**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF HEALTH SCIENCES**

**FACULTY OF ALLIED HEALTH SCIENCES**

**DEPARTMENT OF MEDICAL DIAGNOSTICS**



**PREVALENCE OF BURNOUT AMONG MEDICAL IMAGING STUDENTS IN GHANAIAN PUBLIC UNIVERSITIES**

**BY**

**OSEI PRISCILLA**

**(3322720)**

**SUPERVISED BY**

**MADAM DORIS KITSON-MILLS**

**MADAM ALBERTA AGYEI**

**Abstract**

**Background**: Burnout syndrome is a condition that may occur not only for staff in human service sectors/jobs, involving intensive interactions with others, but also people that are engaged in activities psychologically similar to work, such as students. Medical imaging students in training suffer double stress, first linked to the status of being a university student and secondly as early career workers who have relations with the public of the health system.

**Aim**: This study aims to investigate the prevalence of burnout among medical imaging students at Ghanaian universities.

**Method**:In order to gain a better understanding of nature of the burnout syndrome, a cross-sectional study and a modified version of Maslach Burnout Inventory (MBI) questionnaire (investigating three areas: emotional exhaustion, depersonalization and reduced personal accomplishment), will be administered to medical imaging students in Ghanaian public universities (from the 2nd year to 4th year of course) and analyzed using SPSS and Excel.

**Anticipated Output**: The study is expected to provide a comprehensive understanding of the extent of burnout among medical imaging students in Ghanaian universities and contribute to the body of knowledge on student’s burnout.

**Conclusion:** The research outcomes will suggest the presence of emotional burnout, or risk of burnout, among 2nd year students to 4th year students which will be statistically significant. It will also assume that the high degree of “past failures, feeling of self-failure” observed among all student, is related to a feeling of poor efficacy and poor self-worth that appear to grow from the beginning of the course. Medical imaging students experience some of the same clinical stressors as workers and other Allied Health workers, although the source of stress may be different. Implementing prevention strategies of burnout may be beneficial to promote optimum clinical learning environment for students such as instructor availability, opportunities to practice skills, frequent performance feedback and assurance that mistakes do happen. The provision of academic counseling can relieve students' emotional stress and therefore reduce the risk of burnout.

**Keywords;** Burnout, Medical Imaging, Students, Ghanaian Universities.

**CHAPTER ONE**

**INTRODUCTION**

**1.0 Overview**

Burnout syndrome is considered a psychological state resulting from prolonged exposure to work stressor. Maslach & Jackson defined burnout as a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do “people work” of some kind (Maslach et al., 2001). Emotional exhaustion (EE) refers to feelings of being overextended and depleted of emotional resources (Maslach & Leiter, 2016). Depersonalization (DP) is characterized by a negative, cynical, and detached response to the people including colleagues and supervisors (Maslach & Jackson, 2001). A feeling of reduced personal accomplishment (PA) occurs when a person feels less competent regarding professional efficacy (WHO, 2020). It is the pathological result of a stressor process related to occupations characterized by intense interpersonal relationships, when professionals do not adequately respond to workloads caused by combination of stress and hard-work (Maslach et al., 2001). Burnout is a reaction to the imbalance between work-related demands and personal resources, and it is manifested in three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment which represent basic personal stress, interpersonal environment, and the self-evaluation dimensions of burnout, respectively (Maslach et al., 2001, Rouleau et al., 2012). This condition may be applied to all individuals who engage in activities that are psychologically similar to work, such as students (Prins et al., 2010, Costa et al., 2012). This psychological condition may be exacerbated by a number of conditions such as fear of examinations, poor communication with the teaching staff, stress for class schedules and training courses, the uncertainties of the future (Schaufel et al., 2002). Exist three main dimensions of burnout that are assessed in the Maslach Burnout Inventory (MBI) (Maslach et al., 2001), the worldwide leading instrument for the assessment of burnout: – emotional exhaustion: feeling tired, private of all energy (for students: due to educational demands); – depersonalization: loss of any positive attitude towards himself, the world and others (for students: indifference/apathetic attitude toward academic activities); – reduced personal accomplishment/low professional efficacy: feelings of frustration, anger, loss of self-esteem and desire to change or leave the job (for students: perception of incompetence as a student) (Carlotto et al., 2006). Example of burnout syndrome was described in people who work in the caring professions, such as the health services, social workers, psychologists, teachers and policemen (Amoafo et al., 2015, Dyrbye et al., 2014). Moreover, the problem could be quite relevant in medical students, such as medical imaging students in training, that suffer double stress, first linked to the status of being a university student and secondly as early career workers who have relations with the public of the health system (Shanafelt et al., 2012).

Until recently, occupational burnout syndrome was not listed as a legitimate syndrome in the widely accepted classification systems. However, burnout is currently recognized as an occupational acquired phenomenon and is not a classified medical condition but it is officially included in the 11th Revision of the International Classification of Diseases (ICD-11) (WHO, 2019). Recent research underscored the large burden of profession-related burnout among medical students (Ripp et al., 2011). Medical imaging students endure stress due to numerous reasons including the strenuous nature of the training program, a requirement to absorb a great deal of information over short periods of time, interaction with disease, and financial burdens. These academic, existential and psychological stressors may cause students to experience deteriorating mental health during the course of their studies (Dyrbye et al., 2014). Burnout among medical imaging students has many implications due to its association with absenteeism, low morale and dissatisfaction (Schaufeli et al., 2002). Burnout may also be associated with adverse outcomes at an individual level including poor decision making, hostility to patients, medical errors, poor relationships with colleagues, depression, anxiety and fatigue, sleep disturbances, alcoholism, drug misuse, and suicidal ideation (Kumar et al., 2016).

These components collectively contribute to the manifestation of burnout, posing detrimental effects on students, patient care quality, and healthcare systems at large. Therefore, understanding the prevalence and underlying factors contributing to burnout among medical imaging students at Ghanaian universities is crucial for devising effective interventions to mitigate its impact and enhance overall well-being and performance of students within the profession.

**1.1 Justification of the Study**

Burnout syndrome has traditionally been associated with professionals in high-stress, people-oriented jobs, such as healthcare workers, social workers, and teachers (Maslach et al., 2001). However, recent studies indicate that students, particularly those in demanding fields like medical imaging, are equally susceptible to burnout (Prins et al., 2010; Costa et al., 2012). The stressors for these students are twofold: the inherent pressures of being a university student, and the added responsibilities of their clinical training and early career roles in the health system (Schaufeli et al., 2002; Shanafelt et al., 2012).

Medical imaging students at the Ghanaian universities face unique challenges that can exacerbate burnout, including intense academic demands, the need to master complex technical skills, frequent interactions with patients, and the stress of impending professional responsibilities (Dyrbye et al., 2014). These stressors can lead to emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment, which collectively impact their academic performance, mental health, and future career prospects (Maslach & Leiter, 2016; Kumar et al., 2016).

Despite the recognition of burnout in medical and allied health students globally, there is a lack of focused research on medical imaging students in Ghana. This study aims to fill this gap by providing empirical data on the prevalence and dimensions of burnout among these students. Understanding the specific factors contributing to burnout in this population will inform the development of targeted interventions to support students' well-being, enhance their educational experience, and ultimately improve the quality of care they provide in their professional roles (Ripp et al., 2011; WHO, 2019).

**1.2 Problem Statement**

Burnout among medical imaging students at the Ghanaian universities is an under-researched phenomenon that presents significant implications for both the students' personal well-being and their professional development. Existing literature highlights the high levels of stress and burnout in healthcare and allied health students, but specific data on medical imaging students in the Ghanaian context is sparse (Amoafo et al., 2015; Dyrbye et al., 2014).

These students endure double stress: the general pressures of university life and the specific challenges associated with their clinical training. This compounded stress can manifest as emotional exhaustion, depersonalization, and a diminished sense of personal achievement, potentially leading to negative outcomes such as poor academic performance, mental health issues, and decreased professional competence (Maslach et al., 2001; Schaufeli et al., 2002).

The need to systematically assess and address burnout in this specific student population is critical. Without a clear understanding of the prevalence and nature of burnout among medical imaging students, efforts to mitigate its impact and support student well-being remain unfocused and potentially ineffective. This study seeks to investigate the extent and dimensions of burnout in this group, thereby contributing valuable insights that can guide the development of effective support and intervention strategies (Maslach & Jackson, 2001; WHO, 2020). Radiographers, who play a crucial role in diagnosing and treating diseases, are not immune to this phenomenon (Smith & Hughes, 2017). Despite the critical role they play, there is a paucity of research focusing on the prevalence of job burnout among radiographers, particularly in Ghana (Adams et al., 2017).

Burnout can lead to decreased productivity, increased turnover, and compromised patient care. It occurs when healthcare professionals feel overwhelmed, emotionally drained, and unable to meet constant demands (Maslach & Leiter, 2016; Shanafelt et al., 2017). The high workload and the pressure to maintain accuracy and speed can contribute to stress and burnout among radiographers (Adams et al., 2017; Maslach & Leiter, 2016).

By shedding light on this overlooked issue, we hope to contribute to efforts aimed at improving the working conditions and mental health of these essential healthcare professionals (Adams et al., 2017; Maslach & Leiter, 2016). This research is timely and relevant, considering the increasing demands on healthcare systems globally and the pivotal role radiographers play in patient care (WHO, 2019; Smith & Hughes 2017).

**1.3 Significance of the Study**

This study will provide valuable insights into the prevalence and dimensions of burnout among medical imaging students at Ghanaian universities. The findings will inform the development of strategies to mitigate burnout, enhance student well-being, and improve the quality of education and patient care (Schaufeli et al., 2002; Kumar et al., 2016). Also, the significance of this study lies in its potential to contribute to the body of knowledge on burnout among medical imaging student at Ghanaian universities. Understanding the prevalence of burnout among medical imaging student at the Ghanaian universities could have several important implications. For instance, students’ well-being, academic performance, professional development, retention and attrition, and healthcare system impact.

Overall, the study findings could inform policies to promote student well-being, enhancing workforce resilience, and ultimately improving the quality of patient care within the healthcare system.

In summary, the study's contribution to the global discourse lies in its potential to generate knowledge, inform policy and practice, foster collaboration, and advocate for positive change in healthcare education and workforce development worldwide. By sharing findings, insights, and experiences, stakeholders can work together to create supportive environments that nurture the well-being of healthcare students and professionals across diverse cultural and institutional contexts.

**1.4 Aim of the Study**

To investigate the prevalence of burnout among medical imaging students at the Ghanaian universities.

**1.5 Objectives of the Study**

1. To determine the prevalence of emotional exhaustion among medical imaging students.

2. To assess the degree of depersonalization experienced by these students.

3. To evaluate the sense of personal accomplishment among medical imaging students.

4. To identify factors contributing to burnout in medical imaging student population.

**1.6 Research Questions**

1. What is the prevalence of emotional exhaustion among medical imaging students?

2. What is the degree of depersonalization experienced by these students?

3. How do medical imaging students perceive their personal accomplishment?

4. What factors contribute to burnout among medical imaging students?

**1.7 Research Hypothesis**

Medical imaging students at Ghanaian universities experience significant levels of burnout, as evidenced by elevated scores in emotional exhaustion, depersonalization, and reduced personal accomplishment.

**1.8 Null Hypothesis**

Medical imaging students at Ghanaian universities do not experience significantly higher levels of burnout compared to other student populations, with no significant differences in emotional exhaustion, depersonalization, and reduced personal accomplishment.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.0 Overview**

This chapter provides a systematic review of the prevalence of burnout among medical imaging students in Ghanaian public universities. It outlines the data sources and search strategy, inclusion and exclusion criteria, study selection, data extraction and outcomes of the included studies.

**2.1 Data Source and Strategy**

Two electronic databases were used for the search, specifically Cochrane Library and PubMed. A hand search on Google scholar was used to supplement the database search. The choice of electronic databases was based on their easy accessibility and their continuous updating of data, ensuring the availability of the latest information. The search strategy employed terms related to burnout, medical imaging, and students. Boolean operators "AND" or "OR" were used to combine search terms. A hand search through Google Scholar was conducted for additional studies.

**2.2 Inclusion and Exclusion Criteria**

Inclusion criteria were limited to studies reporting primary research findings on prevalence of burnout among medical imaging students, which were published in English. There were no restrictions on publication year. Exclusion criteria encompassed studies without full text (only abstract), those not addressing the prevalence of burnout among medical imaging, editorials, comments, and studies not centered on burnout among medical imaging students.

**2.3 Study selection**

Following the electronic database searches, all pertinent citations were gathered and imported into the Endnote Version 20 reference manager to eliminate duplicates and for storage purposes. The titles and abstracts of the retrieved citations were assessed for relevance and adherence to the inclusion criteria. Full texts of potentially relevant articles identified during the abstract review were obtained and screened. Articles that did not satisfy the inclusion criteria upon full-text assessment were excluded, accompanied by justifications for their exclusion.

**2.4 Data extraction**

A table was generated to extract information from each included study. The extracted data encompassed authors, publication year, country, study aims and design, key study findings, and limitations of the study.

**2.5 Results**

A comprehensive search on the subject under study was done with the help of PubMed and Cochrane library electronic databases. An initial search through the Cochrane library and PubMed electronic databases yielded 338 studies of which 4 duplicates were removed. The remaining 334 articles were screened by the title and abstract and had 271 articles removed because they did not meet the inclusion criteria. The 63 articles remaining were then reviewed for eligibility of which 7 were found to be eligible for inclusion. An additional 1 article was included through hand search. Finally, eight (8) articles were included in this review reporting on the prevalence of burnout among medical imaging students

**Figure 1:PRISMA flow diagram**

Records identified from\*:

PubMed (n =20)

Cochrane (n =318)

Records removed before screening:

Duplicate records removed

(n = 4)

Records screened

(n=334)

Records excluded\*\*

(n =271)

Reports sought for retrieval

(n =63)

Reports not retrieved

(n =0)

Reports assessed for eligibility

(n =63)

Reports excluded:

Not focused on burnout among medical imaging students

(n =34)

Full text not available (n=20)

Records identified from:

Google Scholar (n =1)

Reports assessed for eligibility

(n =1)

Reports excluded:

Not related to topic (n = 0)

Studies included in the review

(n =8)

**Identification of studies via databases and registers**

**Identification of studies via other methods**

**Identification**

**Screening**

**Included**

Reports sought for retrieval

(n =1)

Reports not retrieved

(n =0)

Table 1: Characteristics of included studies

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean** | **Key Findings** |
| Barbosa et al.,2018 | Brazil | Females (55.6%)  Males (44.3%) | To identify the prevalence of burnout and associated factors in Brazilian medical students | A cross-sectional study | A non-probabilistic and convenience sampling | 399 students | 21years | * The prevalence of burnout in the sample was 12.0%. * The fifth period of the Medicine course had the highest burnout rate compared to other periods. * Female students were more affected by burnout syndrome compared to male students. * The study found statistically significant correlations between the dimensions of burnout syndrome, suggesting a probable cause-effect relationship between emotional exhaustion and disbelief. * The study suggests that the Problem-Based Learning (PBL) teaching method may represent a strategy for the prevention of burnout among medical students. * Pedagogical and preventive actions to reduce stress among medical students should be directed mainly at higher-risk categories, such as students in the fifth period of the Medicine course and female students |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Nteveros et al., 2020 | Cyprus | Females (65.5%)  Males (34.5%) | To estimate the burnout prevalence among all medical students at the medical school of the university of Cyprus. The secondary aims were to ascertain the predictors of burnout and its relationship with lifestyle habits, sleep quality, and mental health. | A cross-sectional study | Convenience sampling | 189 eligible candidates with response rate of 96.3% resulting in 182 participants | 21.8 years | * The burnout prevalence among medical students was found to be 18.1%. * There was a significant linear effect between the academic year of study and the frequency of burnout, with more students experiencing burnout as they progressed in their studies, especially after the 4th year of education. * Students in clinical years (4th to 6th) had a higher prevalence of burnout compared to students in non-clinical years (1st to 3rd). * Students with burnout had worse mental health and were more likely to have poor sleep quality compared to students without burnout. * No significant effects of sex, age, marital status, academic performance, decision on specialty, exercise, smoking, alcohol, or BMI were found in relation to burnout |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Kajjimu et al., 2021 | Uganda | Males (102)  Females (43) | To determine the prevalence of burnout and factors associated with its department among student pursuing Bachelor of Medicine and Bachelor of Surgery degrees at Mbarara University of Science and Technology | Cross-sectional study | Consecutive sampling | 145 medical students | 23 years | * 54.5% of the medical students experienced burnout based on the Maslach Burnout Inventory – Student Survey (MBI-SS) tool. * 93.1% of students had high emotional exhaustion scores, 62.1% had low professional efficacy scores, and 97.2% had high cynicism scores. * Choosing to pursue the MBChB program willingly was identified as an independent predictor of burnout |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Mahfouz et al., 2020 | Saudi Arabia | Females (53.2%)  Males (46.8%) | To assess the prevalence of burnout syndrome and its associated factors among medical students in Jazan University in Saudi Arabia | Cross-sectional study | A random sampling method | 440 medical students | 21.91 years | * The overall prevalence of burnout was 60.2%, with higher rates among females (64.1%) compared to males (56.2%). * Personal burnout had the highest average scores, followed by study-related and client related burnout. * Lower age, being female, and having better burnout knowledge were linked to higher personal burnout scores. * Factors such as burnout knowledge, academic year and CGPA were associated with high study-related burnout. * Age and CGPA were significant predictors of high client-related burnout. |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Prata et al., 2021 | Brazil | Males (50.2%)  Females (49.8%) | To estimate the current prevalence of burnout syndrome among medical students at the Federal University of Sergipe and identify its associated factors. | A cross-sectional study | Random selection | 213 students | 23 years | * The prevalence of burnout syndrome was 21.6% based on the three-dimensional criterion and 51.6% based on the two-dimensional criterion. * Factors strongly associated with burnout syndrome included rarely receiving the emotional support needed during the program, thinking about dropping out of the undergraduate, and considering one's academic performance to be regular or weak. * The traditional teaching model was not found to be a factor associated with burnout syndrome. * The prevalence of burnout syndrome was higher at the UFS-AJU campus compared to the UFS-LAG campus. * Previous studies at the same institution indicated high levels of mental illness among medical students, with associations to factors related to the teaching-learning sphere. * Geographic location may play a role in the prevalence of burnout syndrome, with Oceania and parts of the Middle East showing higher levels compared to Central and South America and Europe. |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Capdevila-Guadens et al., 2021 | Spain | Females (76.3%)  Males (22.9%) | To conduct a nationwide analysis of the prevalence of mental health problems, specifically depression, anxiety, burnout, and empathy, among medical students in Spain | Cross-sectional study | Convenience sampling | 5,216 medical students | 21.41 years | * Depression: The study found that depression was associated with a five-fold risk of having depressive symptoms, with factors such as high burnout and physical health problems also playing a significant role. * Burnout: The odds ratio for burnout revealed an association with depression, with academic performance problems and engaging in clinical rotations being important factors. * Anxiety: Both trait and state anxiety were closely related to each other, as well as to working while studying and having financial problems. * Empathy: Empathy was closely associated with being a woman, engaging in clinical rotations, and having a high level of social support. * Substance Abuse: The study also reported on substance abuse among medical students, with percentages of smoking, cannabis use, alcohol consumption, and psychopharmaceutical use provided. |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Kilic et al., 2021 | Belgium | Females (253)  Males (89) | To analyze the respective importance of risk and protective factors on academic burnout among medical students. | A cross-sectional study design | Voluntary Sampling | 342 participants | 21.7 years | * Significant gender differences were found in emotional exhaustion, with women displaying higher scores than men. * Significant year of study differences were found in emotional exhaustion and cynicism domains, but not in academic effectiveness. * The study highlighted the importance of risk and protective factors in understanding academic burnout among medical students. |
| **Author/Year** | **Country** | **Gender** | **Study Aim** | **Study Design** | **Sampling Type** | **Sampling Size** | **Mean Age** | **Key Findings** |
| Kathmandu et al., 2021 | Nepal | Was not mentioned | To determine the prevalence of burnout among medical students and to investigate its association with age, gender, and year of study | A cross-sectional study design | Stratified sampling | 239 participants | Not stated | * The prevalence of burnout among medical students was 65.9%. * No significant association was found between burnout and age, gender, or year of study. * The study highlighted the necessity of implementing effective strategies for the mental well-being of future physicians |

**2.6 Study Settings and Design**

Eight (8) quantitative studies were conducted in seven (7) different countries, which include: Brazil (Barbosa et al., 2018) (Prata et al., 2021) , Cyprus (Nteveros et al., 2020), Uganda (Kajjimu et al., 2021), Saudi Arabia (Mahfouz et al., 2020), Spain (Capdevila-Gaudens et al., 2021), Belgium (Kilic et al., 2021) and Nepal (Shrestha et al., 2021). All eight (8) articles reviewed adopted a cross-sectional design for the study among medical students to determine the prevalence of burnout among medical students.

**2.7 Study Ethics** Every article examined in the review had ethical approval. Prior to commencing data collection, ethical clearance was obtained from the respective institution’s ethical review boards. Participants were guaranteed full confidentiality of the information collected.

**2.8 Study Results**

The results from the included studies were grouped into four themes, namely: Prevalence of emotional exhaustion, Degree of depersonalization, Sense of personal accomplishments, and Factors associated with burnout.

**2.9 Prevalence of Emotional Burnout**

This theme explores the frequency and intensity of emotional exhaustion experienced by medical imaging students. Emotional exhaustion refers to feelings of being emotionally drained and depleted due to prolonged stress and workload. A study found that 36.8% of medical students had high burnout, defined as high scores for two of its components (exhaustion and cynicism). The percentage of high burnout increased progressively from the 1st year (23%) to the 6th year (45%) of the medical degree course. Additionally, burnout risk was significantly more prevalent among 6th-year students (37.5%) compared to those in their 3rd year of training (14.8%). The study also noted that burnout scores increased after the 1st year of the medical degree, with the highest scores found in the 5th year (Capdevila-Gaudens et al., 2021). Again, another study found that the students showed high scores only in emotional exhaustion, with a frequency of 63.2% (Barbosa et al., 2018). This indicates that emotional exhaustion is a significant aspect of burnout among medical imaging students whose schedules are similar to that of medical students in the study.

**2.10 Degree of Depersonalization**

Depersonalization involves developing a skeptical or disengaged attitude towards patients, which can result from prolonged exposure to stress and burnout. Depersonalization is characterized by a negative, cynical, and detached response to people, including colleagues and supervisors. It is part of the triad of burnout symptoms, along with emotional exhaustion and reduced personal accomplishment (Nteveros et al., 2020). The study found that students with burnout had higher levels of depersonalization, indicating a negative and detached attitude towards their work or studies.

**2.11 Sense of Personal Accomplishment**

This theme explores medical student’s perceptions of competence, achievement, and fulfillment in their academic and clinical endeavors. Decreased sense of personal accomplishment is a significant aspect of burnout experienced by individuals exposed to chronic professional stressors. Additionally, the research findings suggest that age can be a positive predictor of academic effectiveness, as older individuals may experience an increase in their feeling of competence in academic settings (Kilic et al., 2021).

**2.12 Factors contributing to Burnout**

This theme involves identifying various stressors, challenges, and risk factors that contribute to burnout among medical students. Intrinsic factors such as being optimistic about their future career, feeling fulfilled and happy at work, feeling satisfied with medicine as their career choice, feeling motivated with their career studies and having ever developed thoughts of dropping out of school.

These intrinsic factors shed light on the complex interplay between personal attitudes, motivations and experiences in the development of burnout among medical imaging students (Kajjimu et al., 2021). Also, external factors such as an exhaustion day-to-day routine of studies, the challenge of commuting long distance, insufficient leisure time, and considering oneself important to family members were associated with burnout among medical students at Mbarara University of Science and Technology (Kajjimu et al., 2021).

These external factors suggest that the demands of the academic curriculum, long commuting distance, lack of personal time for relaxation or leisure activities, and the pressure meeting family expectations can contribute to the development of burnout among medical students. These findings highlight the importance of considering external and intrinsic factors when addressing burnout in medical education.

**2.13 Study Recommendations**

All of the research studies that were reviewed focused on the prevalence of medical students in general. None of the studies specifically examined the prevalence of burnout among medical imaging students. This suggested that there’s a gap in the research literature that needs to be addressed.

Moreover, the study recommends tailored stress management programs and fostering supportive environments to address burnout among medical imaging students. Enhancing students' sense of personal accomplishment through mentoring and recognition is crucial, alongside addressing external stressors like long commutes and familial expectations (Kajjimu et al., 2021). Promoting work-life balance through leisure activities and personal time is essential for rejuvenation. Establishing mechanisms for regular monitoring of burnout levels enables timely interventions. These strategies aim to create a supportive environment that mitigates emotional exhaustion, fosters resilience, and promotes student well-being and academic success.

**2.14 Conclusion**

The literature review delves into burnout among medical imaging students, revealing significant emotional exhaustion prevalence, depersonalization, and diminished personal accomplishment. Findings indicate a high burnout percentage, particularly in later years, highlighting the enduring impact of stress. Depersonalization and reduced personal accomplishment contribute to the multifaceted nature of burnout. Intrinsic factors like career satisfaction and external stressors such as long commutes and family pressure further exacerbate burnout. Addressing these complexities is crucial for effective intervention in medical education.

# CHAPTER THREE

# METHODOLOGY

# 3.1 Overview

The scope of this chapter will comprise the various methods which will be employed to assess the prevalence of burnout among medical imaging students at the Ghanaian universities. Research methodology can be understood as the systematic framework that guides researchers in identifying research problems, formulating hypotheses, collecting and analyzing data, and interpreting results (Mertens, 2015). Research methods comprise mainly of three elements: (a) the forms of data collection; (b) analysis; and (c) interpretation that the researchers propose for their studies (Abutabenjeh & Jaradat 2018).

## **3.2 Study design**

This is a cross-sectional quantitative study design that was conducted in June and July 2024. It involved medical imaging students at the Ghanaian universities from 2nd year to 4th year of study.

Quantitative study involves formation of hypothesis from collected data, analyzing and using the data from the study to draw conclusions to validate or nullify a hypothesis (Barroga & Matanguihan 2022). Quantitative data was employed to enable effective measuring and assessment of prevalence of burnout.

**3.3 Setting**

The study was conducted among medical imaging students at the Ghanaian public universities, Kwame Nkrumah University of Science and Technology (KNUST) located in Kumasi, the Ashanti Regional Capital of Ghana, University of Ghana (Legon) located in Accra, the Greater Accra Regional Capital of Ghana, University of Cape Coast (UCC) located in Cape Coast, the Central Regional Capital of Ghana, University for Development Studies (UDS) located in Tamale, the Northern Regional Capital of Ghana, University of Health and Allied Sciences (UHAS) located in Ho, the Volta Regional Capital of Ghana and College of Health and Well-Being, located in Kintampo in the Bono East Regional Capital of Ghana. The data was collected through online questionnaires.

## **3.4 Study site**

The study was conducted in Ghanaian public universities within Kumasi, the Ashanti Regional Capital of Ghana, Greater Accra Regional Capital of Ghana, Cape Coast in the Central Regional Capital of Ghana, Tamale in the Northern Regional Capital of Ghana, Ho in the Volta Regional Capital of Ghana and Kintampo in the Bono East Regional Capital of Ghana.

**3.5 Participants**

The participants of this study were medical imaging students in the Ghanaian public universities from 2nd year to 4th. This aims to provide a clearer understanding of the prevalence of burnout among medical imaging students at Ghanaian public universities.

**3.6 Eligibility Criteria**

* **Inclusion criteria**

Medical imaging students currently enrolled in the 2nd to 4th year at Ghanaian public universities.

* **Exclusion criteria**

Students not willing to participate or not available during the data collection period.

This will guarantee a more homogeneous participant group and consistent professional experience, thereby enhancing internal validity.

**3.7 Study Sample Size**

The sample size of this study consists of 261 participants studying medical imaging at the Ghanaian public universities which were obtained through the online questionnaires distributed using a convenient sampling method.

n=

population Size (N): 802, Z-score = 1.96, Margin of Error (E): (0.05), estimated proportion (p): 0.5

802=

n=260.7

A sample size of approximately 261 study subjects was calculated based on sample frame of 802.

## **3.8 Data collection**

In conducting the study, data collection was mainly through the use of set of comprehensive questionnaires. The questionnaires sought such information as socio demographics characteristics such as gender, age, level of study, religious affiliation, location, ethnicity, study financing, and medications intake due to studies. Other information that was elicited from the participants included the desired profession, their emotional exhaustion, and cynicism. Additional information collected was the academic efficacy.

## **3.9 Statistical analysis**

All the participants were divided into four groups by age: 17-20 years, 21-23 years, 24-27 years, and 28 years and above. Statistical analyses were performed with SPSS version 26. Before analysis, the data was organized and coded using Microsoft Excel software to ensure coherence and accuracy. Descriptive statistical analysis was used to examine the demographic variables such as gender, age, level of study, location, ethnicity and religious affiliation (BMI). Categorical data were summarized into frequencies and proportions.

The distribution of continuous data was assessed statistically. Normally distributed data were reported as means with standard deviations (SD), while medians with interquartile ranges (IQR) were used for reporting. The relationship between variables was considered positive when the Pearson correlation (r) was greater than zero. A p-value of less than 0.05 was considered significant. Binary logistic regression analysis was used to assess the socio-demographic factors associated with Emotional Exhaustion, Cynicism and Academic Efficacy. The outcomes of the analysis were effectively presented through the use of tables and figures to enhance the clarity of the study's findings.

**3.10 Ethical Considerations**:

Ethical approval was obtained from the Ghanaian universities’ Ethics Committee. Approval was also sought from the head of the facility or the radiology department of the selected data collection sites before the study proceeded. Informed consent was sorted from participants, ensuring they were aware of the study’s purpose and their right to withdraw at any time. Their responses were kept confidential and used only for the purposes of this study.

## **3.11 Data storage and protection**

Different codes were generated for participants for identification purposes. Participant names and personal details were kept anonymous. Data collected for this research will be kept for at least four (4) years.

## **3.12 Confidentiality**

The information that was collected in this research study were handled with strict confidentiality, and the gathered information was exclusively utilized for research purposes.

## **3.13 Dissemination of findings**

The research procedures were meticulously followed to ensure meaningful outcomes. The results will be systematically organized and documented for public access. Moreover, given the opportunity, they will be disseminated to diverse academic and healthcare institutions, as well as presented at workshops, seminars, and other academic forums. Consideration will also be given to submitting them for online publication to benefit future researchers and the global community at large.

## **3.14 Bias**

There may be response bias where the students will give answers to please the researcher and provide socially desirable responses so measures were taken to maintain anonymity and confidentiality of responses, thus reminders were sent to improve response rates, and anonymity was be ensured to encourage truthful reporting. All eligible students will be invited to participate to ensure a representative sample to mitigate selection bias.

**CHAPTER FOUR**

**RESULTS**

**4.0 Overview**

This section presents the findings from the data collection and analysis regarding the prevalence of burnout among medical imaging students at Ghanaian public universities. Descriptive statistics were used to analyze the socio-demographic characteristics, while inferential statistics, including chi-square tests, were employed to identify significant associations between demographic factors and burnout prevalence. Additionally, binary logistic regression analysis was performed to explore the factors influencing burnout across different student groups. All statistical analyses were conducted using SPSS, with significance levels set at p < 0.01 and p < 0.05.

**4.1 Socio-Demographic Characteristics of the Respondents**

The socio-demographic data gathered from the respondents include various attributes such as gender, age, and the university of study, academic level, religious affiliation, and geographic location was collected. The data also cover aspects such as the source of their study funding, any medication intake related to their academic activities, and their level of interest in pursuing a career in medical imaging.

**4.11 Gender Distribution**

The gender distribution of the respondents revealed that 51.2% (n=192) were male, while 48.8%

(n=183) were female (See in **Table 4.0**).

**Table 4.0: Gender distribution**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Gender** |  |  |
| Male | 192 | 51.2 |
| Female | 183 | 48.8 |

**4.12 Age Group**

The age distribution of the study respondents revealed that the largest proportion, 43.3% (n=162), fell within the 21–23-year age range, followed by 26.7% (n=100) in the 24–27-year range, and 23.2% (n=87) in the 17–20-year range. The smallest group consisted of respondents aged 28 years and older, making up 6.9% (n=26). This distribution showed significant variation (p<0.001), as detailed in **Figure 4.0** below.

**Figure 4.0: the distribution of age group**

**4.1.3 University of Study**

Overall, 26.7% (n=100) are from College of Health and Well-being Kintampo, 21.0% (n=79) are from University of Ghana. Study participants from University of Cape Coast, University of Health and Allied Sciences, University of Developmental Studies, accounts for 18.9% (n=71), 17.3% (n=65), and 16.0% (n=60) respectively. Number of participants from College of Health and Well-being were significantly different from other universities respondents (p< 0.001), as detailed in **Figure 4.1** below.

**Figure 4.1. shows the distribution of the university of study**

**4.1.4 Academic Level**

The distribution of respondents by academic level revealed that the majority were at Level 400, comprising 40.3% (n=151) of the sample. This was followed by 31.2% (n=117) at Level 300 and 28.5% (n=107) at Level 200. The Chi-square test confirmed that this variation in academic levels is statistically significant (p<0.001). It is illustrated in a table below.

**Table 4.1: the Academic Level**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Academic Level** |  |  |
| 200 | 107 | 28.5 |
| 300 | 117 | 31.2 |
| 400 | 151 | 40.3 |

**4.1.5 Religious affiliation**

The majority of the study respondents identified as Christians, comprising 89.6% (n=336) of the sample, while 10.4% (n=39) identified as Muslims. The results for religious affiliation revealed a statistically significant difference in the distribution of religious groups (p < 0.001). The distribution is illustrated in **Table 4.2** below.

**Table 4.2: the distribution for religious affiliation**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Religion** |  |  |
| Christian | 336 | 89.6 |
| Muslim | 39 | 10.4 |

**4.1.6 Location of Hostel**

The geographical distribution showed that most of the respondents were staying off campus 63.2% (n=237) with the remaining respondents 36.8% (n=138) staying on campus. There was a significant difference in number among the various locations (p< 0.001). (See **Table 4.3**).

**Table 4.3: Location of hostel**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Location** |  |  |
| On campus | 138 | 36.8 |
| Off campus | 237 | 63.2 |

**4.1.7 Ethnicity**

The ethnic distribution revealed that the majority of respondents were Akan, constituting 36.8% (n=138) of the sample. This was followed by Ga 23.2% (n=87), those categorized as Others at 22.7% (n=85), and Ewe at 17.3% (n=65). This distribution shows a significant variation among the different ethnic groups (p<0.001). This is illustrated in **Figure 4.2**

**Figure 4.2: the distribution for Ethnicity**

**4.1.8 Study Financing**

The distribution of study financing revealed that the majority of respondents relied on family support, comprising 79.5% (n=298). Scholarships were used by 12.8% (n=48) of respondents, while loans accounted for 4.0% (n=15), and self-funding was reported by 3.7% (n=14). This distribution shows a significant variation in financing sources (p<0.001). The distribution is shown in table 4.4 below

**Table 4.4: the distribution for study financing**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Study Financing** |  |  |
| Scholarship | 48 | 12.8 |
| Family | 298 | 79.5 |
| Loan | 15 | 4.0 |
| Self | 14 | 3.7 |
|  |  |  |

**4.1.9 Medications intake due to Study**

The distribution of medication intake due to studies indicated that most respondents reported using medication sometimes, constituting 45.9% (n=172). This was closely followed by those who never took medication, at 45.1% (n=169), while 9.1% (n=34) reported frequent use. This distribution reflects notable variation in medication usage among respondents. The differences in the distribution are statistically significant (p<0.001). This is represented in figure 4.3 below.

**Figure 4.3: the distribution for medications intake due to study**

**4.1.10 Preference for Medical Imaging as a Desired Profession**

The preference for medical imaging as a desired profession was overwhelmingly in favor of radiography, with 94.1% (n=353) of respondents indicating that it is their desired profession. In contrast, only 5.9% (n=22) of respondents did not choose radiography as their preferred field. The vast majority of respondents have a strong preference for radiography, and the difference in responses is highly significant (p<0.001). This is illustrated in table 4.4

**Table 4.5: the preference for medical imaging as a desired profession**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Frequency (n=375)** | **Percentage (%)** |
| **Is Radiography Your Desired Profession** |  |  |
| No | 22 | 5.9 |
| Yes | 353 | 94.1 |

**4.2 Comparative Analysis of Socio-Demographic Profiles Among Five Universities**

This analysis examines socio-demographic differences among students from five universities: COHK, UCC, UDS, UG, and UHAS, focusing on age, gender, academic level, religion, ethnicity, study financing, and medication intake. Notable findings include significant age variations with UDS having the highest percentage of older students (≥28 years, 23.3%), a near-significant gender disparity with COHK having more male students (62.0%), and substantial differences in academic levels with UDS having the highest proportion at the 400 level (98.6%). Religion shows significant variation (p = 0.004), particularly with UDS having more Muslim students (23.3%), and location preferences reveal significant differences (p = 0.005), with UDS having the most students living off-campus (80.0%). Study financing also varies significantly (p = 0.007), with UHAS leading in scholarships (23.1%). These findings highlight diverse student profiles and experiences across the universities. This is represented in a table below

**Table 4.6: comparative analysis of socio-demographic profiles among Five universities**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Overall (n=375)** | **University of study** | | | | |  |
| **Age Group (Years)** |  | **COHK (n=100)** | **UCC (n=71)** | **UDS (n=60)** | **UG (n=79)** | **UHAS (n=65)** | **p-value** |
| 17-20 | 87 (23.2) | 22 (22.0) | 11 (15.5) | 0 (0.0) | 26 (32.9) | 28 (43.1) | 0.000 |
| 21-23 | 162 (43.2) | 36 (36.0) | 37 (52.1) | 26 (43.3) | 38 (48.1) | 25 (38.5) |  |
| 24-27 | 100 (26.7) | 32 (32.0) | 22 (31.0) | 20 (33.3) | 14 (17.7) | 12 (19.5) |  |
| ≥ 28 | 26 (6.9) | 10 (10.0) | 1 (1.4) | 14 (23.3) | 1 (1.3) | 0 (0.0) |  |
| **Gender** |  |  |  |  |  |  |  |
| Male | 192 (51.2) | 62 (62.0) | 29 (40.8) | 31 (51.7) | 35 (44.3) | 35 (53.8) | 0.052 |
| Female | 183 (48.8) | 38 (38.0) | 42 (59.2) | 29 (48.8) | 44 (55.7) | 30 (46.2) |  |
| **Academic Level** |  |  |  |  |  |  |  |
| 200 | 107 (28.5) | 41 (41.0) | 14 (19.7) | 1 (1.7) | 32 (40.5) | 19 (29.2) | 0.000 |
| 300 | 117 (31.2) | 59 (59.0) | 20 (28.2) | 0 (0.0) | 18 (22.8) | 20 (30.8) |  |
| 400 | 151 (40.3) | 0 (0.0) | 37 (52.1) | 59 (98.6) | 29 (36.7) | 26 (40.0) |  |
| **Religion** |  |  |  |  |  |  |  |
| Christian | 336 (89.6) | 90 (90.0) | 66 (93.0) | 46 (76.7) | 76 (96.2) | 58 (89.2) | 0.004 |
| Muslim | 39 (10.4) | 10 (10.0) | 5 (7.0) | 14 (23.3) | 3 (3.8) | 7 (10.8) |  |
| **Location** |  |  |  |  |  |  |  |
| On campus | 138 (36.8) | 40 (40.0) | 20 (28.2) | 12 (20.0) | 36 (45.6) | 30 (46.2) | 0.005 |
| Off campus | 237 (63.2) | 60 (60.0) | 51 (71.8) | 48 (80.0) | 43 (54.4) | 35 (53.8) |  |
| **Ethnicity** |  |  |  |  |  |  |  |
| Akan | 138 (36.8) | 33 (33.0) | 36 (50.7) | 21 935.0) | 30 (38.0) | 18 (27.7) | 0.000 |
| Ewe | 65 (17.3) | 19 (19.0) | 8 (11.3) | 9 (15.0) | 5 (6.3) | 24 (36.9) |  |
| Ga | 87 (23.2) | 21 (21.0) | 15 (21.1) | 8 (13.3) | 32 (40.5) | 11 (16.9) |  |
| Others | 85 (22.7) | 27 (27.0) | 12 (16.9) | 22 (36.7) | 12 (15.2) | 12 (18.5) |  |
| **Study Financing** |  |  |  |  |  |  |  |
| Scholarship | 48 (12.8) | 13 (13.0) | 6 (8.5) | 7 (11.7) | 7 (8.9) | 15 (23.1) | 0.007 |
| Family | 298 (79.7) | 73 (73.0) | 64 (90.1) | 45 (75.0) | 68 (86.1) | 48 (73.8) |  |
| Loan | 15 (4.0) | 9 (9.0) | 1 (1.4) | 3 95.0) | 1 (1.3) | 1 (1.5) |  |
| Self | 14 (3.7) | 5 (5.0) | 0 (0.0) | 5 (8.3) | 3 (3.8) | 1 (1.5) |  |
| **Medications Intake Due to Studies** |  |  |  |  |  |  |  |
| Never | 169 (45.1) | 52 (52.0) | 34 (47.9) | 20 (33.3) | 37 (46.8) | 26 (40.0) | 0.028 |
| Sometimes | 172 (45.8) | 34 (34.0) | 36 (50.7) | 34 (56.7) | 37 (46.8) | 31 (47.7) |  |
| Frequently | 34(9.1) | 14 (14.0) | 1 (1.4) | 6 (10.0) | 5 (6.3) | 8 (12.3) |  |
| **Is Radiography Your Desired Profession** |  |  |  |  |  |  |  |
| No | 22 (5.9) | 0 (0.0) | 1 (1.4) | 0 (0.0) | 18 (22.8) | 3 (4.6) | 0.000 |
| Yes | 353 (94.1) | 100 (100.0) | 70 (98.6) | 60 (100.0) | 61 (77.2) | 62 (95.4) |  |

**4.3 Emotional Exhaustion**

Respondents reported varying degrees of emotional exhaustion related to their studies. This was assessed using the frequency, mean and standard deviation. The mean score for feeling emotionally drained by their studies was 4.97 (±1.50). Feeling used up at the end of the day at school had a mean score of 4.85 (±1.41). Many respondents felt like their courses were breaking them down, with a mean score of 4.92 (±1.45). Frustration from course activities had a mean score of 4.86 (±1.46), while the strain of studying or attending class had the highest mean score of 5.02 (±1.46). These scores reflect a significant level of emotional exhaustion among the participants (see **Table 4.7**).

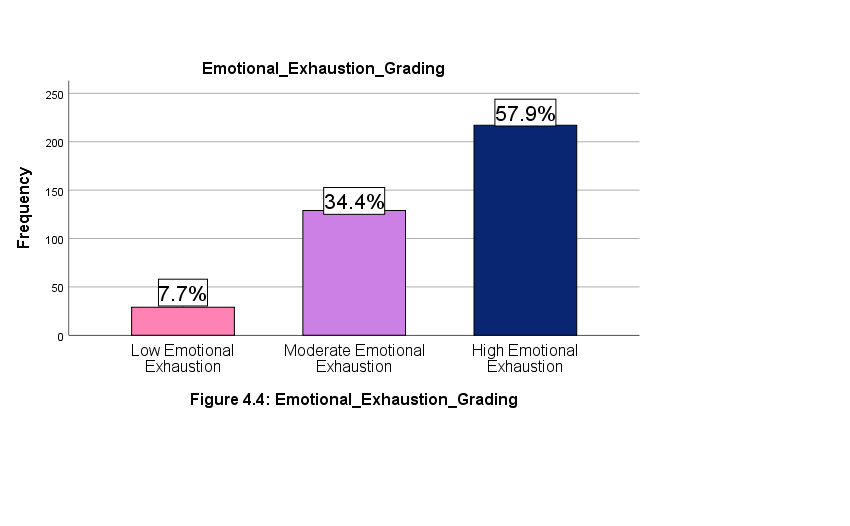
**Table 4.7: the distribution frequency, mean scores, and standard deviations Emotional Exhaustion**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **Mean** | **Standard Deviation** |  |
| **Emotional Exhaustion** |  |  |  |  |  |  |  |  |  |  |
| I feel emotionally drained by my studies | 6(1.6) | 10 (2.7) | 14 (3.7) | 38 (10.1) | 40 (10.7) | 49 (13.1) | 218 (58.1) | 4.97 | ±1.50 |  |
| I feel used up at the end of the day at school | 6 (1.6) | 9 (2.4) | 16 (4.3) | 30 (8.0) | 41 (10.9) | 116 (30.9) | 157 (41.9) | 4.85 | ±1.41 |  |
| I feel like my courses are breaking me down | 6 (1.6) | 9 (2.4) | 14 (3.7) | 29 (7.7) | 55 (14.7) | 70 (18.7) | 192 (51.2) | 4.92 | ±1.45 |  |
| I feel frustrated by my course activities | 6 (1.6) | 9 (2.4) | 14 (3.7) | 43 (11.5) | 35 (9.3) | 92 (24.5) | 178 (46.9) | 4.86 | ±1.46 |  |
| I feel studying or attending a class is really a strain on me | 6 (1.6) | 9 (2.4) | 14 (3.7) | 28 (7.5) | 45 (12.0) | 55 (14.7) | 218 (58.1) | 5.02 | ±1.46 |  |

Data presented mean and standard deviation (**±)**, 0 = Never, 1 = Rarely, 2 = Mild, 3 = Sometimes, 4 = Often, 5 = Very Oten, 6 = Always.

The assessment of the prevalence of emotional exhaustion was based on responses to the five set of questions, each with a maximum score of 6, resulting in a total possible score of 30. These scores were categorized into three groups: individuals scoring between 0 and 10 were classified as experiencing low emotional exhaustion, those scoring between 11 and 20 were classified as experiencing moderate emotional exhaustion and those scoring between 21 and 30 were classified as experiencing high emotional exhaustion (**≥70%)**, indicating a higher level of emotional distress, i.e. 21/30 \* 100% = 70%

The analysis of emotional exhaustion among the 375 participants revealed that 57.9% experienced high emotional exhaustion, 34.4% experienced moderate emotional exhaustion, and 7.7% reported low emotional exhaustion. This is represented in **figure 4.4** below

****

**4.4 Cynicism**

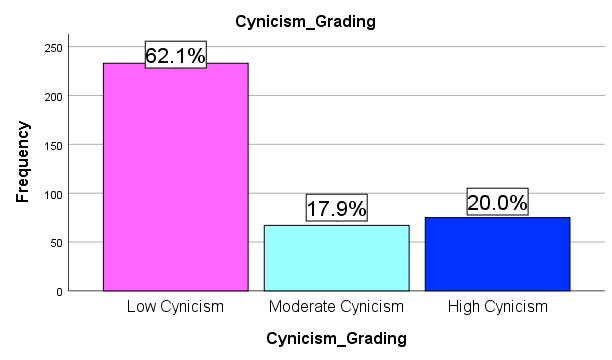
The analysis of cynicism revealed the following mean scores and standard deviations: respondents reported a mean score of 2.59 (±1.98) for becoming less interested in their studies since enrollment, 2.56 (±1.85) for decreased enthusiasm about their studies, 2.44 (±1.91) for becoming cynical about the potential usefulness of their studies, and 2.34 (±2.09) for doubting the significance of their studies. Statistical analysis confirmed that these variations in cynicism scores were significant (χ²(3) = 22.47, p < 0.001). This is represented in a table below.

**Table 4.8: the distribution frequency, mean scores, and standard deviations Cynicism**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **Mean** | **Standard Deviation** |  |
|  |
| **Cynicism** | |  |  |  |  |  |  |  |  |  |  |
| I have become less interested in my studies since my enrollment at the school | | 76 (20.3) | 49 (13.1) | 49 (13.1) | 108 (28.8) | 19 (5.1) | 18 (4.8) | 56 (14.9) | 2.59 | ±1.98 |  |
| I have become less enthusiastic about my studies | | 33 (8.8) | 90 (24.0) | 108 (28.8) | 49 (13.1) | 21 (5.6) | 21 (5.6) | 53 (14.1) | 2.56 | ±1.85 |  |
| I have become cynical about the potential usefulness of my studies | | 43 (11.5) | 108 (28.8) | 84 (22.4) | 48 (12.8) | 17 (4.5) | 22 (5.9) | 53 (14.1) | 2.44 | ±1.91 |  |
| I doubt significance of my studies | | 110 (29.3) | 43 (11.5) | 51 (13.6) | 79 (21.1) | 19 (5.1) | 19 (5.1) | 54 (14.4) | 2.34 | ±2.09 |  |

Data presented mean and standard deviation (**±)**, 0 = Never, 1 = Rarely, 2 = Mild, 3 = Sometimes, 4 = Often, 5 = Very Oten, 6 = Always.

The analysis of cynicism was assessed through four set of questions, each with a maximum score of 6, leading to a total possible score of 24. The degree of cynicism was categorized as follows: low cynicism with scores ranging from 0 to 8, moderate cynicism with scores ranging from 9 to 16, and high cynicism with scores ranging from 17 to 24. The majority, 62.1%, exhibited low cynicism, 17.9% had moderate cynicism, and 20.0% reported high cynicism (See **Figure 4.5**).

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**Figure 4.5: the degree of cynicism among study respondents**

**4.5 Academic Efficacy**

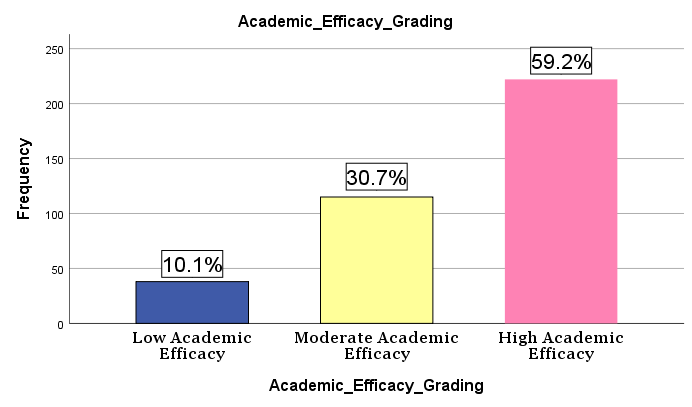
The data on Academic Efficacy, as analyzed through SPSS, reveals generally low levels of perceived academic efficacy among participants. All items were reverse coded, meaning that higher scores on the original scale indicated lower levels of academic efficacy, and vice versa. Participants generally reported low levels of academic efficacy across all items. For instance, when asked about their ability to solve problems that arise in their studies, most participants rated themselves at the lowest end of the scale, with a mean score of 1.63 and a standard deviation of ±1.74. Similarly, confidence in contributing effectively to classes was rated slightly higher, with a mean score of 1.71 and a standard deviation of ±1.52. Participants also perceived themselves as good students with a mean score of 1.64 (±1.50), and they felt they had learned interesting things from their courses, with a mean score of 1.64 (±1.58). The sense of stimulation from achieving study goals had a mean score of 1.58 (±1.57), and confidence in classroom effectiveness was the highest among the items, with a mean score of 1.54 and a standard deviation of ±1.63. Overall, the data reflect a trend of low academic efficacy among participants (See **Table 4.9**).

**Table 4.9: reverse-coded responses and mean scores for Academic Efficacy**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **Mean** | **Standard Deviation** |  |
| **Academic Efficacy** |  |  |  |  |  |  |  |  |  |  |
| I can effectively solve the problems that arise in my studies | 161 (42.9) | 41 (10.9) | 37 (9.9) | 88 (23.5) | 17 (4.5) | 22 (5.9) | 9 (2.4) | 1.63 | ±1.74 |  |
| I believe that I can effectively contributed to classes that I attend | 93 (24.8) | 112 (29.9) | 64 (17.1) | 49 (13.1) | 39 (10.4) | 11 (2.9) | 7 (1.9) | 1.71 | ±1.52 |  |
| In my opinion, I am a good student | 111 (29.5) | 78 (20.8) | 89 (23.7) | 58 (15.5) | 39 (10.4) | 15 (4.0) | 7 (1.9) | 1.64 | ±1.50 |  |
| I have learned many interesting things during the courses of my studies | 125 (33.3) | 73 (19.5) | 57 (15.2) | 81 (21.6) | 19 (5.1) | 10 (2.7) | 10 (2.7) | 1.64 | ±1.58 |  |
| I feel stimulated when I achieve my study goals | 124 (33.1) | 86 (22.9) | 69 (18.4) | 47 (12.5) | 25 (6.7) | 18 (4.8) | 6 (1.6) | 1.58 | ±1.57 |  |
| During class I feel confidence that I am effective in getting things done | 139 (37.1) | 77 (20.5) | 59 (15.7) | 54 (14.4) | 19 (5.1) | 17 (4.5) | 10 (2.7) | 1.54 | ±1.63 |  |

The scores of items of reduced academic efficacy were reversed in the analysis. Data presented mean and standard deviation (**±)**, 0=Always, 1=Very often, 2=Often, 3=Sometimes, 4=Mild, 5=Rarely, 6=Never.

The assessment of academic efficacy was based on six questions, each with a maximum score of 6, resulting in a total possible score of 36, which was then categorized into low (scores ranging from 0 to 13), moderate (14 to 25), and high (26 to 36) academic efficacy, showed that 10.1% of the 375 participants fell into the low academic efficacy category, indicating significant challenges in their academic performance. In contrast, 30.7% of participants exhibited moderate academic efficacy, reflecting a moderate level of confidence and competence in their academic abilities. The majority, 59.2%, demonstrated high academic efficacy, signifying strong confidence and effective performance in their academic pursuits (See **Figure 4.6**).



**Figure 4.6: the sense of academic efficacy among study respondents**

**4.6 Socio-demographic factors associated with Emotional Exhaustion**

The analysis of socio-demographic factors associated with emotional exhaustion revealed several significant patterns. Age was a significant factor (p = 0.013), with younger participants aged 17-20 exhibiting the highest levels of emotional exhaustion (23.7%), compared to other age groups. The 21-23 age group also showed notable levels of emotional exhaustion, but less pronounced than the youngest group. Gender did not significantly influence emotional exhaustion levels (p = 0.905), as both male and female participants had similar distributions across the emotional exhaustion categories.

University affiliation was a significant factor (p = 0.011), with students from COHK experiencing the highest prevalence of high emotional exhaustion (24.0%), whereas students from UHAS had the lowest (19.4%). Academic level also significantly impacted emotional exhaustion (p = 0.028), with second-year students reporting a higher level of emotional exhaustion (48.3%) compared to those in the third (20.7%) and fourth years (31.0%).

Location was another significant factor (p = 0.028), with on-campus residents experiencing a higher proportion of high emotional exhaustion (33.9%) compared to their off-campus counterparts (66.1%). Ethnicity also showed significant differences (p = 0.001), with Akan students reporting the highest level of high emotional exhaustion (36.0%), while those from other ethnic backgrounds had varying levels of emotional exhaustion.

Religion did not significantly affect emotional exhaustion levels (p = 0.442). Study financing sources and the frequency of medication intake due to studies were not significantly associated with emotional exhaustion (p = 0.734 and p = 0.786, respectively). Additionally, whether radiography was the desired profession did not show a significant impact on emotional exhaustion levels (p = 0.545). This is shown in **Table 4.10** below

**Table 4.10: Association between socio-demographic characteristics of study respondents and Emotional Exhaustion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Total (n=375)** | **Low Emotional Exhaustion (n=29)** | **Moderate Emotional Exhaustion (n=129)** | **High Emotional Exhaustion (n=217)** | **p value** |
| **Age Group (Years)** |  |  |  |  |  |
| 17-20 | 87 (23.2) | 7 (24.1) | 13 (20.6) | 67 (23.7) | **0.013** |
| 21-23 | 162 (43.2) | 18 (62.1) | 35 (55.6) | 109 (38.5) |  |
| 24-27 | 100 (26.7) | 1 (3.4) | 12 (19.0) | 87 (30.7)) |  |
| ≥ 28 | 26 (6.9) | 3 (10.3) | 3 (4.8) | 20 (7.1) |  |
| **Gender** |  |  |  |  |  |
| Male | 192 (51.2) | 16 (55.2) | 32 (50.8) | 144 (50.9) | 0.905 |
| Female | 183 (48.8) | 13 (44.8) | 31 (49.2) | 139 (49.1) |  |
| **University** |  |  |  |  |  |
| COHK | 100 (26.7) | 13 (44.8) | 19 (30.2) | 68 (24.0) | **0.011** |
| UCC | 71 (18.9) | 5 (17.2) | 11 (17.5) | 55 (19.4) |  |
| UDS | 60 (16.0) | 6 (20.7) | 16 (25.4) | 38 (13.4) |  |
| UG | 79 (21.1) | 5 (17.2) | 7 (11.1) | 67 (23.7) |  |
| UHAS | 65 (17.3) | 0 (0.0) | 10 (15.9) | 55 (19.4) |  |
| **Academic Level** |  |  |  |  |  |
| 200 | 107 (28.5) | 14 (48.3) | 19 (30.2) | 74 (26.1) | **0.028** |
| 300 | 117 (31.2) | 6 (20.7) | 13 (20.6) | 98 (34.6) |  |
| 400 | 151 (40.3) | 9 (31.0) | 31 (49.2) | 111(39.2) |  |
| **Religion** |  |  |  |  |  |
| Christian | 336 (89.6) | 28 (96.6) | 56 (88.9) | 252 (89.0) | 0.442 |
| Muslim | 39 (10.4) | 1 (3.4) | 7 (11.1) | 31 (11.0) |  |
| **Location** |  |  |  |  |  |
| On campus | 138 (36.8) | 17 (58.6) | 25 (39.7) | 96 (33.9) | **0.028** |
| Off campus | 237 (63.2) | 12 (41.4) | 38 (60.3) | 187 (66.1) |  |
| **Ethnicity** |  |  |  |  |  |
| Akan | 138 (36.8) | 18 (62.1) | 18 (28.6) | 102 (36.0) | **0.001** |
| Ewe | 65 (17.3) | 5 (17.2) | 16 (25.4) | 44 (15.5) |  |
| Ga | 87 (23.2) | 5 (17.2) | 7 (11.1) | 75 (26.5) |  |
| Others | 85 (22.7) | 1 (3.4) | 22 (34.9) | 62 (21.9) |  |
| **Study Financing** |  |  |  |  |  |
| Scholarship | 48 (12.8) | 5 (17.2) | 5 (7.9) | 38 (13.4) | 0.734 |
| Family | 298 (79.5) | 23 (79.3) | 54 (85.7) | 221 (78.1) |  |
| Loan | 15 (4.0) | 1 (3.4) | 2 (3.2) | 12 (4.2) |  |
| Self | 14 (3.7) | 0 (0.0) | 2 (3.2) | 12 (4.2) |  |
| **Medications Intake Due to Studies** |  |  |  |  |  |
| Never | 169 (45.1) | 15 (51.7) | 27 (42.9) | 127 (44.9) | 0.786 |
| Sometimes | 172 (45.9) | 11 (37.9) | 32 (50.8) | 129 (45.6) |  |
| Frequently | 34 (9.1) | 3 (10.3) | 4 (6.3) | 27 (9.5) |  |
| **Is Radiography Your Desired Profession** |  |  |  |  |  |
| No | 22 (5.9) | 3 (10.3) | 3 (4.8) | 16 (5.7) | 0.545 |
| Yes | 353 (94.1) | 26 (89.7) | 60 (95.2) | 267 (94.3) |  |

The data are displayed as frequencies (%). Chi-square p-values are reported, with p*˂* 0.05 considered statistically significant. P-values highlighted in bold are those that are statistically significant.

**4.7 Socio-demographic factors associated with Cynicism**

The analysis of socio-demographic factors associated with cynicism highlighted a few significant trends. Age emerged as a significant factor (p = 0.04), with individuals aged 17-20 exhibiting the highest levels of high cynicism (28.0%), compared to other age groups. This was in contrast to the 24-27 age group, which had a lower proportion of high cynicism (18.7%). Gender did not show a significant effect on cynicism levels (p = 0.405), as both males and females were similarly distributed across the categories of cynicism.

University affiliation was significant (p = 0.046), with students from COHK reporting the highest levels of high cynicism (40.0%), while those from UCC had the lowest (12.0%). Academic level also significantly impacted cynicism (p = 0.011), with second-year students exhibiting the highest levels of moderate and high cynicism (38.8% and 38.7%, respectively), compared to those in the third and fourth years.

Religion did not significantly influence cynicism (p = 0.876), with both Christian and Muslim students having similar proportions in each cynicism category. Location was marginally significant (p = 0.09), with on-campus residents showing a slightly higher proportion of high cynicism (45.3%) compared to off-campus students (54.7%). Ethnicity did not significantly affect cynicism levels (p = 0.149), as there was no clear pattern across different ethnic groups.

Study financing sources and frequency of medication intake due to studies were not significantly associated with cynicism (p = 0.321 and p = 0.21, respectively). Additionally, whether radiography was the desired profession did not show a significant impact on cynicism levels (p = 0.642). It is illustrated in **Table 4.11** below.

**Table 4.11: Relationship Between Socio-Demographic Characteristics and Cynicism Among Study Respondents**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Total (n=375)** | **Low Cynicism (n=233)** | **Moderate Cynicism (n=67)** | **High Cynicism (n=75)** | **p value** |  |
| **Age Group (Years)** |  |  |  |  | **0.04** |  |
| 17-20 | 87 (23.2) | 53 (22.7) | 13 (19.4) | 21 (28.0) |  |  |
| 21-23 | 162 (43.2) | 93 (39.9) | 38 (56.7) | 31 (41.3) |  |  |
| 24-27 | 100 (26.7) | 72 (30.9) | 14 (20.9) | 14 (18.7) |  |  |
| ≥ 28 | 26 (6.9) | 15 (6.4) | 2 (3.0) | 9 (12.0) |  |  |
| **Gender** |  |  |  |  | 0.405 |  |
| Male | 192 (51.2) | 113 (48.5) | 37 (55.2) | 42 (56.0) |  |  |
| Female | 183 (48.8) | 120 (51.5) | 30 (44.8) | 33 (44.0) |  |  |
| **University** |  |  |  |  | **0.046** |  |
| COHK | 100 (26.7) | 49 (21.0) | 21 (31.3) | 30 (40.0) |  |  |
| UCC | 71 (18.9) | 52 (22.3) | 10 (14.9) | 9 (12.0) |  |  |
| UDS | 60 (16.0) | 38 (16.3) | 13 (19.4) | 9 (12.0) |  |  |
| UG | 79 (21.1) | 55 (23.6) | 10 (14.9) | 14 (18.7) |  |  |
| UHAS | 65 (17.3) | 39 (16.7) | 13 (19.4) | 13 (17.3) |  |  |
| **Academic Level** |  |  |  |  | **0.011** |  |
| 200 | 107 (28.5) | 52 (22.3) | 26 (38.8) | 29 (38.7) |  |  |
| 300 | 117 (31.2) | 79 (33.9) | 15 (22.4) | 23 (30.7) |  |  |
| 400 | 151 (40.3) | 102 (43.8) | 26 (38.8) | 23 (30.7) |  |  |
| **Religion** |  |  |  |  | 0.876 |  |
| Christian | 336 (89.6) | 209 (89.7) | 59 (88.1) | 68 (90.7) |  |  |
| Muslim | 39 (10.4) | 24 (10.3) | 8 (11.9) | 7 (9.3) |  |  |
| **Location** |  |  |  |  | **0.09** |  |
| On campus | 138 (36.8) | 76 (32.6) | 28 (41.8) | 34 (45.3) |  |  |
| Off campus | 237 (63.2) | 157 (67.4) | 39 (58.2) | 41 (54.7) |  |  |
| **Ethnicity** |  |  |  |  | 0.149 |  |
| Akan | 138 (36.8) | 91 (39.1) | 20 (29.9) | 27 (36.0) |  |  |
| Ewe | 65 (17.3) | 38 (16.3) | 14 (20.9) | 13 (17.3) |  |  |
| Ga | 87 (23.2) | 59 (25.3) | 10 (14.9) | 18 (24.0) |  |  |
| Others | 85 (22.7) | 45 (19.3) | 23 (34.3) | 17 (22.7) |  |  |
| **Study Financing** |  |  |  |  | 0.321 |  |
| Scholarship | 48 (12.8) | 27 (11.6) | 6 (9.0) | 15 (20.0) |  |  |
| Family | 298 (79.50 | 186 (79.8) | 58 (86.6) | 54 (72.0) |  |  |
| Loan | 15 (4.0) | 10 (4.3) | 1 (1.5) | 4 (5.3) |  |  |
| Self | 14 (3.7) | 10 (4.3) | 2 (3.0) | 2 (2.7) |  |  |
| **Medications Intake Due to Studies** |  |  |  |  | 0.21 |  |
| Never | 169 (45.1) | 98 (42.1) | 35 (52.2) | 36 (48.0) |  |  |
| Sometimes | 172 (45.9) | 114 (48.9) | 29 (43.3) | 29 (38.7) |  |  |
| Frequently | 34 (9.1) | 21 (9.0) | 3 (4.5) | 10 (13.3) |  |  |
| **Is Radiography Your Desired Profession** |  |  |  |  | 0.642 |  |
| No | 22 (5.9) | 13 (5.6) | 3 (4.5) | 6 (8.0) |  |  |
| Yes | 353 (94.1) | 220 (94.4) | 64 (95.5) | 69 (92.0) |  |  |

The data are displayed as frequencies (%). Chi-square p-values are reported, with p*˂* 0.05 considered statistically significant. P-values highlighted in bold are those that are statistically significant.

**4.7 Socio-demographic factors associated with Academic Efficacy**

The analysis of academic efficacy, categorized into low, moderate, and high levels, revealed significant variations based on several socio-demographic factors. Age groups showed a noteworthy difference (p **<** 0.001), with the 21-23 age group exhibiting higher moderate academic efficacy, while those aged 24-27 demonstrated a higher prevalence of high academic efficacy. Gender did not significantly influence academic efficacy (p = 0.667), as both males and females exhibited similar distributions across efficacy categories. University affiliation, however, was significantly associated with academic efficacy (p **<** 0.001), with students from COHK and UHAS having notable variations in academic efficacy levels. Academic level also showed a significant correlation (p = 0.014), with students at the 200-level demonstrating higher low academic efficacy compared to those at 300 and 400 levels, who showed better academic efficacy overall. Religion did not significantly affect academic efficacy (p = 0.369), nor did study financing methods (p = 0.537). Notably, location (p = 0.035) and ethnicity (p = 0.019) revealed significant associations, with on-campus students and those of Akan ethnicity showing different patterns in academic efficacy compared to their off-campus and other ethnic counterparts. Medications intake due to studies and whether radiography was the desired profession did not show significant associations with academic efficacy (p = 0.265 and p = 0.13, respectively). This is represented in **Table 4.12** below.

**Table 4.12: Association Between Socio-Demographic Characteristics and Academic Efficacy**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Total (n=375)** | **Low Academic Efficacy (n=38)** | **Moderate Academic Efficacy (n=115)** | **High Academic Efficacy (n=222)** | **p value** |
| **Age Group (Years)** |  |  |  |  | **0.001** |
| 17-20 | 87 (23.2) | 9 (23.7) | 25 (21.7) | 53 (23.9) |  |
| 21-23 | 162 (43.2) | 21 (55.3) | 59 (51.3) | 82 (36.9) |  |
| 24-27 | 100 (26.7) | 2 (5.3) | 22 (19.1) | 76 (34.2) |  |
| ≥ 28 | 26 (6.9) | 6 (15.8) | 9 (7.8) | 11 (5.0) |  |
| **Gender** |  |  |  |  | 0.667 |
| Male | 192 (51.2) | 22 (57.9) | 59 (51.3) | 111 (50.0) |  |
| Female | 183 (48.8) | 16 (42.1) | 56 (48.7) | 111 (50.0) |  |
| **University** |  |  |  |  | **< 0.001** |
| COHK | 100 (26.7) | 16 (42.1) | 31 (27.0) | 53 (23.9) |  |
| UCC | 71 (18.9) | 6 (15.8) | 23 (20.0) | 42 (18.9) |  |
| UDS | 60 (16.0) | 8 (21.1) | 27 (23.5) | 25 911.3) |  |
| UG | 79 (21.1) | 8 (21.1) | 20 (17.4) | 51 (23.0) |  |
| UHAS | 65 (17.3) | 0 (0) | 14 (12.2) | 51 (23.0) |  |
| **Academic Level** |  |  |  |  | **0.014** |
| 200 | 107 (28.5) | 19 (50.0) | 26 (22.6) | 62 (27.9) |  |
| 300 | 117 (31.2) | 8 (21.1) | 34 (29.6) | 75 (33.8) |  |
| 400 | 151 (40.3) | 11 (28.9) | 55 (47.8) | 85 (38.3) |  |
| **Religion** |  |  |  |  | 0.369 |
| Christian | 336 (89.6) | 36 (94.7) | 100 (87.0) | 200 (90.1) |  |
| Muslim | 39 (10.4) | 2 (5.3) | 15 (13.0) | 22 (9.9) |  |
| **Location** |  |  |  |  | **0.035** |
| On campus | 138 (36.8) | 21 (55.3) | 37 (32.2) | 80 (36.0) |  |
| Off campus | 237 (63.2) | 17 (44.7) | 78 (67.8) | 142 (64.0) |  |
| **Ethnicity** |  |  |  |  | **0.019** |
| Akan | 138 (36.8) | 21 (55.3) | 40 (34.8) | 77 (34.7) |  |
| Ewe | 65 (17.3) | 6 (15.8) | 23 (20.0) | 36 (16.2) |  |
| Ga | 87 (23.2) | 6 (15.8) | 18 (15.7) | 63 (28.4) |  |
| Others | 85 (22.7) | 5 (13.2) | 34 (29.6) | 46 (20.7) |  |
| **Study Financing** |  |  |  |  | 0.537 |
| Scholarship | 48 (12.8) | 7 (18.4) | 9 (7.8) | 32 (14.4) |  |
| Family | 298 (79.50 | 29 (76.3) | 95 (82.6) | 174 (78.4) |  |
| Loan | 15 (4.0) | 1 (2.6) | 5 (4.3) | 9 (4.1) |  |
| Self | 14 (3.7) | 1 (2.6) | 6 (5.2) | 7 (3.2) |  |
| **Medications Intake Due to Studies** |  |  |  |  | 0.265 |
| Never | 169 (45.1) | 23 (60.5) | 46 (40.0) | 100 (45.0) |  |
| Sometimes | 172 (45.9) | 12 (31.6) | 59 (51.3) | 101 (45.5) |  |
| Frequently | 34 (9.1) | 3 (7.9) | 10 (8.7) | 21 (9.5) |  |
| **Is Radiography Your Desired Profession** |  |  |  |  | 0.13 |
| No | 22 (5.9) | 5 (13.2) | 6 (5.2) | 11 (5.0) |  |
| Yes | 353 (94.1) | 33 (86.8) | 109 (94.8) | 211 (95.0) |  |

The data are displayed as frequencies (%). Chi-square p-values are reported, with p*˂* 0.05 considered statistically significant. P-values highlighted in bold are those that are statistically significant.

**4.8 Comparative Analysis of Emotional Exhaustion, Cynicism, and Academic Efficacy Across Five Universities**

The overall mean score for emotional exhaustion varied significantly among the universities, with COHK reporting a mean of 2.47 (SD = 0.72, Median = 3) and UDS showing a lower mean of 2.20 (SD = 0.61, Median = 2). UG had the highest mean emotional exhaustion score at 2.66 (SD = 0.60, Median = 3), while UHAS had a mean of 2.58 (SD = 0.50, Median = 3). The p-value of 0.000 indicates significant differences in emotional exhaustion levels across the universities.

In terms of cynicism, COHK had the highest mean score of 1.81 (SD = 0.87, Median = 2), while UCC had the lowest mean of 1.39 (SD = 0.71, Median = 1). The mean score at UDS was 1.52 (SD = 0.75, Median = 1), UG was 1.48 (SD = 0.78, Median = 1), and UHAS was 1.60 (SD = 0.81, Median = 1). The p-value of 0.046 suggests that there are significant differences in cynicism levels among the universities.

For academic efficacy, the highest mean score was observed at UHAS with a mean of 2.78 (SD = 0.41, Median = 3), and the lowest was at COHK with a mean of 2.37 (SD = 0.75, Median = 3). Other universities reported means as follows: UCC with 2.51 (SD = 0.65, Median = 3), UDS with 2.28 (SD = 0.69, Median = 2), and UG with 2.54 (SD = 0.68, Median = 3). The p-value of 0.001 indicates significant differences in academic efficacy across the universities.

These findings highlight the variability in emotional exhaustion, cynicism, and academic efficacy among students from different universities, with significant differences observed in both cynicism and academic efficacy. **Table 4.13** summarizes the mean, standard deviation (SD), and median scores for emotional exhaustion, cynicism, and academic efficacy across five universities.

**Table 4.13: Analysis of Emotional Exhaustion, Cynicism, and Academic Efficacy across the five universities**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | University of Study | | | | | | | | | | | | | | | | | |  |
|  | **COHK (n=100)** | | | | | **UCC (n=71)** | | | **UDS (n=60)** | | | **UG (n=79)** | | | **UHAS (n=65)** | | | |  |
| **Variables** | **Mean** | | **SD** | | **Median** | **Mean** | **SD** | **Median** | **Mean** | **SD** | **Median** | **Mean** | **SD** | **Median** | **Mean** | **SD** | **Median** | **p value** | | |
| Emotional Exhaustion (5 items, 0-30) | 2.47 | 0.72 | | 3 | | 2.55 | 0.63 | 3 | 2.2 | 0.61 | 2 | 2.66 | 0.6 | 3 | 2.58 | 0.5 | 3 | 0 | | |
| Cynicism (4 items, 0-24) | 1.81 | 0.87 | | 2 | | 1.39 | 0.71 | 1 | 1.52 | 0.75 | 1 | 1.48 | 0.78 | 1 | 1.6 | 0.81 | 1 | 0.046 | | |
| Academic Efficacy (6 items, 0-36) | 2.37 | 0.75 | | 3 | | 2.51 | 0.65 | 3 | 2.28 | 0.69 | 2 | 2.54 | 0.68 | 3 | 2.78 | 0.41 | 3 | 0.001 | | |