslim countries with similar socioeconomic levels.

The selection equation results show that the probability of being NEET is higher for older, female, and married youths. A youth's likelihood of being a NEET is negatively affected by both their parents' and their own attained level of education. Young individuals are more likely to be NEET if they come from households with lower wealth indices. The correlation coefficient obtained from the bivariate probit model with selection estimation indicates that the obligations or incapacities that cause young individuals in Turkey to be unemployed also cause those individuals to experience mental health disorders since the probabilities of being an unemployed NEET and having mental health disorders are positively correlated in error terms. Probit model results show that unemployed NEETs with higher education levels are less likely to experience mental health disorders. Wealth status is not a significant driver for mental health disorders. The main findings are mostly in line with the existing literature (e.g., Plenty et al., 2000; Kvieskienė et al., 2021; Karaoğlan et al., 2022; Minh et al., 2023).

In general, our research concludes that young individuals' NEET status and mental health disorders are significantly explained by the socioeconomic status of both the young individuals and their parents. Specifically, we can categorize the young individuals with lower levels of education and those whose parents have lower levels of education as disadvantaged *vis-à-vis* NEET status. Conversely, higher levels of education have a negative and significant impact on the probability of mental health disorders for unemployed NEETs. Therefore, we can claim that creating educational opportunities is essential to facilitate the direct transition from school to the labor market. In addition, implementing a range of mental and social skill support programs, such as mental health services for education systems and youth career support initiatives, will increase the self-confidence and job readiness of younger age cohorts.

Given the strong association between NEET status and mental health disorders, several policies and interventions should be considered to prevent young people from becoming NEET and to reintegrate them into society. Policymakers can apply early interventions to facilitate the social inclusion of these groups into society, along with more holistic approaches to addressing youth needs. Additional steps to support young people could include improving the educational curriculum in line with the skills demanded by employers, incorporating mental health services into youth career support enterprises, and offering emotional and practical assistance during the time spent in NEET status. Given the positive association between being unemployed NEET and having mental health disorders, it is very important

to reduce the number of unemployed young people and the duration of unemployment. In this context, the existence of employment agencies that register unemployed young people, help them to find a job, and provide the necessary training to these unemployed young people during their unemployment period according to the specific needs of the sectors seems to be very important.

Utilizing a large representative sample and applying bivariate probit models with selection to address both endogeneity problems and unobserved heterogeneity, as well as selection bias, are important strengths of this study that should be considered when interpreting its results. The lack of a panel dataset, which prohibits us from observing the duration of an individual's NEET status, is the main limitation of this study. In addition, we could not observe whether young NEETs participated in training programs, which could create bias when interpreting our results.

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