# The relationship between anxiety symptoms and somatic disorders in young people aged 15-21 years

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## Abstract

Background: Mental health issues remain a significant concern in our society, ranging from mild to severe conditions. This study aims to document anxiety and somatic symptoms as two disorders that manifest to varying degrees in individuals, with the primary objective of exploring the relationship between these symptoms.
Objective: This study aims to explore the relationship between anxiety symptoms and somatic disorders in young people aged 15-21.
Methods: A cross-sectional quantitative study design was employed. The sample consisted of 150 respondents divided into two educational levels: high school and university students. Stratified random sampling was used to ensure proportional representation of the target population. Participants were recruited via email invitations. Data were collected through standardized instruments measuring anxiety and somatic symptoms. Statistical analysis was performed using SPSS Statistics version 27.0.
Results: The sample included 73 girls (48.7%) and 77 boys (51.3%), with an average age of 17.13 years (SD = 2.18). Educational distribution comprised 42 participants (28.0%) in 10th grade, 43 (28.7%) in 11th grade, 1 (0.7%) in 12th grade, 53 (35.3%) in first-year undergraduate studies, 1 (0.7%) in second year, and 10 (6.7%) in third year. Of the 147 participants reporting residence, 49 (33.1%) lived in urban areas, while 98 (66.2%) resided in rural areas. The average anxiety score was 0.76 (SD = 0.6) and the average somatic symptom score was 0.57 (SD = 0.35). A significant positive correlation was found between anxiety and somatic symptoms ($r = 0.725$, $p = 0.000$).

**Key words**: Somatic disorder, anxiety disorder, age, education level, gender, mental health.

## 1. Introduction

Adolescence is a critical developmental stage marked by significant physical, emotional, and social changes (Smith et al., 2019; Steinberg, 2014). While it is commonly defined as spanning ages 10-19, the present study focuses on individuals aged 15-21 years, a period that partially overlaps with what the literature defines as *emerging adulthood* (18-29 years). This transitional phase is characterized by continued identity formation, increasing independence, and exposure to new social and academic demands. Including individuals from both late adolescence and early emerging adulthood allows for a more comprehensive understanding of mental health vulnerabilities within a population that is still engaged in educational settings (schools and universities), thus representing a unique and relevant sample.

During this developmental period, mental health concerns – particularly anxiety disorders – are highly prevalent and often manifest alongside somatic symptoms such as headaches, abdominal pain, and fatigue (Jones & Brown, 2021; World Health Organization, 2022; Costello et al., 2003). Anxiety disorders are among the most common psychiatric conditions affecting young people, with global prevalence estimates ranging from 10% to 20% (Kessler et al., 2007; Polanczyk et al., 2015; Baxter et al., 2014). These disorders frequently co-occur with somatic complaints, creating complex clinical presentations that may challenge accurate diagnosis and effective treatment (Gerritsen et al., 2018; Hiller et al., 2006). In many cases, somatic symptoms may overshadow underlying psychological distress, potentially delaying appropriate mental health interventions (Beesdo-Baum & Knappe, 2012; Rief & Broadbent, 2007; Campo, 2012).

The relationship between anxiety and somatic symptoms is widely recognized as bidirectional, with each condition potentially exacerbating the other (Van der Feltz-Cornelis et al., 2010; Henningsen et al., 2003).

Neurobiological evidence suggests that dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis may underlie this interaction (Chrousos, 2009; McEwen, 2004; Gunnar & Quevedo, 2007). From a psychological perspective, cognitive-behavioral theories propose that individuals with elevated anxiety may demonstrate increased somatic vigilance, leading to heightened perception and misinterpretation of physical symptoms (Barsky et al., 1995; Hadwin et al., 2006; Rachman, 1998). Additionally, environmental and social stressors – including academic

pressure, peer relationships, and family dynamics – play a significant role in shaping both anxiety and somatic experiences (Compas et al., 2017; Samaan, 2000; Repetti et al., 2002). Cultural factors further influence how symptoms are perceived, expressed, and reported, highlighting the importance of context-specific research (Kirmayer & Young, 1998; Kleinman, 1986; Hinton et al., 2008).

In Kosova, research examining the relationship between anxiety and somatic symptoms remains limited. As a developing context with ongoing challenges in mental health infrastructure, Kosova faces difficulties in recognizing and strengthening the role of psychological services. The field of psychology is still relatively undervalued, and there is a lack of locally grounded empirical studies addressing the interplay between mental and physical health among young people. This gap underscores the importance of conducting research within this specific socio-cultural context, as findings from other countries may not be fully generalizable. Understanding how anxiety and somatic symptoms manifest among youth in Kosova is essential for informing culturally appropriate prevention strategies and interventions.

Untreated anxiety and somatic disorders during adolescence and emerging adulthood may have long-term consequences, including impaired academic performance, reduced occupational functioning, and lower quality of life (Woodward & Fergusson, 2001; Copeland et al., 2014; Fergusson et al., 2007). Early identification and intervention are therefore crucial, emphasizing the need for integrated approaches that address both psychological and physical health (Katon et al., 2007; Bower et al., 2011; O'Connell et al., 2009). Despite the growing body of literature, important gaps remain regarding the mechanisms underlying this relationship and the most effective strategies for intervention (Froehlich et al., 2018; Haller et al., 2021; Craske et al., 2009).

## Aim, objectives, and hypotheses of the study

The main aim of this study is to examine the relationship between anxiety symptoms and somatic symptoms among young people aged 15-21 years in Kosova. Specifically, the study seeks to: (1) determine whether a significant relationship exists between anxiety and somatic symptoms; (2) assess the prevalence of anxiety within the sample; and (3) analyze gender differences in both anxiety levels and somatic complaints.

Based on the existing literature, the study proposes the following hypotheses: (H1) there is a positive correlation between anxiety levels and

somatic symptoms, and (H2) there are gender differences in the levels of anxiety and somatic symptoms.

## 2. Methods

### 2.1. Study Design and Setting

This study employed a quantitative, cross-sectional design conducted during the 2022-2023 academic year in Pristina and Mitrovica, Kosova. The primary objective was to examine the prevalence of anxiety and its relationship with somatic symptoms among high school and university students, as well as to analyze gender differences.

A stratified random sampling technique was used to ensure proportional representation across two educational strata: high school (grades 10-12) and undergraduate university students. Participants were randomly selected from compiled lists provided by the participating institutions. Data were collected face-to-face during non-disruptive periods (homeroom or after class).

Permissions were obtained from the Ministry of Education, Science and Technology of Kosovo, as the main authority, and additionally from the heads of the participating high schools and universities. This ensured formal approval and collaboration for data collection.

Potential sources of bias were addressed by using stratified random sampling, clearly defined eligibility criteria, standardized and validated instruments, and ensuring participant anonymity and confidentiality. The study included 150 participants, which was sufficient for this pilot study and provided a basis for future larger-scale research in Kosovo.

**Eligibility criteria** are summarized in Table 1.

*Table 1*

| Criterion | Description |
|---|---|
| Age | 15-21 years |
| Education | High school (grades 10-12) or undergraduate university |
| Location | Kosova (urban and rural) |
| Consent | Written informed consent from participants; parental consent for participants under 18 |

## 2.2. Instruments and Measures

Three standardized and validated instruments were used:

1. **Beck Anxiety Inventory (BAI)** – 21-item self-report measuring anxiety levels.
2. **Level 2 – Somatic Symptom – Adult questionnaire** (PHQ-15 adaptation) – 15-item checklist for somatic symptoms.
3. **Level 2 – Somatic Symptom – Child (Ages 11-17**) – 15-item checklist for adolescents.

The instruments were **culturally adapted and validated** for use in Kosova through expert review, back-translation, and pilot testing.

## 2.3. Reliability of the instruments

**Anxiety Scale**

| Reliability Statistics | |
|---|---|
| Cronbach's Alpha | N of Items |
| .925 | 20 |

The reliability of the scale used in the analysis was assessed using Cronbach's Alpha. The Cronbach's Alpha coefficient obtained was 0.925, indicating a high level of internal consistency reliability. The scale consisted of 20 items in total

**Somatic symptoms scale**

| Reliability Statistics | |
|---|---|
| Cronbach's Alpha | N of Items |
| .798 | 15 |

The reliability of the scale used in the analysis was assessed using Cronbach's Alpha. The Cronbach's Alpha coefficient obtained was 0.798, indicating a moderate level of internal consistency reliability. The scale consisted of 15 items in total.

## 2.4. Variables

**Outcome variables:**

- Anxiety symptoms (BAI)
- Somatic symptoms (checklists)

**Exposure variables and effect modifiers:**

- Gender (male/female)
- Age (continuous)
- Educational level (high school/university)

**Diagnostic criteria:**

- Anxiety and somatic symptoms were classified as significant based on established cut-offs for each scale.

## 2.5. Data Analysis

Quantitative variables (anxiety and somatic symptoms) were treated as continuous. Analyses were conducted using SPSS version 27 and included:

- **Pearson correlation** to examine the relationship between anxiety and somatic symptoms.
- **Independent-samples t-test** to compare scores between males and females.
- **ANOVA** to compare scores across educational levels.
- **Subgroup analyses** by gender and educational level to detect potential differences or interactions.

Missing data were minimal and handled using complete-case analysis. Weighting adjustments were applied to account for stratified sampling, ensuring proportional representation. A significance threshold of $p < 0.05$ was used for all analyses.

## 3. Results

A total of 150 adolescents participated in the study (73 females, 77 males; mean age = 17.13 ± 2.18 years). Participants included high school students (grades 10-12) and university students (years 1-3). Of 147 participants who provided residence information, 33.1% lived in urban areas and 66.2% in rural areas (Table 2). The mean anxiety score was 0.76 (SD = 0.6) and the mean somatic symptom score was 0.57 (SD = 0.35).

**Anxiety and somatic symptoms**

Participants reported a range of anxiety and somatic symptoms. The most frequently reported anxiety symptoms were nervousness, inability to relax, and fear of worst happening, whereas symptoms such as faintness and numbness were less frequent. Somatic symptoms most commonly reported included tiredness, sleep problems, headaches, and backache, while

symptoms such as pain during sexual intercourse and chest pain were less frequent. Detailed distributions of all symptoms are presented in Tables 3 and 4.

**Hypothesis 1 – Anxiety and somatic symptoms correlation:**

Pearson correlation analysis indicated a strong positive relationship between anxiety and somatic symptoms ($r = 0.725$, $p < 0.001$), supporting Hypothesis 1. Linear regression analysis confirmed that anxiety symptoms significantly predicted somatic symptoms ($B = 0.902$, $\beta = 0.574$, $p < 0.001$; $R^2 = 0.329$) (Tables 5-7).

**Hypothesis 2 – Gender differences:**

Independent-samples t-tests and one-way ANOVA showed that girls reported significantly higher levels of anxiety ($M = 0.986$ vs. $0.555$, $t = 4.774$, $p < 0.001$) and somatic symptoms ($M = 0.739$ vs. $0.416$, $t = 6.189$, $p < 0.001$) than boys. Gender accounted for 10.4% of the variance in anxiety levels ($R^2 = 0.104$) and 22.4% of the variance in somatic symptoms ($R^2 = 0.224$) (Tables 7-9). A post hoc power analysis confirmed the study was adequately powered (power ≈ 0.99) to detect these effects.

*Table 2 - Descriptive data*

| | **Sample** | | **Mean** | **SD** | **%** |
|---|---|---|---|---|---|
| | *Valid* | *Missing* | | | |
| **Gender** | 150 | 0 | | | |
| Woman/Girl | 73 | 0 | | | 48.7 |
| Man/Boy | 77 | 0 | | | 51.3 |
| **Age** | 150 | 0 | 17.13 | 2.18 | |
| **Level of education** | 150 | 0 | | | 28.0 |
| Grade 10 | 42 | 0 | | | 28.7 |
| Grade 11 | 43 | 0 | | | .7 |
| Grade 12 | 1 | 0 | | | 35.3 |
| Bachelor 1-st year | 53 | 0 | | | .7 |

| | | | | | |
|---|---|---|---|---|---|
| Bachelor 2-nd year | 1 | 0 | | | 6.7 |
| Bachelor 3-rd year | 10 | 0 | | | 28.0 |
| **Place of residence** | 147 | 3 | | | |
| Urban | 49 | 0 | | | 33.1 |
| Rural | 98 | 0 | | | 66.2 |
| **Anxiety** | 150 | 0 | .76 | .6 | |
| **Somatic Symptoms** | 150 | 0 | .57 | .35 | |

*Table 3 - The table presents the anxiety symptoms experienced by participants during the past month*

| | **Not at all** | **Mildly but it didn't bother me to much** | **Moderately – it wasn't pleasant at times** | **Severely – it bothered me a lot** |
|---|---|---|---|---|
| Numbness or tingling | 54.40% | 33.60% | 6.70% | 5.40% |
| Feeling hot | 44% | 33.30% | 20% | 2.70% |
| Wobbliness in legs | 41.20% | 36.50% | 14.20% | 8.10% |
| Unable to relax | 52.30% | 23.50% | 16.80% | 7.40% |
| Fear of worst happening | 36.90% | 22.10% | 21.50% | 19.50% |
| Dizzy or lightheaded | 44.30% | 29.50% | 16.80% | 9.40% |
| Heart pounding/racing | 36.20% | 30.20% | 22.10% | 11.40% |
| Unsteady | 51.40% | 18.90% | 16.90% | 12.80% |
| Terrified or afraid | 58.70% | 16.70% | 13.30% | 11.30% |
| Nervous | 12% | 28.70% | 28.70% | 30.70% |
| Feeling of choking | 71.30% | 15.30% | 9.30% | 4% |
| Hands trembling | 55.80% | 25.90% | 8.80% | 9.50% |
| Shaky/ unsteady | 57.70% | 21.50% | 9.40% | 11.40% |
| Fear of losing control | 65.30% | 16% | 12% | 6.70% |

| | | | | |
|---|---|---|---|---|
| Difficulty in breathing | 63.50% | 18.20% | 11.50% | 6.80% |
| Fear of dying | 76.40% | 12.80% | 6.10% | 4.70% |
| Scared | 58.70% | 24% | 10.70% | 6.70% |
| Indigestion | 75.30% | 17.30% | 5.30% | 2% |
| Faint/ lightheaded | 86.70% | 9.30% | 2.70% | 1.30% |
| Face flushed | 49.30% | 32% | 13.30% | 5.30% |

*Table 4 - Somatic Symptoms*

| | **Not At All** | **Somewhat** | **Often** |
|---|---|---|---|
| Stomach ache | 47.30% | 45.30% | 7.30% |
| Backache | 42.70% | 42.70% | 14.70% |
| Pain in the arms, legs or joints (knees, hips, thirst) | 37.80% | 50.70% | 11.50% |
| Menstrual pain or other problems with menstruation (ONLY FOR GIRL) | 48.00% | 26.00% | 26.00% |
| Headache | 31.50% | 45.00% | 23.50% |
| Chest pain | 71.10% | 22.80% | 6.00% |
| Dizziness | 60.00% | 30.00% | 10.00% |
| The feeling of turning off | 81.30% | 14.00% | 4.70% |
| Feeling your heart beat or beat | 55.80% | 31.30% | 12.90% |
| Shortness of breath | 76% | 17.30% | 6.70% |
| Pain or problems during sexual intercourse | 91.20% | 4.00% | 4.80% |
| Constipation, loose bowels or diarrhea | 79.00% | 16.00% | 5.00% |
| Nausea, gas or indigestion (upper middle part of the stomach) | 78.50% | 16.10% | 5.40% |
| Feeling tired or low on energy | 24.00% | 42.00% | 34.00% |
| Problems with sleep | 24.00% | 42.00% | 34.00% |
| Dizziness | 60.00% | 30.00% | 10.00% |

*Table 5 - Correlation between anxiety level and somatic symptoms*

| | | Somatic Symptoms |
|---|---|---|
| Anxiety | Pearson Correlation | .725** |
| | Sig. (2-tailed) | .000 |
| | N | 150 |

** Correlation is significant at the 0.01 level (2-tailed).

*Table 6 - ANOVA results for the linear regression model*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 48.012 | 1 | 48.012 | 72.709 | .000[b] |
| | Residual | 97.728 | 148 | .660 | | |
| | Total | 145.740 | 149 | | | |

*Table 7 - Linear regression coefficients for the model*

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.023 | .155 | | 6.590 | .000 |
| | Anxiety | .902 | .106 | .574 | 8.527 | .000 |

*Table 8 - Gender differences*

| | Gender | N | Mean | T | P |
|---|---|---|---|---|---|
| Anxiety | Girl | 73 | .9855 | 4.774 | .000 |
| | Boy | 77 | .5546 | | |
| Somatic Symptoms | Girl | 73 | .7385 | 6.189 | .000 |
| | Boy | 77 | .4158 | | |

*Table 9 - Tests of between-subjects effects for anxiety levels by gender*

**Tests of Between-Subjects Effects**

Dependent Variable: Anxiety

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 6.128[a] | 1 | 6.128 | 17.155 | .000 |
| Intercept | 265.968 | 1 | 265.968 | 744.589 | .000 |

| | | | | | |
|---|---|---|---|---|---|
| gjinia | 6.128 | 1 | 6.128 | 17.155 | .000 |
| Error | 52.866 | 148 | .357 | | |
| Total | 323.000 | 150 | | | |

a. R Squared = .104 (Adjusted R Squared = .098)

*Table 10 - Tests of between-subjects effects for somatic symptoms by gender*

| **Tests of Between-Subjects Effects** | | | | | |
|---|---|---|---|---|---|
| Dependent Variable: Somatic_symptoms | | | | | |
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
| Corrected Model | 32.578[a] | 1 | 32.578 | 42.607 | .000 |
| Intercept | 747.031 | 1 | 747.031 | 977.011 | .000 |
| gjinia | 32.578 | 1 | 32.578 | 42.607 | .000 |
| Error | 113.162 | 148 | .765 | | |
| Total | 885.000 | 150 | | | |
| Corrected Total | 145.740 | 149 | | | |

a. R Squared = .224 (Adjusted R Squared = .218)

## 4. Discussion

The relationship between anxiety and somatic symptoms in individuals aged 15-21 is crucial for understanding adolescent mental health. Anxiety frequently co-occurs with physical complaints such as headaches, muscle tension, and gastrointestinal disturbances. In this study, a strong positive correlation ($r = 0.725$, $p < 0.001$) was observed, supporting the hypothesis that higher anxiety levels are associated with more pronounced somatic symptoms. This finding aligns with prior research demonstrating the co-occurrence of emotional and somatic disturbances in adolescents (Kossowska et al., 2018; Lu et al., 2025).

Moreover, the results revealed that girls reported significantly higher levels of anxiety ($M = 0.9855$) and somatic symptoms ($M = 0.7385$) compared to boys ($M = 0.5546$ and $0.4158$, respectively), consistent with previous studies showing gender differences in anxiety expression (Berman & Kossowska, 2017; Sackl-Pammer et al., 2018). Social pressures, cultural norms, and gender expectations may amplify anxiety symptoms in girls (Santarossa & Cummings, 2021). Biological factors, such as hormonal

fluctuations during adolescence, may also contribute to these differences (Berman & Kossowska, 2017).

Contextual factors specific to Kosovo are also important. As a recently established post-conflict society, Kosovo has faced social, economic, and psychological challenges that may exacerbate anxiety and related somatic symptoms. Limited access to mental health resources, stigma surrounding mental health issues, and constrained public awareness can contribute to the underreporting or somatization of anxiety among adolescents (Tao et al., 2019; Gebreegziabher et al., 2024).

Cross-cultural comparisons suggest that these findings are not unique to Kosovo. For example, studies in China and Germany have similarly reported high prevalence of somatic complaints among adolescents with elevated anxiety levels (Lu et al., 2025; Geremek et al., 2024). Systematic reviews highlight that somatic symptomatology in adolescence is often intertwined with psychological distress, emphasizing the importance of culturally sensitive mental health interventions (Ludot et al., 2021).

Comorbidity is another consideration. Anxiety frequently coexists with depressive symptoms, chronic pain, or other psychiatric disorders, which may intensify somatic complaints (Britt et al., 2020). Failure to account for these comorbidities can obscure the true nature of the anxiety–somatic symptom relationship. The present findings underscore the importance of holistic assessment and intervention strategies that address both emotional and physical health needs in adolescents.

## Conclusion

This study investigated the relationship between anxiety and somatic symptoms among adolescents and young adults aged 15-21 in Kosovo. The findings indicate a strong positive correlation between anxiety and somatic symptoms ($r = 0.725$, $p < 0.001$), with girls exhibiting higher levels of both anxiety and somatic complaints compared to boys. These results highlight the significance of gender-specific differences and the necessity for targeted interventions.

The study emphasizes the importance of early identification and culturally sensitive psychosomatic care for adolescents, particularly in contexts where stigma and limited resources may impede access to mental health services. Policymakers and clinicians should integrate strategies that address both psychological and somatic components of distress. Future research should explore longitudinal trends, evaluate intervention

effectiveness, and examine the role of sociocultural factors in shaping adolescent mental health outcomes.

## Limitations

This study has several limitations. First, reliance on self-reported measures may introduce response bias, including underreporting or overreporting of symptoms due to social desirability or misunderstanding. Second, the study was conducted in a specific cultural and societal context (Kosovo), which limits the generalizability of the findings to other populations. Third, the exclusive use of quantitative methods may overlook nuanced insights, such as lived experiences or qualitative narratives, which could provide a deeper understanding of anxiety and somatic symptom dynamics.

Additionally, the cross-sectional design precludes causal inferences. While the study demonstrates associations between anxiety and somatic symptoms, it cannot establish directionality. Future research should adopt longitudinal and mixed-method approaches, incorporating qualitative data and diverse cultural contexts, to enhance the comprehensiveness and applicability of findings.

## Author contribution

It is hereby acknowledged that both authors have accepted responsibility for the content of the manuscript and have given their consent for its submission. They have carefully reviewed all the results and unanimously approved the final version of the manuscript.

## Ethics approval and consent to participate

This study was approved by the Ethics Committee of UBT – Higher Education Institution, reference nr. 7111. All data were treated confidentially, with no personal, identifiable, or sensitive information collected or analyzed. The data were generalized and processed in aggregate form, not pertaining to specific individuals. Additionally, parental consent was obtained for adolescents under the age of 18.

## Human and animal rights

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

## Consent for publication

Confidentiality and privacy were assured for all the participants, and

they were informed that all information would be kept strictly confidential. Lastly, each participant signed the informed consent form.

## Availability of data and materials

The data and supportive information are available within the article.


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None.


## Conflict of interest

The authors declare no conflict of interest, financial or otherwise.

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