Original Research

# PREVALENCE OF ANXIETY SYMPTOMS AND ASSOCIATED FACTORS AMONG ADULTS IN NORTHWEST SYRIA

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**ABSTRACT**

**Introduction:** In Northwest Syria, an area plagued by persistent conflict and instability, our understanding of the prevalence of anxiety remains limited. The aim of this study is to assess the occurrence of anxiety symptoms among adults living in Northwest Syria. **Methods:** This study was conducted with a cross-sectional approach, this research delves into the adult population residing in designated sub-districts of Northwest Syria, with a special emphasis on the Idlib district, covering both Idlib city and Atmeh camps. Targeting individuals aged 18 years and older, the study employed a random walk and spin-the-pen technique sampling method to recruit participants from study locations. The data was collected using a questionnaire via face-to-face interviews. **Results:** A total of 890 adults participated in the study. The findings revealed that 75% of participants exhibited symptoms of anxiety. Moreover, prolonged mobile phone usage, exceeding 4 hours daily, exhibited a correlation with heightened anxiety symptoms prevalence. Notably, geographical location acted as a modifier in the relationship between anxiety symptoms and mobile phone usage. Specifically, individuals in Idlib City demonstrated increased odds of anxiety symptoms with excessive phone usage. **Conclusion:** The study found that anxiety symptoms significantly increased with excessive mobile phone use, varying by location, gender, and income level. Women and those with lower incomes were particularly affected. Additionally, external factors like a recent earthquake and ongoing political unrest also contributed to higher anxiety levels in the region.

**Keywords:** Anxiety, Symptoms, Northwest Syria, conflict region, Associate factors**,** Syrian adults

**Introduction:**

According to the Institute of Health Metrics and Evaluation, 970 million people (1 of every 8 people) around the world were suffering from a mental disorder in 2019, and the most common disorders were depression and anxiety(WHO, 2022). About 4% of people worldwide are suffering from an anxiety disorder. A total 301 million individuals worldwide suffered from an anxiety disorder in 2019(WHO, 2023). In 2019, 9.5% of adults encountered mild anxiety symptoms, 3.4% faced moderate symptoms, and 2.7% dealt with severe symptoms over the past two weeks. Conversely, 84.4% reported either no symptoms or only minimal ones in the USA (Terlizzi EP and Villarroel MA, 2020). The WHO has defined anxiety disorder as heightened levels of fear and apprehension, accompanied by corresponding disruptions in behavior. The symptoms are sufficiently intense to lead to notable emotional distress or substantial limitations in daily functioning (WHO, 2022). Anxiety disorders take time to manifest, it can start in childhood, although it usually do so around the age of thirty (Institute of Mental Health, 2022). Anxiety does not go away in those who have it, and it may even get worse with time (Penninx et al., 2021). Only 25% of patients with anxiety disorders receive therapy, despite the fact that there are extremely effective medications for these conditions, according to the WHO (Alonso et al., 2018).

People exposed to poor life conditions - including poverty, violence, disability, and inequality - are most at risk. This is why, after 14 years of war, Syria has become a very vulnerable country (IMC, 2014). People who are exposed to conflict are far more likely to suffer from mental health problems. The majority of the material that has been written about mental health disorders during times of war and displacement focuses on major depressive disorder (MDD), general anxiety disorder (GAD), and posttraumatic stress disorder (PTSD) (Steel Z, 2009). According to a 2009 meta-analysis, the prevalence of depression and PTSD ranged from 3% to 85.5% for MDD and from 0% to 99% for PTSD in populations affected by violence (Steel Z, 2009). Since millions of Syrian refugees have been dispersed around the world, there will likely be a significant variation in the ways that mental health issues manifest. A systemic review study in 2020 reveals that most of the research on mental health in Syrians has been conducted in Türkiye, followed by Jordan then Lebanon. More than half of those studies were carried out in refugee camps despite most Syrian refugees living in buildings set in urban areas In Syria, there is an obvious lack of studies and research about MHPSS which is indicative of the severe instability there and emphasizes the need for more studies on mental health (Hendrickx et al., 2020). High anxiety has been reported among Iraqi refugees in a cross-sectional study, which revealed the prevalence of anxiety was 60.8% (Al-Smadi et al., 2017).

The situation is similar in Türkiye as well. A cross-sectional study conducted in Istanbul showed that symptoms of mental disorders are widespread among Syrian refugees in Türkiye (Acarturk et al., 2021). One study confirmed that the prevalence of post-traumatic stress and other mental disorders including anxiety among Syrian refugees could be over ten times more likely to develop mental disorders than the general population in the same areas (Peconga & Høgh Thøgersen, 2020). Even in Western countries, although they have high incomes and refugees enjoy prosperity compared to neighboring

countries, the prevalence rates of common mental disorders among resettled Syrian refugees are much higher than the rates reported in the general population (Nguyen et al., 2022).

In the United States, the prevalence of possible diagnoses was high for anxiety (40.3%) among newly arrived Syrian refugees (Javanbakht et al., 2019). The persistently high values of psychological stress confirm the importance of therapeutic interventions for Syrian refugees (Borho et al., 2020). Inside Syria, according to USAID, OCHA Reports, and Multi-Sectoral Need assessment, It is estimated that 16.7 million people require humanitarian aid, and 60% of households purchase food with loans. More than half of Syrians, or over 12 million people, are hungry. Of those over two in northern Syria, 52% have a disability (i.e., struggle to do daily duties). The state of the economy and society is getting worse, and 4.1 million out of 4.5 million live in North Syria are in dire need of humanitarian assistance (OCHA, 2023). Based on the Multi-Sector Needs Assessment (MSNA) Syria 2024 conducted by the International Rescue Committee (IRC), the results were the following; 1) while 17% of men reported having psychosocial disorders in northwest Syria, a higher number of women (25%) reported having psychosocial distress, 2) The mental disorders have high prevalence rate in displaced people compared with household people, 3) According to the research, 68% of respondents in northwest Syria said they had access to mental health services and 20% of people with mental health illness or distress utilized psychiatric drugs. (IRC, 2024). War profoundly impacts the healthcare sector, notably affecting access to medical services. The onset of conflict in Syria saw a severe decline in healthcare access for its people. While international aid has gradually improved the situation, there's still a considerable gap between current access levels and desired standards, indicating a pressing need for further enhancement.

More than half of Syria's population has been forced displaced since the beginning of the Syrian conflict in March 2011, this displacement has resulted in 6 million individuals being internally displaced, while 5 million Syrians have sought refuge in neighboring countries, and nearly 1 million have pursued asylum in Europe. Additionally, many people in Syria have not been displaced but still require humanitarian aid. The ongoing Syrian conflict has exposed the population to significant risk factors associated with poor mental well-being, including exposure to traumatic incidents, coerced displacement, and persistent stressors like unemployment, impoverishment, social upheaval, and the erosion of social support networks (OCHA, 2023).

There are few studies conducted in Syria to assess and highlight the mental issues in spite of the mental health is crucially affected by the war, poverty, displacement, and recently the earthquake. The aim of this study is to assess the occurrence of anxiety symptoms and associated factors among adults living in Northwest Syria, particularly in the context of the ongoing conflict and displacement. The study assessed the impact of excessive mobile phone usage as a potential risk factor for anxiety. Additionally, the research seeks to identify potential confounders and effect modifiers in this relationship.

**Methods:**

In this study, we employed a cross-sectional research design to investigate the prevalence of anxiety symptoms among adults residing in Northwest Syria, an area characterized by conflict and displacement. The study population comprised adults living in meticulously identified sub-districts within this conflict-affected region. To ensure the study's robustness, a rigorous sample size calculation was performed, setting a confidence level of 95%, a margin of error of 5%, and an anticipated population proportion derived from a similar study on Iraqi refugees in Jordan, where the prevalence of anxiety disorders was found to be 60%. According to calculations using a formula by Lwanga (1991), the minimum required sample size was 370. The sample selection process employed simple random sampling techniques within two key locations: Atmeh Camps and Idlib City, both situated in Northwest Syria. Within these communities, interviewees were randomly chosen to participate, further enhancing the study's credibility.

Sampling technique: we chose Atmeh because it is rural and most of the population there are displaced and live in camps whereas Idlib is a city and there are many household people there and many displaced people live there. Idlib is the biggest city in North West Syria. The survey teams start from a central point within the cluster, a random initial direction is determined by the spin of a pen. The households located along the line extending from the center to the cluster's edge are tallied, and one is randomly selected. Following this, the "next nearest" household selection method is employed to identify additional households sequentially until the required number of samples is obtained. We enrolled all adults aged 18 and above residing in the study area who were willing to participate in the study.

Our research centered on two main sub-districts: Idlib City and Harem-Atmeh Camps, both within the broader Northwest Syria region. The data collection process was conducted using a semi-structured questionnaire, comprising two essential components. The first component involved the General Anxiety Disorder-7 (GAD7) Scale(Yousuf et al., 2022), consisting of ten thoughtfully designed questions assessing respondents' feelings and emotions over the preceding two weeks. Each question offered four possible answers, with a scoring system ranging from 0 to 3. A cutoff score of 15 or higher indicated the presence of significant anxiety symptoms. The second part of the questionnaire focused on sociodemographic information, covering essential factors such as age, gender, marital status, family size, displacement status, education level, employment status, economic well-being, the presence of chronic diseases, and daily mobile phone usage in hours. To ensure the success of the data collection process, ten trained community health workers conducted face-to-face interviews with the study participants. These surveys took place within the comfort of the participants' homes and were facilitated using KOBO Android applications on tablets, streamlining data collection, and ensuring efficiency. The data was collected period extended over two months (January and February 2024), providing ample time to collect valuable information from the study population. It's worth noting that our inclusion criteria encompassed all adults aged 18 and above who willingly consented to participate in our research, while those under 18 and those who chose not to participate were excluded.

The study variables included key independent factors such as age, gender, marital status, family size, displacement status, education level, employment status, economic well-being, presence of chronic diseases, and daily mobile phone usage. The dependent variable under scrutiny was the GAD Score, which reflected participants' anxiety levels. Once data was collected, the analysis phase commenced, involving using SPSS v.26 and Excel 2016 for data processing. The survey data was efficiently managed using the Android KOBO application.

The study received approval from the Ethics Committee for Social and Human Sciences at Ankara Yildirim Beyazit University (Approval No: 2023/184) and obtained permission from the local authority (Permission No: 23/245). Before participating, all participants were briefed about the study, and each participant provided their consent by signing a consent form.

Data was anodized using SPSS 26. A comprehensive evaluation of 890 observations and 10 variables was conducted. Variables were transformed into binary categories to address sparsity. Associations between variables and anxiety symptoms were assessed using chi-squared tests, leading to the identification of main confounders (employment status, income status, sex, and location) and variables associated solely with the outcome or exposure. Logistic regression analysis was performed to adjust for confounders and assess the relationship between anxiety symptoms and mobile phone usage.

**Results:**

The study included almost equal numbers of male (49%) and female (51%) participants. Over half of the participants (58%) were under 40 years old, and the majority (79%) were married. A significant portion (56%) had a secondary education or lower. Nearly half of the participants (less than 50%) had more than four children. A majority of the parents (81%) reported having a disability, and 83% were unemployed. Only 29% of the participants reported a higher income. Most were from İdlib. The majority (78%) had non-communicable diseases (NCDs), and more than half (54%) reported daily mobile phone usage ( table 1).

**Table 1: Sociodemographic characteristics of participants (n=890)**

| **Variable** | **Categories** | **Frequency** | **Percentage (%)** |
|---|---|---|---|
| Sex | Male | 436 | 49 |
| | Female | 454 | 51 |
| Age group | <40 years | 520 | 58 |
| | >= 40 years | 370 | 42 |
| Marital status | Single | 189 | 21 |
| | Married | 701 | 79 |
| Education level | Secondary or less | 502 | 56 |
| | High school or more | 388 | 44 |
| Children number | 0 to 3 | 487 | 54 |
| | 4 or more | 403 | 46 |

| | | | |
|---|---|---|---|
| Disability | Yes | 719 | 81 |
| | No | 171 | 19 |
| Employment | Yes | 744 | 83 |
| | No | 146 | 17 |
| Income status | Income less than expenses | 638 | 71 |
| | Income equals or more than expenses | 252 | 29 |
| Location | Idlib | 627 | 70 |
| | Atmeh region | 263 | 30 |
| NCD status | Yes | 702 | 78 |
| | No | 188 | 22 |
| Mobile phone usage | 0 to 4 hours | 414 | 46 |
| | 5 hours or more | 476 | 54 |

The characteristics of 890 participants and their association with anxiety symptoms are summarized in Table 2. In this univariable analysis the crude odds ratio of anxiety symptoms in participants use their phones more than 4 hours daily compared to participants use their phones 0 to 4 hours daily is 1.46, CI95% (1.07-1.99), P-value = 0.0150. Other characteristics that have a crude association with anxiety symptoms that indicate them as risk factors for anxiety symptoms are location, sex, and income status. Data has 674 (75.73%) observations with anxiety symptoms and 476 (53.48%) of the participants use their phones more than 4 hours daily (table 2)

**Table 2: The sociodemographic characteristics of participants and association with anxiety symptoms**

| **Variable** | **Categories** | **Total** | **Frequency and Percentage of anxiety symptoms n (%)** | **P-value**** |
|---|---|---|---|---|
| Mobile phone usage | 0 to 4 hours | 414 | 298 (71.98) | 0.0150 |
| | 5 hours or more | 476 | 376 (78.99) | |
| Age group | <40 years | 520 | 393 (75.58) | 0.8993 |
| | >= 40 years | 370 | 281 (75.95) | |
| Children number | 0 to 3 | 487 | 360 (73.92) | 0.1668 |
| | 4 or more | 403 | 314 (77.92) | |
| Disability | Yes | 719 | 541 (75.24) | 0.4874 |
| | No | 171 | 133 (77.78) | |
| Employment | Yes | 744 | 574 (77.15) | 0.0258 |
| | No | 146 | 100 (68.49) | |
| Education level | Secondary or less | 502 | 382 (76.10) | 0.7726 |
| | High school or more | 388 | 92 (75.26) | |

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|---|---|---|---|---|
| Income status | Income less than expenses<br>Income equals or more than expenses | 638<br>252 | 511 (80.09)<br>163 (64.68) | 0.001 |
| Location | Idlib<br>Atmeh region | 627<br>263 | 463 (73.84)<br>211 (80.23) | 0.0428 |
| Marital status | Not married<br>Married | 189<br>701 | 148 (78.31)<br>526 (75.04) | 0.3521 |
| NCD status | Yes<br>No | 702<br>188 | 534 (76.07)<br>140 (74.47) | 0.6496 |
| Sex | Male<br>Female | 436<br>454 | 310 (71.10)<br>364 (80.18) | 0.0016 |

Each variable was tested for its potential confounding of the association between anxiety symptoms and mobile usage and tested for its potential effect modification. Table 3 shows the OR for the association between anxiety symptoms and mobile usage; adjusted for other variables with potential confounders that are associated with both anxiety symptoms and mobile usage (employment, income status, location, and sex) and chosen priori confounders (age) and other variable that associated with anxiety symptoms only. Table 3 shows that we have a mild confounding effect for sex and employment status with stronger confounding for income status. The location has effect modification for the association between anxiety symptoms and mobile phone usage with p-value for interaction (0.0029) where the OR for association anxiety symptoms and mobile phone usage in the stratum of Idlib city location 1.99 (1.38-2.87) p value= 0.0002 and for the stratum of Atmeh camps location 0.69 (0.37-1.27) with p-value =0.2295. (see table 3)

**Table 3: Odds Ratios for the association between mobile phone usage and participant's sociodemographic characteristics, their residence and NCD status.**

| **Variable** | **Adjusted for** | **Adjusted OR (95%CI)** | **P-value*** |
|---|---|---|---|
| Mobile phone usage | Unadjusted | 1.46 (1.07-1.99) | |
| Mobile phone usage | Age group | 1.50 (1.09-2.06) | 0.7875* |
| Mobile phone usage | Children number | 1.52 (1.11-2.07) | 0.7999* |
| Mobile phone usage | Disability | 1.51 (1.10-2.06) | 0.6889* |
| Mobile phone usage | Employment | 1.54 (1.13-2.11) | 0.4657* |
| Mobile phone usage | Education level | 1.49 (1.09-2.04) | 0.0652* |
| Mobile phone usage | Income status | 1.61 (1.17-2.21) | 0.1648** |
| Mobile phone usage | Location<br>By strata:<br>Idlib<br>Atmeh | 1.50 (1.11-2.04)<br><br>1.99 (1.38-2.87)<br>0.69 (0.37-1.27) | 0.0029*<br><br>0.0002**<br>0.2295** |
| Mobile phone usage | Marital status | 1.45 (1.06-1.98) | 0.5559* |
| Mobile phone usage | NCD status | 1.48 (1.07-2.04) | 0.33* |

| | | | |
|---|---|---|---|
| Mobile phone usage | Sex | 1.52 (1.12-2.08) | 0.2541* |

* P-values for test of homogeneity of odds ratios

**P-values for effect within stratum

Logistic regression analysis is done for anxiety symptoms and mobile phone usage with a crude Odds ratio of 1.46 CI95% (1.07-1.99) and the mobile usage variable tested for fitting the model with p-value for Likelihood-ratio test (p=0.0150). priori confounders added to the model (age and sex) and then variables added to the model according to their ORs difference effect by stepwise approach and location then tested for its effect modification with Likelihood-ratio test for the interaction to fit the model (p=0.0015). Other variables were added to the model without showing important changes to the OR of anxiety symptoms with excessive mobile phone usage, so they were excluded for this reason and to avoid sparsity.

The results of the logistic regression test show that location has an effect modification on the association between anxiety symptoms and mobile usage. In the stratum of Idlib city location the OR =2.45 (1.66-3.60) and (p<0.001) for anxiety symptoms in excessive mobile usage compared to less mobile usage (threshold of 4 hours usage). Whereas in the Atmeh camp location stratum the OR =1.92 (1.14-3.21) with (p =0.013). For other variables, the model shows that location has OR =2.53 (1.51-4.25) P<0.001. For sex OR = 1.75 (1.27-2.43) with P value= 0.001. For income status OR = 0.44 (0.31-0.61) with P value <0.001 (see table 4)

**Table 4: Model for factors associated with anxiety symptoms**

| **Variable** | **Categories** | **Adjusted OR (95%CI)** | **P-value** |
|---|---|---|---|
| Mobile phone usage (with location of Idlib city) | 0 to 4 hours<br>5 hours or more | 1<br>2.45 (1.66-3.60) | -<br>0.001 |
| Mobile phone usage (with location of Atmeh camps) | 0 to 4 hours<br>5 hours or more | 1<br>1.92 (1.14-3.21) | -<br>0.013 |
| Location (for Mobile phone usage from 0 to 4 hours) | Idlib city<br>Atmeh camps | 1<br>2.53 (1.51-4.25) | -<br>0.001 |
| Age group | <40 years<br>>= 40 years | 1<br>1.20 (0.86-1.68) | -<br>0.290 |
| Sex | Male<br>Female | 1<br>1.75 (1.27-2.43) | -<br>0.001 |
| Income status | Less than expense | 1<br>0.44 (0.31-0.61) | -<br>0.001 |

| | | | |
|---|---|---|---|
| | Equals or more than expenses | | |

**Discussion:**

The discussion of the study's findings involves a comprehensive analysis of various aspects, including the observed associations, the prevalence of anxiety symptoms, and the implications of excessive mobile phone usage in Northwest Syria. It also relates these findings to existing research in the field. First and foremost, the prevalence of anxiety symptoms in the study population was found to be 75%, which is considerably higher than in some previous studies. For instance, a study in Jarablus reported a prevalence of 50%(Tekeli-Yesil et al., 2018), while a systematic review of mental disorders in Syria found a general anxiety disorder (GAD) prevalence of 55%(Hendrickx et al., 2020). According to a research conducted by the International Medical Corps (IMC), which assesses the mental health status of Syrians living in Syria, Türkiye, Lebanon, and Jordan, the prevalence of severe emotional disorders was 61%, 23%, 59%, and 74%, respectively. Similar conclusions are seen in research on Syrian refugees (European Commission, 2016)

A cross-sectional study was conducted among medical students in Syria to evaluate the impact of anxiety and depression on the National Medical Unified Examination (NMUE) takers, the study showed that two-thirds of NMUE takers inside Syria suffered from anxiety or depression, which affect their academic performance.(Jamil et al., 2022). In addition, those finding were much higher than global percentage and even in neighbor countries. Globally, the prevalence of anxiety is estimated about 4.05% (Javaid et al., 2023)and we see higher rate in Arabic countries like 11% in Lebanon (Karam et al., 2006)and 12% in Saudi Arabia(Altwaijri et al., 2020). This higher prevalence in the current study may be attributed to the specific timing of data collection, which occurred shortly after a significant earthquake that struck the region in February 2023. The earthquake and the ongoing political instability in Northwest Syria could have contributed to heightened anxiety levels in the population. We found the same findings in previous studies (Tekeli-Yesil et al., 2018) (Hendrickx et al., 2020) that high anxiety rate was correlated with female, low-income, and displaced populations. The study found a significant association between excessive mobile phone usage and anxiety in Northwest Syria. This association remained robust even after adjusting for potential confounders, including employment status, income status, sex, and location. We can see that most of the participants were from the poor level and that reflected the realistic percentage of the population, which was more than 60% in the USAID Report(OCHA, 2023) The odds of experiencing anxiety were notably higher among individuals who reported using their mobile phones for more than 4 hours per day compared to those with less usage. This is a concerning finding and emphasizes the potential impact of mobile phone usage on mental health, especially in a region like Northwest Syria, where people are already exposed to multiple stressors due to ongoing conflict and instability. These findings are consistent with the broader body of research indicating a link between mobile phone usage and mental health issues. Excessive use of mobile phones, particularly for social media and internet browsing, has been associated with increased stress, anxiety, and depression in various studies conducted worldwide. The constant exposure to

distressing news and social media content, along with the addictive nature of mobile phones, may exacerbate anxiety symptoms. Moreover, the study highlights the importance of location as an effect modifier. The relationship between anxiety symptoms and mobile phone usage varied between different locations within Northwest Syria. This could be attributed to variations in access to mental health services, the availability of social support, and the specific stressors experienced by individuals in different areas. Understanding these regional differences is crucial for tailoring interventions effectively.

However, there were some limitations to consider. Like many cross-sectional studies, establishing a causal association was not feasible. Additionally, the study was conducted in only two cities, potentially limiting the generalizability of findings to all adults in Northwest Syria. On the positive side, the study's strength lies in its utilization of face-to-face interviews conducted directly in households and camps where participants resided.

**Conclusion:**

The study identified a notable rise in anxiety symptoms, with a prevalence of 75%, particularly linked to excessive mobile phone use, geographic location, gender, and income level. Women and individuals with lower incomes were notably more susceptible, with noticeable differences observed across different locations. The findings underscore that factors highlighted in the study, coupled with external influences like recent earthquakes and ongoing political unrest, collectively contribute to increased vulnerability to anxiety among individuals in this region.

Authorities and international organizations such as the WHO should enhance public awareness campaigns aimed at educating the population about potential mental health issues. Additionally, they should create community support programs that offer psychosocial support and stress management resources tailored to the specific needs of various locations in Northwest

**Conflicts of Interest**

The authors declare no conflicts of interest.

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