Research Article

Academic-Related Stress Among Ghanaian Nursing Students

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Abstract

AIM: The life of a student may be affected by different stressors in both the internal and external environment. Although people from all walks of life experience stress on daily basis, students are more likely to experience stressful situations because of their academic requirements. To identify stressors among nursing students in Ghana.

METHODS: A cross-sectional survey was conducted among 400 students sampled from first year to fourth year students. Students were included in the study if they are above 18 years, nursing students and have been registered by the university for the 2019/2020 academic year.

RESULTS: A majority of the students (73.0%) perceived themselves to be stressed with academic-related work and cognitive, behavioural and emotional symptoms were highly prevalent among the students. Students enrolled in the regular programme were 0.09 times ($p < .0001$) less likely stressed than those in the modular stream of the training programme and female students compared to their male counterparts were 2.18 times ($p < .0001$) more likely feeling stressed.

CONCLUSION: The students with high cognitive symptoms also show high emotional and behavioural symptoms and vice versa. Nursing training institutions may consider further studies to investigate the impact of stress on academic performances and identify appropriate support students.

Keywords: Academic, Ghana, nursing, stress, students

Introduction

Stress is a negative construct that may be linked to many life- threatening situations. It may be considered as an individual’s reaction to demands made on the body or response to a disturbing event in the environment (Mathew, 2017). Stress is an element of daily life. An individual may feel pressured when expectations are extremely high and cannot be achieved readily. Some levels of stress may be motivating and helpful in achieving a productive life. However, excessive levels of stress experienced over a long period of time may induce significant physical and psychological problems (Alsulami et al., 2018). Stress can induce anxiety, depression, insomnia, and undermine the achievement of goals (Fasoro et al., 2019; Oku et al., 2015). In some cases, acute stress may cause sudden death in young people (Ezeh et al., 2016), and chronic stress as reported may impair development in children by lowering growth hormones (Kolk & Bassel, 2017). Stress may be induced by factors in both the internal and external environment. External factors include environmental pollutants, extreme temperatures, injuries, academic environment while internal factors refer to the reactions inside the body to a perceived threat in an environment and worrying psychological atmosphere (Amponsah & Owolabi, 2011; Mathew, 2017).

Academic-related stress is an individual’s response to academic requirements (Wilks, 2008). It involves mental distress regarding the anticipated fear of
academic failure. This may reflect in many ways, such as feeling overwhelmed while adjusting to college life, academic demands or requirements, a perceived obstacle to achieving personal goals, and integration into new systems. These factors are enough to threaten any student and induce mental distress (Amponsah & Owolabi, 2011; Mathew, 2017). Stressors show themselves in many aspects in an academic environment, home, and even in social circles. About 94% of medical students in Nigeria perceived their training program to be stressful (Oku et al., 2015). In the same study, about 82% identified excessive academic workload, 76.4% identified insufficient holidays, and 76.2% identified insufficient time for recreational activities as their sources of stress (Oku et al., 2015). The high stress level of about 73% was also reported among nursing student in Nigeria (Ezeh et al., 2016). The outcome of stress can be devastating as it can lead to negative behavior such as substance abuse (Kassel et al., 2003). The ability to minimize or tolerate stress is important to everyone.

Coping with stress is vital for human survival, and there are several strategies to reduce stress. Coping means investing one’s thoughts and behaviors to manage internal and external perceived threats (Folkman & Moskowitz, 2004) and adapt to perceived threatening situations. The individual’s ability to adapt to the stressful situation usually involves active or avoidant coping strategies. Adaptive behaviors aimed at changing or modifying stressors are considered active coping strategies and maladaptive behaviors that do not target stressors are considered avoidant coping strategies (Krohne, 1993). Academic-related stress may be reduced by active strategies such as effective time management, social support, and involvement in recreational activities (Blake & Vandiver, 1988).

Although people from all walks of life experience stress on a daily basis, students are more likely to experience stressful situations because of their academic requirements. Also, students are able to modify threatening situation when they adopt effective coping mechanism thus resulting in a better outcome and lesser rate of depression. Although some levels of academic stress may be beneficial, the requirement of nursing training programs precipitates excessive stress among nurse trainees, and this needs to be identified early and managed appropriately to enhance their educational preparedness. Unfortunately, the assessment of academic-related stress has not gained much attention in Ghana. Therefore, this current study aims at identifying various stressors among nursing students in Ghana, the impact of stress on their academic performances, and the coping mechanisms used by these students. It is expected that findings from this study will help to improve our understanding of stress in a collegial environment, and ultimately contribute to the development of interventions to enhance the educational preparedness of nursing students locally and internationally.

Given the background and research problem, the importance of understanding the individual’s response or reaction to demands made on the body or response to a disturbing event in the environment the following research questions have guided this study:

**Research Questions**
1. What are the factors precipitating stress among nursing students in Ghana?
2. What is the impact of the nursing training programs on the students?

**Method**

**Study Design**
This is a descriptive cross-sectional study.

**Sample**
The students were sampled from the School of Nursing and Midwifery, and were then stratified into program streams (Regular and Modular streams). The students were also identified from the first year through to the fourth year of the program, and they were included in the study if they were above 18 years, pursuing a nursing program, and have been registered by the university for the 2019/2020 academic year. Using the formula for precision around a proportion in a single cross-sectional survey (Gorstein et al., 2007) at α = 0.05, the desired level of absolute precision of ±5, and an expected proportion of 0.50, the estimated sample size for this survey was 400. Considering missing data and potential withdrawal, 10% (n = 40) was added giving a total of 440 students. Forty students did not return their completed survey questionnaires because they had challenges with study leave approvals and, therefore, deferred their programs of study. Others also indicated they could not complete the questionnaires.
due to busy schedules. This group of students was excluded from the study.

Data Collection
A standard modified version of the Hassles Assessment Scale (Kohn et al., 1990) self-administered questionnaire was used for the data collection. The survey instrument was pretested and refined based on input from 30 students at the same school who did not form part of the main study. This was done to assess the appropriateness of wording, acceptability, and suitability of the instrument. The study collected data on the following: (i) socio-demographic characteristics; (ii) perceived academic-related stress; (iii) sources of stress, and (iv) coping strategies for managing stress. To assess perceived stress, the students were asked the following: “Do you feel pressured or stressed with your academic requirement?” Those who responded “Yes” were further presented with a list of stressors (Kohn et al., 1990; Pett & Johnson, 2005; Sarafino & Ewing, 1999) that included lectures, assignments, teaching times table, family obligations, fear of low grades, work, and finance so they can identify stressors. This was a multiple-response questionnaire, and the students could choose more than one option. The students were asked questions assessing the construct: cognitive, behavioral, and emotional symptoms using 23 individual items. The students were indicated on a 5-point Likert scale (ranging from 1-never to 5-extremely) to express the extent to which they experience a particular symptom. Stress coping mechanism was also assessed among the students using six individual items.

Statistical Analysis
Chi-square test with Fisher’s exact test (where appropriate) was used to establish association among the study variables, and logistic regression analysis was done to identify predictors of perceived stress. Exploratory factor analysis was also done to measure the various factors loading on academic-related stress. Confirmatory factor analysis was further conducted to help model the correlations between latent factors of level of academic-related stress and relationship among cognitive, emotional, and behavioral symptoms. The maximum likelihood estimator aimed at fitting the hypothesized model was assessed using root mean square error of approximation (RMSEA), standardized root means square residual (SRMR), comparative fit index (CFI), Tucker–Lewis index (TLI), and a relative chi-square test statistic. These fit indices are commonly used in fitting measurement models (Al Salem et al., 2019; Angel et al., 2019).

Ethical Consideration
School of Nursing and Midwifery, University Ethical approval was granted by the UHAS-REC (ID No: UHAS-REC A.1 (33) 19-20). Written informed consent was also obtained from all study participants.

Results

Socio-Demographic Characteristics
The socio-demographic variables included program level, gender, age, marital status, number of children, religion, ethnic group, and residential status. Table 1 presents the distribution of the socio-demographic variables.

A majority of the participants (51.0%) were female students, 48.3% were enrolled in the modular (sandwich) program, almost half of the students (49.0%) were above 26 years, 84.0% were Christians, only 26.0% were married, and 74.3% did not have children. About half of the students (49.0%) lived in rented apartments and the first-year students were the least (16.5%) participants.

Sources of Perceived Stress
A summary of the response to the question identifying sources of perceived stress among the students is presented in Table 2.

The variables such as examinations, lack of money, bills, lectures, experiential learning, early morning classes, and assignments were mostly ranked by the students above 70.0% as sources of stress. The least source of stress was pregnancy (36.0%).

Initial bivariate analysis was conducted and all the previously perceived sources of stress were significantly associated with perceived stress. A second step of multivariate logistic regression analysis, including all the variables from the bivariate analysis (Table 2), was conducted. A backward elimination stepwise method was used and those variables with a $p \leq .05$ were considered significant predictors of perceived stress. The results are presented in Table 3.

Six independent variables were statistically significant in predicting stress among the students. The omnibus test reported a $p \leq .0001$ and the goodness-of-fit test, the Hosmer-Lemeshow test ($p$ of .036),
The logistic regression model is a good fit for the data. The Nagelkerke R square value was 0.59 and the model explains that about 59% of the variation in perceived stress. Program duration and unavailable lecture space were not statistically significant; \( p = 0.051 \) and \( p = 0.079 \), respectively.

Students enrolled in the regular program were 0.09 times \( (p < .0001) \) less likely to experience stress than those in the modular stream of the training program, female students compared to their male counterparts were over 0.02 times \( (p < .0001) \) more likely to experience stress, and married students were over 13 times \( (p < .0001) \) more likely to feel stressed than those not married.

### Exploratory Factor Analysis of Academic-Related Stress

An exploratory factor analysis was used to explore factors constituting academic-related stresses.
A test for sampling adequacy measure (The Kaiser–Meyer–Olkin) reported 0.939, which is more than 0.6 and Bartlett’s test of sphericity reported 5107.250 ($p < .0001$), thus suggesting sample adequacy and factor analysis can be done (Chan & Idris, 2017). Using Varimax rotation on the 23 items, the cumulative variance distribution showed that only four factors were extracted to explain 55% of the variation in perceived stress among the students. These factors are cognitive symptoms, behavioral symptoms (BS), physical symptoms, and emotional symptoms (ES). Cognitive symptoms loaded on two different factors, and all were confirmed with scree plot and they produced eigenvalues greater than 1. Items that had cross-loadings higher than 0.3 and loadings of 0.4 and below were excluded before the confirmatory factor analysis (Al Salem et al., 2019). All the items for physical symptoms were excluded from confirmatory analysis because they cross-loaded on other factors. A Cronbach’s alpha for all the 23 items was 0.938 implying these items could be used in measuring the corresponding factors. And the selected items for confirmatory factor analysis reported a Cronbach’s alpha of 0.909.

### Confirmatory Factor Analysis

Cognitive, emotional, and behavioral symptoms were successfully measured with manifest variables, and relationships between them were modeled. As indicated earlier, physical symptoms did not yield any significant value, therefore, excluded from this analysis. The results are presented in Figure 1.

The model fit indices were RMSEA of 0.069, SRMR of 0.037, CFI of 0.965, and TLI of 0.949, with a relative chi-square of 2.89, indicating that the model data fitted was appropriate and can explain the covariance structure of the observed data. All the one-sided arrows show a standardized variable loading from a manifest to a latent variable while the two-sided arrows show the strength of correlation between the latent variables. The items poor judgment, pessimism, and recall challenges measured the first factor with poor judgment loading the highest cognitive symptoms. Recall challenges loaded the least item on the cognitive symptom. The second factor was measured by anxiety or racing thoughts, inability to concentrate, and constant worrying. The inability to concentrate also loaded highest on cognitive symptoms while anxiety or racing thoughts loaded the least. The behavioral symptoms were also measured by eating more or less and sleeping too much or too little. Eating more or less loaded more to behavioral symptoms. Emotional symptoms were measured using feeling depressed or generally unhappy, agitation, moodiness, irritability or anger, loneliness, and isolation. Agitation loaded the highest while loneliness and isolation loaded the least.

### Discussion

In recent years, there has been a tremendous expansion in the number of nursing training institutions with different training curricula in Ghana. Considering that academic-related stress has become a persuasive public health issue and very little is known.

| Variables          | Estimated $\beta$ | Adjusted OR | 95% CI (Exp-$\beta$) | $p$  |
|--------------------|-------------------|-------------|----------------------|------|
| Constant           | $-7.158$          | 0.001       |                      |      |
| Lectures           | $0.779$           | 2.179       | 1.39–3.46            | .001 |
| Assignment         | $0.523$           | 1.687       | 1.09–2.60            | .018 |
| Examination        | $0.530$           | 1.700       | 1.20–2.39            | .002 |
| Leave              | $-0.832$          | 0.435       | 0.25–0.75            | .003 |
| Work               | $0.608$           | 1.837       | 1.06–3.19            | .031 |
| Duration           | $0.433$           | 1.542       | 0.99–2.38            | .051 |
| Space              | $0.343$           | 1.409       | 0.96–2.07            | .079 |
| Care study         | $0.398$           | 1.490       | 1.21–1.83            | .000 |

Note: **Predictor Variables entered into step 1: lecture, assign, exam, leave, work, duration, time, research, pregnant, early, care study, lecture space, accommodation, experiential training, bill, money, extra, grade. OR = odds ratio.
about the appropriateness of the training environments in Ghana and other developing countries, this study aims at identifying various stressors among nursing students. This study revealed that about three out of every four students experience stress and cognitive, behavioral, and emotional symptoms were highly prevalent among the students. Cognitive symptoms had a strong positive correlation with emotional symptoms and behavioral symptoms thus students with high cognitive symptoms also show high emotional and behavioral symptoms and vice versa. The prevalence of stress among university students has been reported (Asif et al., 2020; Joseph et al., 2020; Kumar et al., 2019), suggesting that university students are experiencing academic challenges. Nursing students especially are likely to be affected because the curricula for training nurses include competency-based training and extra professional requirements. This requires trainee nurses to acquire knowledge, attitude, and skillsets through classroom teaching and experiential training. This can be overwhelming for some students. It is, therefore, important that nursing training institutions understand these challenges and provide support systems during the training. The logistic regression analysis identified lectures ($p = .001$), assignments ($p = .018$), examination ($p = .002$) as predictors of academic stress among the students, and this is similar to reports among undergraduate medical students by Joseph et al. (2020) who reported academic information and fear of failure as sources of stress among undergraduate medical students in Mangalore. Academic-related activities and financial obligations were mostly ranked high as sources of stress by the students. These finding are in line with findings in available literature (Al-Dubai et al., 2011; Ezeh et al., 2016; Majumdar & Ray, 2010).

An important finding by this study is that all the socio-demographic characteristics are significantly associated with students feeling pressured. Students’ stream of study, (Regular or Modular stream), age, gender, marital status, number of children, ethnicity, and type of residence were all highly associated with the students’ perceived level of stress ($p < .0001$). Female students were two times more likely to feel stressed than the male students ($p < .0001$), and considering that previous studies also reported similar findings (Alsulami et al., 2018; Ezeh et al., 2016; Reddy et al., 2018) may be an indication of a struggle among female students in an academic environment. This discrepancy between male and female nursing students may be taken into consideration by training institutions when offering opportunities to students. Students who were married were about 0.014 times more likely to be stressed than those who are single ($p < .0001$). This may be due to the fact that married women have other family obligations in addition to their academic demands. This is likely to induce challenges with concentration and program completion. More studies are needed to investigate appropriate counseling interventions for this sub-group of students. The university environment (program duration and lecture space) were not significant ($p = .051$ and $p = .079$, respectively) in predicting stress among the students. This contrasts previous report (Ezeh et al., 2016). However, further studies are required to investigate a broader spectrum of variables related to the academic environment and level of stress among students (Table 4).
Students in the regular (16 weeks per semester) stream were 0.09 times (\(p < .0001\)) less likely to be stressed with academic-related activities compared to students in the modular stream (6 weeks per Module). The modular program has fewer weeks to complete, and it is designed to accommodate working and schooling alongside. However, this finding suggests that students are more likely to be stressed in the modular program compared to the regular stream. The extra demands of work and other social responsibilities may have contributed to this finding; however, more studies may investigate and recommend coping mechanism and appropriate support system for working students in the modular stream.

**Study Limitation**

The limitation of this study is that the study was conducted among only nursing students without including students in different disciplines of study.

**Conclusion and Recommendation**

All the socio-demographic characteristics were statistically associated with perceived stress, however, the university environment was not associated with perceived stress among students. The students with high cognitive symptoms also show high emotional and behavioral symptoms and vice versa. Considering that stress levels can affect students’ mental and physical health and ultimately increase their risk of premature mortality, there is a need for the training institution to provide accessible support services in a form of counseling services and financial aids that are easily assessable to students.

The study findings highlight the need for nursing training institutions to avoid structuring nursing training education over a short period of time as this mode of training can induce stress among students.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of University of Health and Allied Sciences Institute of Health Research (Date: October 25, 2019, Protocol No: UHAS-REC A.1 [33] 19-20).

**Informed Consent:** Written informed consent was obtained from all students who participated in this study.

**Peer View:** Externally peer-reviewed.

**Author Contributions:** Concept – J.A.A.T., E.T., D.A., O.M.A., A.E., N.S.; Design – J.A.A.T., O.M.A., A.E., N.S.; Supervision – J.A.A.T.,

### Table 4. Association Between Socio-Demographics Characteristics and Feeling Pressured

| Demographic Characteristics | Perceived Stress | OR (95% CI) | p |
|-----------------------------|------------------|-------------|---|
| **Stream of program**       |                  |             |   |
| Regular                     | 28.0             | 23.8        | 0.09 (0.05, 0.16) | <.0001 |
| Sandwich                    | 45.0             | 3.3         |              |        |
| **Level of studies**        |                  |             |   |
| Level 100                   | 10.0             | 6.6         | .0001 |
| Level 200                   | 16.5             | 10.8        |       |
| Level 300                   | 24.3             | 4.0         |       |
| Level 400                   | 22.3             | 5.8         |       |
| **Gender**                  |                  |             |   |
| Female                      | 41.0             | 10.0        | 2.18 (1.38, 3.43) | .001 |
| Male                        | 32.0             | 17.0        |       |
| **Age**                     |                  |             |   |
| 15–20 years                 | 4.5              | 3.0         | <.0001 |
| 21–26 years                 | 23.5             | 19.7        |       |
| 27–32 years                 | 27.2             | 4.0         |       |
| 33 years and above          | 17.8             | 0.3         |       |
| **Marital status**          |                  |             |   |
| Married                     | 25.0             | 1.0         | 13.54 (4.85, 37.84) | <.0001 |
| Not married                 | 48.0             | 26.0        |       |
| **Number of children**      |                  |             |   |
| 1–2 children                | 20.2             | 0.8         | <.0001 |
| 3–4 children                | 4.3              | 0.4         |       |
| None                        | 48.5             | 25.8        |       |
| **Ethnicity**               |                  |             |   |
| Akan                        | 25.8             | 9.0         | .001 |
| Ewe                         | 21.0             | 12.8        |       |
| Ga-Adangme                  | 15.2             | 4.0         |       |
| Hausa                       | 11.0             | 1.2         |       |
| **Type of residence**       |                  |             |   |
| Private hostel              | 20.5             | 5.8         | <.0001 |
| Rented apartment            | 42.5             | 6.2         |       |
| School hostel               | 10.0             | 15.0        |       |
| **Religion**                |                  |             |   |
| Christianity                | 59.2             | 24.8        | .014 |
| Islamic                     | 13.3             | 2.0         |       |
| Traditional                 | 0.5              | 0.2         |       |

Note: OR = odds ratio; CI = confidence intervals.
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