

Yousef M. Aljawarneh
Rabiha Seboussi
Gregory L. Blatch *Editors*

Advancements in Health Sciences

Insights into Technology, Education, and
Biomedical Research

 Springer

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and Biomedical Research

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Editors

Yousef M. Aljawarneh
Higher Colleges of Technology, UAE
Fujairah, United Arab Emirates

Rabiha Seboussi
Higher Colleges of Technology, UAE
Abu Dhabi, United Arab Emirates

Gregory L. Blatch
The University of Notre Dame Australia
Fremantle, WA, Australia

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Preface

It is with great pleasure that we introduce this volume, which serves as the culmination of the Higher Colleges of Technology (HCT) International Conference on Advancements in Health Sciences (ICAHS), 2023. This conference, established by the HCT Faculty of Health Sciences, convened a diverse array of academics, students, practitioners, researchers, healthcare stakeholders, and industry representatives. Held from March 8-9, 2023, at the HCT-Dubai Men's Campus in Academic City, the inaugural ICAHS-2023 was dedicated to exploring "Innovations in Health Science Education, Healthcare, and Outcomes". The conference was attended by more than 500 participants, with 9 international keynote talks, 15 industry keynote talks, 11 scientific talks, 11 workshops and 29 poster presentations. Through these different interactive formats, the participants explored a range of contemporary topics, which included interdisciplinary innovations in health science education, emerging technologies in healthcare practice (telehealth and AI), novel diagnostics and therapies for communicable and non-communicable diseases, community and public health in action (integrating social, mental, diagnostic, emergency and pharmaceutical services), and the impact of global pandemics on veterinary and healthcare professionals and services.

This book arises from the conference proceedings and is an integrated reflection of the multidisciplinary and interdisciplinary themes, with contributions from authors representative of the full spectrum of participants from national and international university-based academics to local and regional industry-based practitioners. The book chapters offer valuable insights and perspectives that contribute to our understanding of the major challenges and opportunities in health sciences, including mental health issues of high-risk cohorts, digital health and health information management, evaluation of laboratory analytics in hospital settings, molecular basis of viral disease, prediction of virus infection risk, knowledge and awareness of telemedicine and applications of AI in public health.

Furthermore, this book serves as a testament to the collaborative spirit and dedication of HCT and the Faculty of Health Sciences. By providing access to high-quality professional development materials and fostering international collaboration and recognition, the ICAHS has enhanced the research and innovation capacity of HCT staff and students, further solidifying HCT's reputation as a leading applied education and research entity in the field of health sciences.

In conclusion, we hope that this volume will serve as a valuable resource for researchers, practitioners, educators, policymakers, and industry professionals alike, driving continued innovation and excellence in health science education and healthcare outcomes.

Fujairah, United Arab Emirates
Fremantle, WA, Australia
Abu Dhabi, United Arab Emirates

Yousef M. Aljawarneh
Gregory L. Blatch
Rabiha Seboussi

Acknowledgements

We would like to acknowledge everyone who played a role in the conception and execution of the ICAHS conference and this fascinating and creative book project. In particular, we extend our heartfelt appreciation to HCT Senior Management, including The President & CEO Dr. Faisal Alayyan and the Advisor to President & CEO, Dr. Addel Al Ameri, for their unwavering support of this initiative.

We would like to express our sincere gratitude to all the authors whose valuable contributions have enriched this volume. We also extend our gratitude to the diligent reviewers who provided robust peer-review reports, ensuring the quality and integrity of the content. In our capacity as editors, we have felt very privileged to have had the opportunity to oversee this book project, which has gifted us with the uniquely positive experience of networking with these highly professional health sciences experts across the globe.

We received tremendous support from Nature Springer in the planning and rolling out of this book project. Special mention needs to be made of Dr. Annette Klaus, who always provided prompt, expert advice and guidance.

Finally, we would be remiss in not highlighting the tireless efforts of the ICAHS Conference Organizing Committee and the Conference Steering Committee in executing the ICAHS conference, which laid the foundation for this excellent book project.

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About the Editors

Yousef M. Aljawarneh Dr. Yousef M. Aljawarneh obtained his PhD in Nursing from the University of Texas at Houston (UTHealth, USA), and has worked as an academic and a clinician for over 20 years. He is a Fellow of the Higher Education Academy (FHEA, UK), and has extensive teaching experience, having taught undergraduate and graduate students at several national and international academic institutions. He is currently the Academic Program Chair of Nursing in the Faculty of Health Sciences, Higher Colleges of Technology, UAE (since 2019). Previously, he has held Faculty positions at a number of national (e.g. Fatima College for Health Sciences, UAE) and international higher education institutions (e.g. University of Texas at Houston, USA). Dr. Aljawarneh's research and scholarly activities focus on several areas within Nursing and Healthcare Practice. He has published his work in top international journals, and been awarded research grants from peak international funding bodies (e.g. World Health Organization). Dr. Aljawarneh serves as the Chair of the Conference Scientific Committee for the HCT International Conference on Advancements in Health Sciences (ICAHS) 2023, the Sub-chair of the HCT International Conference on Competency-Based Education, and a member of the Organizing Committee for the HCT International Conference on Advancements in Health Sciences (ICAHS) 2023.

Rabiha Seboussi Dr. Rabiha Seboussi obtained her PhD from Montpellier SupAgro, France, and pursued post-doctoral studies at the Department of Animal Science at Laval University in Quebec, Canada. With over 27 years of experience in the field, Dr. Seboussi has held various academic and leadership positions. She currently serves as the Associate Executive Dean of the Faculty of Health Sciences, Higher Colleges of Technology, UAE. Dr. Seboussi's research interests center around animal nutrition and the impact of the interrelated concepts of food safety and food security on human health and wellbeing. Aside from her academic and research work, Dr. Seboussi has also been actively involved in consultancy projects and played a key role in the development and implementation of veterinary science and health sciences training programs at national and international levels. Dr. Seboussi served as the Chair of the Conference Organizing Committee for the HCT International Conference on Advancements in Health Sciences (ICAHS) 2023.

Gregory L. Blatch Professor Gregory Blatch has worked in academia for over 30 years, and his contributions to the academy and the promotion of science more broadly, have been recognized through a number of awards and fellowships (e.g. Senior Fellow of the Cell Stress Society International, FCSSI; Fellow of the Royal Society of South Africa, FRSSAf). He most recently served as Executive Dean of the Faculty of Health Sciences, Higher Colleges of Technology, UAE (2021-2023). Previously, he served as Pro Vice-Chancellor (PVC) Research at the University of Notre Dame Australia (2017-2020) and remains associated as Emeritus Professor. He has developed teaching and research capacity at Departmental, School, Faculty and University-wide levels, with over 10 years of experience as a Senior/Executive Leader. His personal research interests fall within the broad field of cellular stress biology, and he is an international leader for his work on the role of stress proteins in disease (e.g. cancer) and infection (e.g. malaria). Professor Blatch served as the Chair of the Conference Steering Committee for the HCT International Conference on Advancements in Health Sciences (ICAHS) 2023.



Predictors and Associated Factors for Depression, Stress and Anxiety Among Undergraduate Colleges Students

Heyam Dalky, Yousef M. AlJawarneh, and Lubna Rajab

Abstract

The COVID-19 pandemic affected students instigating psychological issues mainly depression, stress, and anxiety. The current study aimed to identify the predictors and associated factors for depression, stress and anxiety among undergraduate colleges students during the COVID-19 pandemic. A total of 206 students from the Higher College of Technology, Sharjah Campuses participated in this descriptive cross-sectional study. Data was collected between March and May 2021 via online survey including a demographic data questionnaire and the depression, anxiety, stress scale (DASS-21). The mean depression, stress, and anxiety scores were 15.56 (± 11.573), 17.13 (± 10.946), and 14.90 (± 10.523) respectively. There was no statistically significant correlation between age and depression score ($r = 0.020$, $n = 207$, $p = 0.770$), stress score ($r = 0.020$, $n = 207$, $p = 0.779$), and anxiety score ($r = -0.011$, $n = 207$, $p = 0.876$). No statistically significant correlation was found between the students' depression, stress and anxiety scores and the study variables. Gender statistically and significantly predicted the students' depression category ($\beta = -1.445$, $p = 0.018$), and females were 1.445 (95% CI, -2.642 to -0.249) times less likely to have higher depression than males. The odds of single students having higher depression

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H. Dalky (✉)

Faculty of Nursing, Community Mental Health Department Jordan University of Science and Technology, Irbid, Jordan
e-mail: hfdalky@just.edu.jo

Y. M. AlJawarneh · L. Rajab

Faculty of Health Sciences, Higher Colleges of Technology, Fujairah, UAE
e-mail: yaljawareh@hct.ac.ae; lrajab@hct.ac.ae

score was 2.918 (95% CI, -0.244 to 5.593) times that of their counterparts Wald $\chi^2(1) = 4.575, p = 0.032$. The odds of single students having higher stress score was 21.921 (95% CI, 18.998 to 24.645) times that of their counterparts Wald $\chi^2(1) = 229.510, p < 0.001$. This underlines the need for identification and management of vulnerable students.

Keywords

Anxiety · COVID-19 · Depression · Stress · United Arab Emirates · University students

1 Introduction

The Coronavirus Disease 2019 (COVID-19) is a highly contagious infectious virus that was first identified in late December 2019 from Wuhan, China and then spread globally over more than 200 countries. The World Health Organization (WHO) announced the situation as a global pandemic on March 11, 2020. As of May 2022, over 500 million confirmed cases and over six million COVID-19 associated deaths have been documented worldwide (World Health Organization 2022).

In the wake of the COVID-19 outbreak, a world-wide lockdown was initiated in consort with massive closures of major places such as schools, universities, malls, and restaurants causing individuals to adjust their social occupational and familial lifestyle (Saladino et al. 2020). This created a sense of uncertainty and unpredictability thereby taking a toll on people's psychological status. Prominently, the negative influence of the COVID-19 pandemic on mental health has become a matter of concern for clinicians and researchers. Research studies were dedicated to explore the impacts of psychological distress during the spread of COVID-19 infection and lockdown at the individual, community, and global levels (Copeland et al. 2021). In the Arab World, the psychological impact of the pandemic was manifested by depression, anxiety, and stress with estimated prevalence of 57%, 40.5%, and 38.1%, respectively among youth (Al Omari et al. 2020).

Among the general population, it was experiential that students and teachers suffered more psychological distress, such as anxiety, depression, and stress and students exhibited needs for immediate psychological help (Copeland et al. 2021). Particularly, university students have faced intensified stress due to campus evacuations and the transition to remote learning (Serafini et al. 2020). The educational process and learning style for students was totally changed requiring extensive exhaustion of resources increasing their vulnerability (Son et al. 2020). The experience of semester disruption was coupled with negative emotions including but not limited to, isolation and frustration. Moreover, undergraduate university students were distressed over their academic progress in light of changes on teaching and assessment modes. These intense feelings are further fueled by the threat of the virus

affecting livelihood and wellbeing of loved ones resulting in various psychological issues such as depression, anxiety, and stress (Copeland et al. 2021).

Across the body of literature, researches were dedicated to explore those emerging mental health problems and their correlates. For the general Emirati population, correlates of depression and anxiety were younger age, female gender, previous mental health problems, persistent COVID-related anxiety and financial difficulties (Thomas et al. 2020). As for Emirati university students, depression and anxiety were commonly related to affluence and maternal education (Awadalla et al. 2020). In Canada, a cross-sectional survey on university students found the prevalence of stress, depression, and anxiety to be 80.3%, 39.5%, and 23.8% respectively. Depression was associated with grade-point-average, family factors, social factors, self-rated health and political factors. Anxiety was associated with family factors, socioeconomic factors, and age; and stress was associated with grade-point-average and social factors (Othman et al. 2019). Furthermore, in China, the recorded prevalence of stress depression and anxiety among university students was 34.9%, 21.1%, and 11.0% respectively. The common associated factors identified were having infected acquaintances, high media exposure, low perceived social support, and seniority level of study (Ma et al. 2020). The current study aimed at identifying the predictors and associated factors for depression, stress and anxiety among undergraduate colleges students in the UAE during the COVID-19 pandemic.

2 Materials and Methods

2.1 Participants

This study employed a cross-sectional design to assess psychological status among undergraduate university students at Higher College of Technology (HCT), Sharjah campuses and identify corresponding predictors and associated factors. A total of 3106 students from all programs received online survey containing the study measuring questionnaires. The included participants were to be above 18 years old, and currently studying at Sharjah campuses. Consent was obtained from each participant prior to enrollment in the study. The study was approved by the HCT Research and Ethical Integrity Committee (REIC) (Dalky et al. 2022).

2.2 Study Design and Procedures

Due to the transition to online learning and teaching imposed during COVID-19 pandemic, the demographic data questionnaire and the DASS-21 were converted into an online survey using Google Docs and sent to the potential participants using their university email address. The survey link includes a digital consent form and the participants' information sheet. Participation was completely voluntary and participants had the right to withdraw from the study at any time without reasons. Participation was anonymous and all responses were kept confidential in a secured

and password protected device. There was no anticipated physical or psychological harm from participating in this study with no academic ramification from not participating in the study. Data were collected between March and May 2021. A 1-month email reminder was sent to all potential participants after the initial dissemination of the study survey. All completed surveys were received by the Principal Investigator (PI) and screened for incomplete or missing data.

2.3 Measures

The purpose of the study was to identify the predictors and associated factors for depression, stress and anxiety among undergraduate colleges students in the UAE during the COVID-19 pandemic. A demographic data questionnaire with 12 questions was developed by the authors of this study collect participants' demographic variables, history of depression, anxiety, and stress symptoms, and history of psychiatric therapy. The Depression, Anxiety and Stress Scale-21 Items (DASS-21) was used to measure the psychological status of the students in form of depression, anxiety and stress. The DASS is a self-report scale designed to measure the negative emotional status. The original scale constitutes of 42 items, however, for the purpose of this study, the short form (21-items) was utilized (Lovibond and Lovibond 1996). The DASS-21 is a short form scale contains 21 items with three subscales as follows: depression subscale (7 items), anxiety subscale (7 items) and stress subscale (7 items). Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest /involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items and then multiplying by two (Lovibond and Lovibond 1996). Respondents rate the presence of each symptom during the past week on a scale from 0 to 3. Correspondingly, 0 denotes did not apply to me at all; 1 denotes applied to me to some degree, or some of the time; 2 denoted applied to me to a considerable degree or a good part of time; and 3 denotes applied to me very much or most of the time. Scores for each subscale classified into 5 levels: normal, mild, moderate, severe and extremely Sever. For depression subscale, normal, 0–9; mild, 10–13; moderate; 14–20; severe, 21–27; and extremely severe, 28 and above. For anxiety subscale, normal, 0–7; mild, 8–9; moderate, 10–14; severe, 15–19; and extremely severe, 20 and above. For Stress subscale, normal 0–14; mild, 15–18; moderate, 19–25; severe, 26–33; and extremely severe, 34 and above (Lovibond and Lovibond 1996).

Evidently, DASS-21 has proven psychometric properties with a satisfactory discriminant reliability of Cronbach's alpha values. Cronbach's alpha was 0.942