

AMERICAN UNIVERSITY OF BEIRUT

THE RELATIONSHIP BETWEEN DEPRESSION,
DISPOSITIONAL MINDFULNESS, AND RESILIENCE IN A
SAMPLE OF NURSING AND MEDICAL STUDENTS IN
LEBANON

by
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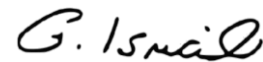
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ABSTRACT

OF THE THESIS OF

Fatima Mohammad Al-Dirani for Master of Nursing
Major: Psychiatric and Mental Health Clinical
Nurse Specialist Program

Title: The Relationship Between Depression, Dispositional Mindfulness and Resilience in a Sample of Nursing and Medical Students in Lebanon

Background: Nursing and medical students experience high stress levels which increase their risk for depression. Literature has shown that dispositional mindfulness and resilience are protective factors against depression, and resilience is hypothesized to mediate this relationship. However, further studies are needed to ascertain the relationship between depression, mindfulness and resilience, to better understand depression in this population and formulate interventions that may help improve these students' mental health in Lebanon.

Aims: The primary purpose of the study was to investigate depression in a Lebanese sample of nursing and medical students and the relationships between depression, mindfulness and resilience.

Method: The study employed a cross-sectional quantitative survey design. A convenience sample of undergraduate nursing students and medical students at the American University of Beirut (AUB) were invited via email to participate in the study. Key demographics were assessed through a questionnaire. Participants completed the Patient Health Questionnaire (PHQ-9), Connor Davidson Resilience Scale (CD-RISC10) and Cognitive and Affective Mindfulness Scale Revised (CAMS-R) to assess for depression, resilience, and dispositional mindfulness levels respectively.

Analysis: Descriptive statistics were conducted on the levels of depression, dispositional mindfulness and resilience. Pearson's correlation coefficients and multiple linear regression were carried out to determine the relationships between depression and study variables. Finally, mediation analysis was done following Baron and Kenny's method.

Results: 82 nursing students and 48 medical students participated in this study. The prevalence of depression was 21.2% (PHQ-9 \geq 12). Mean scores of depression, resilience and dispositional mindfulness were 7.64 (SD= 5.72), 26.1 (SD= 7.41), and 26.2 (SD= 5.67) respectively. Dispositional mindfulness was the strongest predictor of depression in nursing and medical students (B= - 0.312, p< 0.01). Resilience and demographic variables did not significantly predict depression. Resilience was not found to mediate the relationship between dispositional mindfulness and depression (z= 0.996, SD= 0.081, p> 0.05).

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CHAPTER I

INTRODUCTION

Nursing and medical programs are amongst the most stressful university programs. They often incorporate theoretical and clinical components within each semester. Students are expected to learn the theoretical component, while fully attending to their clinical training. Given these stressors, studies have shown that medical students exhibit higher levels of psychological distress than the general population (Dyrbye et al., 2006). Similarly, nursing students scored significantly higher on depression, anxiety, and stress measures compared to other students and the adult population (Chernomas & Shapiro, 2013). Overall, the cumulative stress experienced by nursing and medical students during their education and training can contribute to having increased psychological distress, particularly depression (Pacheco et al., 2017; Xu et al., 2013). Depression seriously impacts students' lives through affecting their academic performance (Mihailescu et al., 2020; Ruz et al., 2018), increasing compassion fatigue levels (Hegney et al., 2014) and subsequently diminishing the quality of care provided for patients (Gong et al., 2014; Welsh, 2009).

Given these debilitating effects of depression on nursing and medical students, studies have investigated mindfulness and resilience as protective factors that decrease the impact of various psychological stressors (Alzahrani et al., 2020; He et al., 2018; Keng et al., 2011; Ríos-Risquez et al., 2016; Lebares et al., 2018). Investigating mental health interventions, aimed at enhancing mindfulness and resilience, has been a main focus in research. Mindfulness is the process of directing one's awareness and attention to internal and external experiences non-judgmentally (Rees et al., 2016). Dispositional mindfulness

(DM) is described as the trait-like tendency to uphold such mindful and behavioral qualities (Rees et al., 2016). Several studies have associated DM with decreased risk of depressive symptoms, suicidal ideations, high anxiety, and burnout (He et al., 2018; Garland et al., 2011; Lebares et al., 2018; Roemer et al., 2009; & Salvarani et al., 2020). In medical students, mindfulness was found to be protective against depression and stress (Alzahrani et al., 2020). Similar findings were also noted among nursing students, where mindfulness was correlated with lower depressive symptoms and better psychological well-being (He et al., 2018). Therefore, mindfulness has been shown to play a positive role in students' psychological adaptability, including lower risk for depression. A few recent studies have also investigated the relationship between mindfulness traits and resilience levels, and found that higher DM levels are associated with higher resilience levels in university students, including nursing students (Dhar et al., 2019; Rees et al., 2015; Hegney et al., 2014).

Resilience is a complex construct defined as an individual's ability to recover, rebound or even thrive following adversity (Garcia-Dia et al., 2013). In medical students, resilience has been found to affect their quality of life through a dose-response relationship (Tempiski et al., 2015) and was negatively correlated with psychological distress (Bacchi & Licinio, 2017) and depression (Cheng et al., 2019; Dyrbye et al., 2010). Similar results were noted among nursing students where resilience was found to be positively correlated with academic success and psychological well-being (Beauvais et al., 2014; Ríos-Risquez et al., 2016). Furthermore, some studies have shown that the role of resilience extends beyond being negatively correlated with negative psychological outcomes. Specifically, these studies found that resilience mediated the relationships between psychological

constructs such as dispositional mindfulness and psychological outcomes, such as burnout (Heritage et al., 2019; Rees et al., 2016). These studies further hypothesized that this mediational role of resilience applies to the relationship between mindfulness and depression. However, these findings were inconsistent with the results reported by Neelarambam (2015) who found that resilience did not mediate the relationship between mindfulness and depression in a sample of University students in the United States. Therefore, more studies might be needed to investigate the relationships between depression, mindfulness, and resilience, specifically in nursing and medical students' population.

Few studies were conducted on depression, mindfulness, or resilience in the Arab region. Depression levels in students significantly varied between one country and another, but the prevalence of depression was overall higher than that of students in the US (Kronfol et al., 2018). Findings that investigated the relationship between depression and mindfulness were consistent with international studies (Rees et al., 2015). Higher mindfulness scores were negatively associated with depression symptoms in studies that included patients suffering from depression in the United Arab Emirates (Thomas et al., 2021), a sample of university students in Lebanon (Saffiedine, 2020) and a sample of medical students in Saudi Arabia (Alzahrani et al., 2020).

For resilience, most studies investigated this concept in the context of war rather than a protective factor for depression in university students (Arnetz et al., 2013, Thabet & Thabet, 2015, Alghamdi, 2020; Wright et al., 2016). Findings from these studies also aligned with those from international studies where resilience was protective against negative psychological outcomes in individuals post war (Arnetz et al., 2013, Thabet &

Thabet, 2015, Alghamdi, 2020; Wright et al., 2016). Few studies assessed for the role of resilience in university students and found it to predict positive psychological adaptation (Alsadi & Drabie, 2020; Thabet et al., 2015). Studies investigating resilience and its correlation with depression or the its proposed mediator role in nursing or medical students in this region are lacking, and only one study assessed for the role of mindfulness against depression in medical students (Alzahrani et al., 2020).

Thus, it is difficult to reach definitive conclusions about the roles of resilience and mindfulness with regards to depression in the Arabic Context due to the scarcity of studies. Investigating potential protective roles of these psychological constructs against depression is especially important in Lebanon which has been experiencing increasing challenges due to the unstable political situation, economic crisis, global pandemic and major explosion in the capital Beirut in 2020. These challenges in Lebanon have affected the mental health of the population in general where two in three patients presenting to a group of clinics in the Capital had depression or anxiety symptoms (Doctors without Borders, 2020). These mental health effects would also extend to nursing and medical students who are thriving to complete their education with both its clinical and theoretical components despite these challenges. Therefore, it would be very important to determine depression levels in nursing and medical students in a university setting in Lebanon and to investigate the possible protective factors, mindfulness and resilience.

A. Study Significance

Given the importance of the psychological wellbeing of nursing and medical students as the future healthcare professionals, the current study aimed to investigate

depression in nursing and medical students and the relationship between depression, mindfulness and resilience to better understand depression in this population and formulate curricular interventions that may help improve nursing and medical students' mental health in Lebanon.

CHAPTER II

LITERATURE REVIEW

The first part of this section reviews the main study variables: depression, dispositional mindfulness, and resilience. For depression, the prevalence and impact that depression has on nursing and medical students is considered. The following section discusses the sociodemographic variables associated with depression, as it is the main variable under study. In light of depression's debilitating effects on nursing and medical students and given findings of previous studies that proposed that mindfulness and resilience were protective against depression, the correlations between depression, mindfulness and resilience are then examined. In each subsection, a brief review of the studies done in the Arab region relating to the variable of concern is included. Following that, a review of studies that examine the relationships between the three variables together, depression, dispositional mindfulness and resilience, is incorporated.

A. Depression

Depression is one of the most common mental disorders and has been declared as the leading cause of disability in the world (WHO, 2015). Depression entails a persistent low mood or anhedonia which is the loss of pleasure in usually pleasurable activities. Other symptoms of depression include low energy, increased/decreased appetite, insomnia/hypersomnia, slow or irritable psychomotor activity, feelings of worthlessness or guilt, and suicidality (American Psychiatry Association, 2013). These symptoms affect the functionality of the individuals in their relationships, education, occupation, or other life

aspects. Depression can be an episode, recurrent episodes or chronic. Two main subcategories of depression include Major Depressive Disorder and Dysthymia. This study will assess for a current depressive episode without assessing for chronicity, thus dysthymia.

Moreover, depression highly affects nursing and medical students, where depression rates in this population are higher than that of the general public (Lim et al., 2018; Tung et al., 2018). A recent systematic review showed a high pooled prevalence of depression of 34% among nursing students globally (Tung et al., 2018). Also, the prevalence of depression in medical students globally was found to be between 27.2% (Rotenstein et al., 2016) and 28.0% (Puthran et al., 2016), with 11.1% reporting suicidal ideations (Rotenstein et al., 2016). These rates are higher than the rate of depression in the general population, where the pooled prevalence of depression was found to be 12.9% in a recent meta-analysis of 30 countries (Lim et al., 2018). Furthermore, longitudinal studies comparing depressive symptoms in students before medical school and during it showed an increase in symptoms by around 13.5% in these students (Rotenstein et al., 2016). This re-ascertains that medical students might be at a higher risk for depression.

In the Arab Region, the prevalence of depression in students differs from one country to another. The reporting of depressive symptoms ranged between 26% in nursing students in Jordan (Yousef et al., 2017), 34.6% in university students from Qatar & Lebanon combined (Kronfol et al., 2018), 41.3% in medical students in Egypt (Al-Maashani et al., 2020), 43% in medical students in Palestine (Shawahna et al., 2020), 45% in health students in Saudi Arabia (Hamasha et al., 2019), to an alarming 60.6% in Syrian medical students and 60.8% in medical students in another Egyptian University (Abdel-Wahed & Hassan, 2016). The

prevalence of depression in different Arab countries was higher than the prevalence in the US which was 12.8% (Kronfol et al., 2018). However, the samples in these studies were convenience samples from a certain university in a given country and the results would not be generalizable to all the student population in their respective country. Similarly, studies done in countries outside the region also often employed convenience sampling, to ease accessibility to the population of interest (Grund, 2013; Moreira & Furegato, 2013; Sobowale et al., 2014). However, several studies done in the West assessed for depression in nursing and medical students at a national level to assure the generalizability of the prevalence of depression to the whole population of concern (Christensson et al., 2011; Pan et al., 2016; Sun et al., 2011). The inconsistencies in the prevalence of depression between one country and another in the Arab region can be partially explained by different socio-economic and political statuses in the countries, where lower socioeconomic status and conflicts are associated with higher depression rates (Abdel-Wahid & Hassan, 2016; Al-Saadi et al., 2018; Kronfol et al., 2018). Moreover, the stigma surrounding mental illnesses affects response bias and thus the reported rates of depression, and even affects the trajectory of the illness as it delays diagnosis, treatment, and individuals' tendency to seek mental health services (Dardas et al., 2016; Dardas & Simmon, 2015). Given these different factors, the rates of depression in one Arab country cannot be generalized to another. Therefore, to determine the levels of depression in nursing and medical students in a Lebanese population, the investigation should target this sample specifically, especially given the recent stressors that might affect depression in this population.

Few studies addressed the mental health of medical and nursing students in Lebanon. The prevalence of depression in medical students in Lebanon ranged between 23.8% in a

sample from the American University of Beirut (Talih et al., 2017) and 34% in a sample from the Lebanese Public University (Naja et al., 2016), with a high prevalence of burnout (43%) and suicidal ideations (14.5%) (Talih et al., 2017). Similarly, depression was highly prevalent in nurses (36.2%) and was associated with burnout (Talih et al., 2018). Gender was the only demographic variable significantly associated with depression in medical students, but this correlation was not reported in nurses (Talih et al., 2017, Talih et al., 2018) Another study highlighted the possible repercussions of poor mental health on healthcare professionals with two out of five Lebanese nurses working at Public Health Centers indicating that they are likely to quit their job in the upcoming couple of years (Alameddine et al., 2012). Thus, these studies prompted on the importance of designing interventions that support the psychological well-being of healthcare professionals.

In light of this, not only does the burden of depressive symptoms lie in its high prevalence, but also in its impact on individual's productivity, functionality, and daily life (WHO, 2015). According to Institution of Health Metrics (IHME, 2019), the burden of depression in adolescents and young adults, which is the age group that most nursing and medical students belong to, is higher than the burden of depression in other age groups. The effect that depression has on nursing and medical students extends to different aspects of their lives. Academic performance has been shown to be lower in students that are suffering from depressive symptoms (Mihailescu et al., 2020; Ruz et al., 2018). Additionally, higher levels of depression were significantly associated with higher levels of compassion fatigue and burnout, which consequently affected the quality of care provided to patients (Hegney et al., 2014). Moreover, it was shown that depression constitutes a major cause of suicide in

university students (Peltzer et al., 2017) and is a major risk factor for substance abuse behavior (Bravo et al., 2017).

Findings from these studies highlighted the debilitating effects of depression on nursing and medical students and thus, the need to address this highly prevalent problem. Recently, Rees et al. raised a concern that the interventions that address the mental health of students often adopted an overinclusive approach where several techniques were included in hope that one of them was effective (2015). They concluded that determining the relationships between the psychological constructs and the psychological outcome targeted in a certain intervention is very important to build upon these interventions (Rees et al., 2015). Two of the psychological constructs that were found to positively impact psychological adaptability, including being protective against depression, were mindfulness and resilience. Mindfulness has been utilized in third wave therapies to treat psychopathologies, and has been shown to be an effective treatment option (Safieddine, 2020). Similarly, resilience has been receiving increased focus in the literature over the past decade where its relationship with depression, stress, burnout, compassion fatigue and other psychological outcomes has been investigated, and raised attention about its role (Garcia-Dia et al., 2013). However, while mindfulness and resilience are conceptually different, the overlap between these two constructs in relation to psychological adjustment, particularly depression, was yet to be ascertained (Rees et al., 2015). To further elaborate, each of the constructs, mindfulness and resilience, and their relationship with depression, will be discussed in details after the section on sociodemographic variables.

B. Sociodemographic Variables Associated with Depression

Sociodemographic variables associated with depression in the studies reviewed included gender, age and year of study. For gender, it was well established that women are at a higher risk of depression in different populations, including medical students (Ahmadi et al., 2014; Dahlin et al., 2005; Goebert et al., 2009) and nursing students (Ardilla-Herrero et al., 2013; Christensson et al., 2009). Specifically, female medical students were found to have higher odds for depression by 1.3 times compared to their male counterparts (Pacheco et al., 2019). The differences in depression rates between males and females in the Arab region are similar to those in international studies (Abdel-Wahed & Hassan, 2016; Al-Maashani et al., 2020; Al-Saadi et al., 2017; Hamasha et al., 2019; Kronfol et al., 2018). However, another point to consider is that nursing is generally still a female-dominated field, and so several studies did not report on the differences between males and females in this population (Tung et al., 2018).

As for age, higher age was associated with lower depressive symptoms in these students (Puthran et al., 2016; Steptoe et al., 2007). In terms of the year of study, being a clinical level student was correlated with higher depressive symptoms in medical students (Iqbal et al., 2015; Ngasa et al., 2017, Paro et al., 2015) and nursing students (Jimenez et al., 2010). A similar pattern was found among medical students in the Arab region, where a higher year of study was also correlated with depression (Abdel Wahed & Hassan, 2016; Shawahna et al., 2020). Thus, the prolonged exposure to stressors, such as those associated with clinical years of medical and nursing school might explain the increased depressive symptoms of higher year students.

Living arrangements were also considered as contributing factors, since previous studies found them to be correlated with depression in students (Deb et al., 2016; Roh et al., 2010). These studies reported that both living alone and negative perceptions of one's living arrangements constituted a risk factor for depression. On the other hand, a study done on AUB medical students in Lebanon found the correlation between depression and living arrangements to be insignificant (Talih et al., 2017). Given what was mentioned, the demographic variables we assessed and controlled for in this study were gender, age, major, year of study and living arrangements.

C. Dispositional Mindfulness (DM)

Mindfulness is defined as “the awareness that emerges through paying attention on purpose, in the present moment and non-judgmentally to the unfolding of experience moment to moment” (Kabat-Zinn, 2003, p. 145). Bishop et al. (2004) gathered a consensus panel to generate an operational definition of mindfulness, which was then based on attention and awareness to one's experience. Attention involves an individual's regulation of their observation to be focused on their current experience, while awareness is adopting an orientation characterized by openness and acceptance towards those experiences. Thus, four components are common to these definitions of mindfulness which are: 1) attention regulation, 2) orientation to present moment, 3) awareness of one's experience, and 4) acceptance attitude towards one's experiences (Feldman et al., 2006). It is then apparent that the processing of one's experiences would involve objective awareness and less judgement when led by mindfulness (Brown et al., 2007), and their reactions to the environment and inner experiences would be more flexible (Safieddine, 2020).

Mindfulness is conceptualized and has been studied as a trait (stable characteristic) which is dispositional mindfulness, and as a state (momentary condition) (Tomlinson et al., 2018). Dispositional mindfulness (DM) can be improved through mindfulness-based interventions such as mindfulness-based stress reduction and mindfulness-based cognitive therapy (Kabat-Zinn 1990; Segal et al. 2002). DM occurs at different levels in a population. Programs and interventions based on improving DM were shown to decrease burnout and to increase compassion satisfaction and resilience in healthcare professionals (Bonamer & Aquino-Russel, 2019; Clarkson et al., 2018; Delaney, 2018; Duarte & Pinto-Gouveia, 2016; Slatyer et al., 2018). A systematic review revealed that DM facilitates adaptive psychological functioning and is positively associated with psychological health. These effects included decreased psychological symptoms, decreased emotional reactivity, increased subjective well-being and improved behavior regulation (Keng et al., 2011). Moreover, a recent population-based study found that mindfulness, particularly acting with awareness and non-reactivity to inner experiences, was positively correlated with a positive state of mind and perceived well-being and had a significant negative relationship with depression (Branstrom et al., 2011).

The mechanism for the protective role of mindfulness against depression rests on the notion that being aware and accepting rather than struggling with the negative cognitions present in depression, including one's perceptions of self, surroundings, and the world, helps decrease the intensity of the impact of these cognitions (Beck et al., 1979; Hofman & Gomez, 2017). Similarly, mindfulness might decrease rumination associated with depression, where one's ability to direct attention and stay in the present helps prevent the person from being stuck in this rumination (Baer, 2003). Another possible mechanism

hypothesizes that mindfulness improves an individual's ability to manage negative emotions through increasing awareness and decreasing the reactivity to internal experiences (Coffey et al., 2010; Shapiro et al., 2006). These mechanisms help provide insight into findings of different studies where mindfulness was shown to be protective against depression. In a recent model proposed by Rees et al. (2015), mindfulness was also hypothesized to have an indirect effect on depression via resilience. However, the mechanism by which mindfulness was proposed to be correlated with decreased depression symptoms was not different from what was presented, whereby the authors have explained that high mindfulness levels improves a person's ability to decenter their perspective to events and respond flexibly to thoughts and emotions (Rees et al., 2015). Additionally, the authors clarified that this decentering of experiences enables an individual to have more balanced cognitive appraisal of events (Rees et al., 2015). Lastly, the authors further hypothesized that through cultivating higher mindful abilities, an individual's resilience levels, or ability to adapt, are improved and this in return decreases depressive symptoms.

Moreover, several studies specific to the student population have similarly found mindfulness to be correlated with depression (Baer et al., 2006; Brown & Rayan, 2003; Medvedev et al., 2018; Schut & Boelen, 2017; Slonim et al., 2015; Soysa & Wilcomb, 2015). Soysa & Wilcomb examined the relationship between mindfulness and depression in a female-dominated sample of university students. Mindfulness was found to significantly predict depression scores even after accounting for gender, self-compassion and self-efficacy (2015). Higher mindfulness scores were also correlated with lower depression scores in a sample of both university students and general population (Medvedev et al., 2018). Similar results were found in two other older studies among psychology

undergraduate students (Baer et al., 2006; Brown & Rayan, 2003). In another longitudinal study that assessed for depression, mindfulness, experiential avoidance, and rumination in a university student sample, only mindfulness remained significant in predicting lower depression symptoms at one-year follow-up (Schut & Boelen, 2017). These findings reflect that mindfulness is a more robust protective factor than low avoidance or rumination for depression. Studies that assessed the correlation between dispositional mindfulness and depression in medical students and nursing students were scarce (Al-zahrani et al., 2020; Sajjadi & Askarizadeh, 2015; Slonim et al., 2015). However, findings from these studies were still consistent with previous studies, where mindfulness was significantly correlated with depression in this population. Two factors that affected generalizability were that samples in all the studies were convenience samples and most of these samples were female dominated (Medvedev et al., 2018; Schut & Boelen, 2017; Slonim et al., 2015; Soysa & Wilcomb, 2015). Moreover, all those studies except for one (Schut & Boelen, 2017) employed a cross-sectional design and thus a causal relationship cannot be inferred. Despite the absence of a confirmed causal relationship, findings of the protective role of mindfulness against depression were consistent among university students. However, given that the studies assessing this protective role of mindfulness against depression in nursing and medical students were few, and since nursing and medical students were found to be at increased risk for depression, more studies are needed to determine the relationship between depression and mindfulness in this population. Contributing to knowledge in this key area can therefore help formulate interventions to improve the psychological well-being of these future healthcare professionals.

Compared to international literature, studies which investigated the role of mindfulness in improving the psychological well-being of individuals in the Arab region are few. Thomas et al. found that mindfulness-based stress reduction program (MBSR) was effective in reducing depressive symptoms and stress reactivity levels in UAE college students (2016). This is consistent with international research where mindfulness interventions/trainings were effective in reducing psychological symptoms (Keng et al., 2011). As for dispositional mindfulness, studies found DM to be a strong predictor of positive affect scores in university students (El-Nabulsi, 2015). Also, DM was associated with improved psychological well-being in different populations including lower levels of anxiety, stress, and depression in parents of children who have autism (Rayan & Ahmad, 2018), improved quality of life in patients diagnosed with schizophrenia and depression (Rayan, 2017), and decreased psychological distress in women diagnosed with breast cancer (Al-Ghabeesh et al., 2019). In Lebanon, a recent study showed that DM was negatively correlated with depression in a sample of university students (Safieddine, 2020). The studies done in different Arab countries addressed mindfulness in different populations, such as parents, cancer patients, and patients suffering from mental disorders. All of these studies reached a similar conclusion on the helpful role of mindfulness, reflecting that mindfulness has the potential of becoming an effective tool in assisting individuals in dealing with their stressors. However, each of these studies assessed the effect of mindfulness on a different outcome (depression, anxiety, quality of life, and psychological distress). Additionally, none of the studies in these populations were replicated, and so more evidence might be needed to support the role of mindfulness. Lastly, the sample of students in the study done in Lebanon came from the American

University of Beirut; however, the backgrounds of these students were heterogenous, where they had different majors and thus slightly different experiences which do not necessarily align with the experiences of nursing and medical students who are exposed to increased stressors from clinical trainings.

Despite DM being studied in different populations in the Arab region, to our knowledge only three studies investigated mindfulness in our population of interest (Al-Zahrani et al., 2020; Rayan, 2018). Mindfulness meditation was found to be more effective than physical exercise in managing depression among nursing students (Alsarairah & Aloush, 2017). It should be noted though that mindfulness meditation has not been compared to other empirically tested treatment regimens in this region, and thus the extent of the conclusions pertaining to its effectiveness is limited in the Arabic context. Adding on, mindfulness meditation differs from dispositional mindfulness, where the latter is a trait. On the other hand, Rayan found that DM accounted for 13% of variance in stress in nursing students (2018). Also, Al-Zahrani et al. (2020) investigated the correlation between mindfulness and depression and concluded that mindfulness significantly predicted depression among medical students. This recent study provides promising insight on the role of mindfulness and its possible future application in interventions; however, more studies would be needed to reach more robust conclusions about this role of mindfulness in this population. Lastly, several recent studies found mindfulness to be positively correlated with resilience, and negatively correlated with depression in university students (AlHarbi et al., 2021; Dhar et al., 2019; Neelramban et al., 2015).

D. Resilience

The definition of resilience varies between different studies. A recent systematic review examined the definitions of resilience in healthcare professionals (Robertson et al., 2016). Previously, resilience was limited to avoiding burnout in the workplace; however, both professional and personal resilience are more than not ‘burning out’ (Robertson et al., 2016). Other definitions of resilience described it as a complex phenomenon relating to an individual’s ability to overcome or bounce back from adversity (Edwards et al., 2014; Hegney et al., 2015; Li & Hasson, 2020; Neufeld & Malin, 2019; Rahimi et al., 2014; Windle, 2011), the ability to successfully adapt or recover from traumatic or stressful events (Bacchi & Licinio, 2017; De Oliveira et al., 2017; Rios- Riquez et al., 2016; Zhao et al., 2016; Ziaian et al., 2012), the ability to be flexible and moderate the undesirable effects of stress (Cheng et al., 2019; Lin et al., 2019; Taku, 2013), and to remain healthy despite exposure to negative experiences (Peng et al., 2012; Shi et al., 2015). Though the above definitions might appear to be close to each other, ‘bouncing back’ is not the same as ‘adapting.’ The definition of resilience adopted in this study follows Rees et al. (2015), which combines those concepts, and defines resilience as: “the ability of a person to recover, re-bound, bounce-back, adjust or even thrive following misfortune, change or adversity” (p. 2). Despite that resilience has trait-like characteristics, it has been theorized to be a malleable construct which can be improved through targeted interventions (Mcdermott et al., 2020). Thus, investigating the possible protective role of resilience against negative psychological outcomes might assist in formulating interventions that address it, and thus improve the psychological outcomes of the targeted population.

Moreover, while resilience can be exhibited by individuals in different populations (refugees, individuals post war), research has specifically addressed resilience in healthcare professionals and nursing/medical students. Studies showed that resilience was associated with psychological wellbeing and decreased academic burnout in undergraduate nursing students (Beauvais et al., 2014; Rios- Risquez et al., 2016; Zhao et al., 2016). Similar conclusions were reported in medical students where resilience was found to moderate the effect of academic and negative life events on depression (Cheng et al., 2019; Peng et al., 2011), to moderate the effect of stress on physical health (Lin et al., 2019; Tempski et al., 2015), and to mediate the relationship between positive personality traits and decreased anxiety in medical students (Shi et al., 2015).

Considerable attention was also given to the protective role of resilience against depression in nursing and medical students, especially given the negative effects of depression on this population. A longitudinal study showed that higher baseline resilience scores predicted better psychological well-being at the time of follow-up in nursing students (after 18 months) (Rios-Risquez et al., 2018). Psychological wellness in this study was assessed through the General Health Questionnaire 12 (GHQ-12), which includes depression. However, the relationship between resilience and the depression subscale specifically was not reported. Another cross-sectional study also utilized GHQ-12 and found a similar negative correlation between its total score and resilience in nursing students (Smith & Yang, 2017). Furthermore, resilience was found to be negatively associated with depression in nursing (Devi et al., 2021; Mcdermott et al., 2020) and medical students (Peng et al., 2012; Tafoya et al., 2018; Zhao et al., 2021). These studies, except for the study by Tafoya et al., employed a cross-sectional design and so no

directional relationship can be ascertained between depression and resilience. Also, all the above cited studies, except for studies by Mcdermott et al. (2020) and Zhao et al. (2021), employed a convenience sampling design which limits the generalizability of the findings concerning the role played by resilience in the population of nursing and medical students. In all, these studies concluded that resilience is an important resource for the psychological well-being of students. However, the study by Lin et al. found that resilience did not protect against the psychological demands of medical school, which was identified as a risk factor for compassion fatigue in medical students (2019). However, resilience was still found to be protective against compassion fatigue in this study (Lin et al., 2019). The authors argued that it might have been easier for the students to ‘bounce back’ from the stressors of the physical demands rather than the psychological demands, which both constitute a risk for compassion fatigue (Lin et al., 2019). Also, another study found the correlation between resilience and depression to be insignificant in university students, which contradicts findings of previous studies (Neelramban, 2015). This contradictory finding is further explained in a following section. Overall, there are numerous studies that investigate resilience with different psychological outcomes. However, we cannot generalize the protective role of resilience on different psychological outcomes such as compassion fatigue, academic burnout, or physical health to another specific outcome which is depression. Therefore, further studies are needed to provide a deeper understanding of the role played by resilience on depression in nursing and medical students.

In the Arab region, most studies on resilience focused on the resilience of people during or post war, and of refugees. In these studies, resilience was found to be negatively correlated with psychological distress (Arnet et al., 2013; Thabet & Thabet, 2015) and with

Post Traumatic Stress Disorder (PTSD) (Alghamdi, 2020; Wright et al., 2016). Studies assessing for resilience in university students found resilience to be positively correlated with positive psychological adaptation (Alsadi & Drabie, 2020), with mental health (Rudwan & Alhashimia, 2018), and with post traumatic growth (Thabet et al., 2015). Also, resilience was found to partially mediate the relationship between mindfulness and life satisfaction in university students (Younes & Alzahrani, 2018).

Very few studies were done on nursing or medical students in the region. A study on nurses found resilience to be negatively correlated with depersonalization, and positively associated with personal accomplishment, optimism, hope and self-efficacy (Metwaly et al., 2018). A more recent study also found resilience to be correlated with better academic performance in nursing students (Grande et al., 2021). In medical students, higher levels of resilience were associated with increased life satisfaction and happiness (Aboalshamat et al., 2018). These studies highlighted the need for intervention programs that target enhancing resilience in nurses and medical students (Aboalshamat et al., 2018; Grande et al., 2021; Metwaly et al., 2018). Studies done in the Arab region are not enough to reach conclusive results about the overall role of resilience in impacting psychological wellbeing. The concept of resilience is not unified between these studies, where it is especially interpreted uniquely in Palestine (Marie et al., 2017). As for the relationship between resilience and depression, studies done in the region are scarce. A very recent study however showed a significant negative correlation between resilience and depression (Alharbi et al., 2021). Another study found similar results where higher depression levels were associated with lower resilience in students, and depression and social support predicted 30% of the variance in resilience scores (Hamdan-Mansour et al., 2014). These

results thus far show the positive potential of targeting resilience to improve the psychological well-being, especially depression in our population of interest.

E. Relationship between Depression, Mindfulness & Resilience

Few studies assessed the relationships among depression, mindfulness, and resilience in students (Alharbi et al., 2021; Dhar et al., 2019; Neelarambam, 2015; Rees et al., 2015). Alharbi et al. (2021) and Dhar et al. (2019) assessed the correlations between mindfulness, resilience and depression without making any propositions regarding the mechanism of the relationship among these variables. Findings showed that resilience and mindfulness were positively correlated with each other, negatively correlated with depression, and they strongly contributed to the overall variance of psychological distress (depression, anxiety and stress).

Two other studies predicted that negative psychological outcomes such as depression, compassion fatigue, burnout, anxiety, and stress are related to psychological constructs such as mindfulness, self-efficacy, coping, and neuroticism, via the mediating role of resilience (Heritage et al., 2019; Rees et al., 2016). Rees et al. (2016) investigated this correlation on 422 third-year nursing students across Australia and Canada. A more recent study assessed these correlations in another sample of 708 nursing students (Heritage et al., 2019). The results of both studies supported the proposed correlations between the psychological constructs, psychological outcome, burnout, and the mediating role of resilience. Though these studies had a large sample size, and assessed for different psychological constructs thus controlling for potential confounding variables, still the only psychological outcome investigated was burnout, not depression.

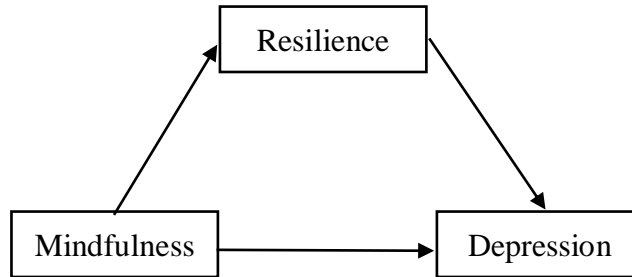
On the other hand, Neelarambam (2015) found mindfulness to mediate the relationship between resilience and depression. This study, however, investigated this correlation in a convenience sample of university students and its results were not further replicated.

Studies supporting the mediating role of resilience between depression and mindfulness were lacking. However, the two studies confirming the mediation resilience plays between mindfulness and burnout had several advantages: 1- had a more representative sample 2- controlled for several psychological constructs (i.e. neuroticism, self-efficacy, & coping) in comparison to the study by Neelarambam (2015) 3- were done in our population of interest, nursing students. Moreover, it is important to note that burnout and depression are strongly correlated (Schonfeld et al., 2015), and thus it might be probable that the mediating role resilience played between mindfulness and burnout also applies to the relationship between mindfulness and depression. These proposed relationships were further supported by Rees et al's study which hypothesized this role of resilience based on large-scale multisite studies on nurses (Hegney et al., 2013, 2014 a,b; Drury et al., 2014).

Therefore, this study will investigate depression in nursing and medical students, and examine its relationships with mindfulness and resilience. It is expected that mindfulness is negatively correlated with depression, and that resilience mediates this relationship.

Figure 1

Proposed Relationships among Variables



CHAPTER III

AIMS AND HYPOTHESIS

A. Purpose & Aims of the Study

The primary purpose of the study was to investigate depression in Lebanese nursing and medical students and the relationship between depression, dispositional mindfulness, and resilience at a Major University in the capital Beirut. The specific aims of this study are:

1. Describe levels of depression, resilience and dispositional mindfulness in undergraduate nursing students and medical students at a major Lebanese university (AUB).
2. Describe the relationships between depression, resilience, and dispositional mindfulness adjusting for participants' background characteristics.
3. Determine the role of resilience as mediator between dispositional mindfulness and depression.

B. Study Hypothesis

1. Hypothesis 1

There is a significant association between depression, mindfulness and resilience, after controlling for gender, major, age, and living status.

2. Hypothesis 2

Resilience is expected to significantly mediate the relationship between mindfulness and depression.

CHAPTER IV

METHODS

A. Research design

This study was a cross-sectional descriptive correlational survey study. The study described the levels of depression, resilience, and dispositional mindfulness in nursing and medical students. It also described the correlation between these variables and investigated the role of resilience as a mediator between dispositional mindfulness and depression. Extraneous variables that were controlled for were student's demographics (age, gender, and living arrangement), major (nursing or medicine) and year of study (first, second, third or fourth).

B. Sample Size, Selection & Recruitment Method

The sample was a convenience sample of undergraduate nursing and medical students at the American University of Beirut (AUB). In the academic year 2020- 2021, the number of students in the undergraduate nursing program was at 197 students and the number of medical students was 451 students at AUB (AUB Facts & Figures, 2020). The inclusion criteria for undergraduate nursing and medical students were that they were full-time students and above the age of 18 years old. Sample size was calculated based on aim 1 using a 98.3% (100%-5%) confidence interval for a mean since we have three variables in aim 1 (depression, mindfulness and resilience). Using a margin of error of 2.5 with an SD

of 7 (based on the study Chamberlain et al., 2016), a minimum of 179 subjects was required.

Following obtaining approval from AUB International Review Board (IRB), an email that included the consent form and surveys was sent to all nursing and medical students to invite them to participate in the study. A weekly reminder was sent for a total of three times.

C. Research Instruments

The language of instruction at the American University of Beirut is English. For this reason, all the instruments were presented in the English Language.

A sociodemographic questionnaire was utilized to assess for age, gender, living arrangement and year of study.

1. Depression: Patient Health Questionnaire-9 (PHQ-9)

PHQ-9 is one of the most used questionnaires to assess for depressive symptoms and their severity. It consists of nine items where each is assigned a score of 0, 1, 2 and 3, to the responses of “not at all,” “several days,” more than half of the days,” and “nearly every day” respectively. Total scores for PHQ-9 range from 0 to 27. PHQ-9 is a valid and reliable measure of depression severity. Although there have been several cut-off scores that were suggested for depression (Costantini et al., 2020), we used the cut-off of 12 for having the best specificity and sensitivity in Arab populations (Al-Ghafri et al., 2014; Kronfol et al., 2018). Also, three recent studies done on samples of medical students at AUB (Talih et al., 2018), at the Lebanese University (Naja et al., 2016), and on university

students from AUB and a university in Qatar (Kronfol et al., 2018) utilized the PHQ-9 to assess for depression. Furthermore, it has been deemed that PHQ-9 has good psychometric properties and can be used to measure depression in the Lebanese population (Sawaya et al., 2016).

2. Dispositional Mindfulness: Cognitive and Affective Mindfulness Scale Revised (CAMS-R)

The CAMS-R is a 10-item scale used to measure dispositional mindfulness. The scale captures a broad conceptualization of mindfulness and is based on the work of Kabat-Zinn (Sauer et al., 2013). The scale contains four subsets which are mindfulness domains (attention, present focus, awareness and acceptance) but can also be used as a total score. It follows a four-point Likert scale from 1 (Rarely/Not at all) to 4 (Almost Always). The scores range between 10 and 40. CAMS-R has shown good internal consistency ($\alpha=0.81$) and convergent and discriminant validity using a student sample (Feldman et al., 2007). It has also been shown to have significant correlations with two other widely accepted mindfulness measures, Mindfulness Attention Awareness Scale (MAAS) and the Freiburg Mindfulness Inventory (Feldman et al., 2007). The scale has been used in a recent study that explored the relationships between mindfulness and other constructs in nursing students and showed good internal consistency of $\alpha 0.8$ (Rees et al., 2016). The manual of use indicates that only the score for CAMS-6 “I am easily distracted” is reversed, and then the sum of all the values would be computed where higher scores reflect greater mindful qualities (Feldman et al., 2007). A cut-off score of 31 was considered to indicate

high mindfulness in a recent study of dispositional mindfulness in healthcare professionals, with a reliability of 0.7 to 0.74 (Lebares et al., 2018).

3. Resilience: Connor-Davidson Resilience Scale (CD-RISC10)

The CD-RISC10 is a widely used scale to measure self-perceived psychological resilience. It explains the concept of resilience and has been validated and used across samples of nurses (Chana et al., 2015; Garcia & Calvo, 2011; Gillespie, Chaboyer et al., 2007), nursing students (Chamberlain et al., 2016; Konget al., 2016; Li, Cao et al., 2014) and medical students (Carter at al., 2016; Houpy et al., 2017; Rahimi et al., 2014). Furthermore, CD-RISC has been utilized to study resilience following disasters of natural causes and environmental incidents, such as Deep-Water Horizon oil spill (Grattan et al., 2011), hazardous waste operations and emergency response (Calcote, 2012) and the earthquake in Turkey (Ahmad et al., 2010). CD-RISC was originally developed as a 25-item scale but has been found by factor analysis to be multidimensional. It was then developed into a new version with 10 items (CD-RISC 10) which was shown to purely measure the construct of resilience. The ten items of resilience scale are distributed under 5 main subscales which are flexibility, self-efficacy, emotion-regulation, optimism, and cognitive focus. Also, CD-RISC 10 has shown excellent psychometric properties where it demonstrated good internal consistency (Cronbach's alpha= 0.8) and construct validity (Campbell-Sills & Stein, 2007). Given its proven efficiency in measuring resilience as a pure construct and considering that we will be measuring conceptually similar concepts, CD-RISC 10 would help prevent criterion-predictor contamination. As for its use, each item is scored from 0-4, and the scoring of the scale is based on the sum of all the items.

Therefore, the full range is from 0 to 40, with higher scores reflecting higher resilience (Davidson, 2020). The median score of CD-RISC-10 in US population was found to be 32 with lowest quartile being 0-29, and highest quartile being 37-40 (Campbell-Sills et al., 2009).

D. Ethical Considerations

This study was approved by the International Review Board (IRB) at the American University prior to data collection. Students had to agree to the consent form before they were directed to the online survey study. The informed consent described the research topic briefly and ensured the voluntary nature of participation, and that there was no direct benefit from their participation. The informed consent also referred students to contact the counselling center at AUB if they had experienced any distress during or after their participation. Information that identified participants directly was not collected and confidentiality of data was maintained through-out the study.

E. Data Analysis

Data was entered to SPSS-Version 23 for analysis. Descriptive statistical analysis was used to describe the sample demographics for both nursing and medical students. Age was summarized in terms of mean and standard deviation. Gender (male, female, other), living arrangement (with family, alone, with friends), major (nursing or medicine) and year of study (first, second, third, fourth) were summarized in terms of percentage.

For aim one, descriptive statistics was conducted on the levels of depression, resilience, and dispositional mindfulness in nursing and medical students. Data was summarized through means and standard deviations, medians, and minimum/maximum.

For aim two, Pearson's correlation coefficients were computed to determine the bivariate associations between the main study variables, depression, mindfulness and resilience. Multiple linear regression was carried out to determine the adjusted associations between depression and study variables. Variables that had a p-value < 0.2 at the bivariate level were entered into the multivariable model. The assumptions of multiple regression in terms including collinearity and normality of the residuals were checked. A Variance Inflation Factor (VIF) more than 5 was considered indicative of collinearity. A histogram of the residuals was inspected for normality.

For aim three, mediation analysis was done following Baron and Kenny's method. Four regressions were conducted. The first is related to the relation between the independent variable and the dependent variable. The second is related to the relation between the independent variable and the mediator. The third is related to the relation between the mediator and the dependent variable, adjusting for the independent variable. Lastly, the fourth regression is for the relation between the independent variable and the dependent variable adjusting for the mediator. Mediation is ascertained to be present if the relationship between IV and DV changes after the mediator is in the model.

CHAPTER V

RESULTS

A. Descriptive Statistics

A total number of 135 responses were received out of 197 nursing students and 451 medical students. 5 of these responses were empty and thus removed from analysis. Demographic characteristics of the sample are described in Table 1. Of the 130 students, the highest proportion were nursing students (n= 82, 63.1%) in comparison to medical students (n= 48, 36.9%), females (n= 94, 72.3%), and were living with their family (n= 103, 79.2%). Of the responses received from nursing students, 23.1% of the students were in class of BSN II (n= 30), 28.5% in BSN III (n= 37) and 11.5% in BSN IV (n= 15). As for medical students, the majority were Med 3 students (n= 30, 23.1%), followed by Med 4 students (n= 13, 10%), Med 1 students (n=4, 3.1%), and only 1 student from Med 2 (0.8%). The mean age of participants was 21 years (SD= 2.14).

Table 1:*Descriptive Characteristics of Study Sample*

Variable	N	% (valid)
Gender		
Male	36	27.7
Female	94	72.3
Major		
Nursing	82	63.1
BSN II	30	23.1
BSN III	37	28.5
BSN IV	15	11.5
Medicine	48	36.9
Med 1	4	3.1
Med 2	1	0.8
Med 3	30	23.1
Med 4	13	10.0
Living Arrangements		
With family	103	79.2
Alone	18	13.8
With friends	8	6.2
Other	1	0.8

Levels of depression, resilience, and mindfulness were summarized for the total sample and compared between nursing and medical students. Summaries of each item in the Depression, Resilience, and Mindfulness instruments are presented in Tables 2.1, 2.2, and 2.3 respectively. Summaries of their respective total scores are presented in Tables 2.4, 2.5, and 2.6.

1. Depression

A total of 123 students completed the PHQ-9 questionnaire. The average score of depression was 7.64 (SD= 5.72), which suggests mild depressive symptoms as per the PHQ-9 guidelines. The minimum and maximum scores were 0 and 27. The frequency of participants that screened positive for depression (PHQ \geq 12) was 21.1%. The highest means were 1.25 (SD= 0.83) and 1.07 (SD= 0.87) corresponding to the items assessing for fatigue and anhedonia respectively. On the other end, the lowest means were 0.32 and 0.43 for the items assessing for suicidal ideations (SD= 0.72) and slow/restless motion (SD= 0.75) respectively.

Table 2.1:

Levels of Depression for Total Sample

	Not at All N (%)	Several days	More than half the days	Nearly every day	Mean +/- SD
Little interest or pleasure in doing things	31 (25.3)	61 (49.6)	20 (16.3)	11 (8.9)	1.09 +/- 0.87
Feeling down, depressed or hopeless	30 (24.4)	73 (59.3)	12 (9.8)	8 (6.5)	0.98 +/- 0.77
Trouble falling or staying asleep, or sleeping too much	49 (39.8)	37 (30.1)	20 (16.3)	17 (13.8)	1.04 +/- 1.05
Feeling tired or having little energy	20 (16.3)	63 (51.2)	29 (23.6)	11 (8.9)	1.25 +/- 0.83
Poor appetite or overeating	46 (37.4)	45 (36.6)	19 (15.4)	13 (10.6)	0.99 +/- 0.97

Feeling bad about yourself- or that you are a failure or have let yourself or your family down	57 (46.3)	40 (32.5)	19 (15.4)	7 (5.7)	0.80 +/- 0.91
Trouble concentrating on things, such as reading the newspaper or watching television	62 (50.4)	42 (34.1)	9 (7.3)	10 (8.1)	0.73 +/- 0.91
Moving or speaking so slowly that other people could have noticed. Or the opposite- being so fidgety or restless that you have been moving around a lot more than usual	85 (69.1)	28 (22.8)	5 (4.1)	5 (4.1)	0.43 +/- 0.75
Thoughts that you would be better off dead, or of hurting yourself	99 (80.5)	13 (10.6)	7 (5.7)	4 (3.3)	0.32 +/- 0.72

2. *Dispositional Mindfulness:*

For mindfulness, 117 students completed the respective scale. The average score of mindfulness was 26.2 (SD= 5.67). The minimum score was 14, and the maximum score was 39. Higher scores suggest greater mindful qualities. The highest means corresponded to the item “It is easy for me to concentrate on what I am doing” under the domain of Attention (Mean= 2.77, SD= 0.85) and to two items with equal means (Mean= 2.73), item “I am able to focus on the present moment” (SD= 0.85) under domain of present focus and item “I am able to accept the thoughts and feelings I have” (SD= 0.88) under domain of acceptance.

Table 2.2:*Levels of Mindfulness for Total Sample*

	Rarely/ Not at All (1) N (%)	Some- times (2)	Often (3)	Almost Always (4)	Mean +/- SD
Attention					
CAMS-R1: It is easy for me to concentrate on what I am doing	7 (6.0)	38 (32.5)	47 (40.2)	25 (21.4)	2.77 +/- 0.85
CAMS-R6: I am easily distracted (R)	19 (16.2)	55 (47.0)	31 (26.5)	12 (10.3)	2.69 +/- 0.86
CAMS-R12: I am able to pay close attention to one thing for a long period of time	10 (8.5)	48 (41)	39 (33.3)	20 (17.1)	2.59 +/- 0.87
Present Focus					
CAMS-R11: I am able to focus on the present moment	6 (5.1)	45 (38.5)	41 (35.0)	25 (21.4)	2.73 +/- 0.85
Awareness					
CAMS-R5: I can usually describe how I feel at the moment in considerable detail	24 (20.5)	40 (34.2)	37 (31.6)	16 (13.7)	2.38 +/- 0.96
CAMS-R8: It's easy for me to keep track of my thoughts and feelings	9 (7.7)	47 (40.2)	41 (35)	20 (17.1)	2.62 +/- 0.85
CAMS-R9: I try to notice my thoughts without judging them	13 (11.1)	58 (49.6)	33 (28.1)	13 (11.1)	2.39 +/- 0.83
Acceptance					
CAMS-R3: I can tolerate emotional pain	12 (10.3)	37 (31.6)	43 (36.8)	25 (21.4)	2.69 +/- 0.92
CAMS-R4: I can accept things I cannot change	10 (8.5)	41 (35.0)	41 (35.0)	25 (21.4)	2.69 +/- 0.90
CAMS-R10: I am able to accept the thoughts and feelings I have	8 (6.2)	42 (35.9)	41 (31.5)	26 (22.2)	2.73 +/- 0.88

3. Resilience:

For resilience, 117 students completed its respective scale. The average score for resilience was 26.1 (SD= 7.41). The minimum score was 10 and the maximum score was 40 which is the highest attainable score. Higher scores reflect greater resilience, and lower scores reflect more difficulty in bouncing back from or thriving during adversity. The highest two means were 2.96 (SD= 0.88) and 2.71 (SD= 0.91). These means respectively corresponded to the item assessing for one's belief that they can achieve goals despite obstacles in the subscale of optimism, and the other for the item assessing for adaptability during changes under the subscale of flexibility. The lowest means belonged to the item assessing whether one is easily discouraged by failure in the subscale of Optimism (Mean= 2.35, SD= 1.03) and being able to stay focused and think clearly while pressured which falls under the subscale of cognitive focus (Mean= 2.44, SD= 1.03).

Table 2.3:

Levels of Resilience for Total Sample

	Not True at All (0) N (%)	Rarely true (1)	Some-times true (2)	Often true (3)	True nearly all the time (4)	Mean +/- SD
<i>Flexibility</i>						
I am able to adapt when changes occur	1 (0.9)	10 (8.5)	34 (29.1)	48 (41.0)	24 (20.5)	2.72 +/- 0.91
I tend to bounce back after illness, injury, or other hardships	4 (3.4)	12 (10.3)	28 (23.9)	43 (36.8)	30 (25.6)	2.71 +/- 1.06
<i>Self-efficacy</i>						

I can deal with whatever comes my way	0 (0)	12 (10.3)	36 (30.8)	49 (41.9)	20 (17.1)	2.66 +/- 0.88
Having to cope with stress can make me stronger	6 (5.1)	9 (7.7)	41 (35.0)	37 (31.6)	24 (20.5)	2.55 +/- 1.06
I think of myself as a strong person when dealing with life's challenges and difficulties	2 (1.7)	14 (12.0)	30 (25.6)	41 (35.0)	30 (25.6)	2.71 +/- 1.03
Emotion-regulation						
I am able to handle unpleasant or painful feelings like sadness, fear, and anger	4 (3.4)	15 (12.8)	41 (35.0)	37 (31.6)	20 (17.1)	2.46 +/- 1.03
Optimism						
I try to see the humorous side of things when I am faced with problems	6 (5.1)	15 (12.8)	32 (27.4)	33 (28.2)	31 (26.5)	2.58 +/- 1.16
I believe I can achieve my goals, even if there are obstacles	0 (0)	8 (6.8)	24 (20.5)	50 (42.7)	35 (29.9)	2.96 +/- 0.88
I am not easily discouraged by failure	3 (2.6)	22 (18.8)	41 (35.0)	33 (28.2)	18 (15.4)	2.35 +/- 1.03
Cognitive focus						
Under pressure, I stay focused and think clearly	4 (3.4)	18 (15.4)	35 (29.9)	42 (35.9)	18 (15.4)	2.44 +/- 1.03

4. Comparing Main Variables between Nursing and Medical Students:

Significant differences were found between nursing and medical students on the levels of depression, resilience and mindfulness. Results are demonstrated in tables 2.5, 2.6 and 2.7. Eighty-two nursing students and 45 medical students completed the PHQ-9 scale. The mean of depression in nursing students (\bar{x} =8.73, SD= 6.08) was significantly higher than

the mean in medical students (\bar{x} = 5.75, SD= 4.50) on the bivariate levels, $t= 2.547$, $p< 0.05$. This aligns with the difference in prevalence of depression (PHQ> 12) between the two groups where the prevalence of depression was 25.6% in nursing students (N= 20) which is higher than the prevalence in medical students (13.3%, N= 6).

For resilience and mindfulness, 73 nursing students and 44 medical students completed their respective scales. The mean of resilience in nursing students (\bar{x} = 24.8, SD= 7.83) was significantly lower than resilience in medical students (\bar{x} = 28.25, SD= 6.19), $t= - 2.444$, $p< 0.05$. On the other hand, the difference in mindfulness between nursing students (\bar{x} = 25.8, SD= 5.61) and medical students (\bar{x} = 26.9, SD= 5.76) was not significant, $t= -1.030$, $p> 0.05$.

Table 2.4:

Summary of Total Scores of Variables for Total Sample

Variable	Mean	Median	Min/Max	SD
Depression (0-27)	7.64	6.00	0/27	5.72
Mindfulness (10-40)	26.2	26.0	14/39	5.67
Resilience (0-40)	26.1	27.0	10/40	7.41

Table 2.5:

Summary of Total Scores of Variables for Nursing Students

Variable	Mean	Median	Min/Max	SD
Depression (0-27)	8.73	7.00	0/27	6.08
Mindfulness (10-40)	25.8	26.0	14/39	5.61
Resilience (0-40)	24.8	24.00	10/40	7.83

Table 2.6:*Summary of Total Scores of Variables for Medical Students*

Variable	Mean	Median	Min/Max	SD
Depression (0-27)	5.75	5.00	0/17	4.50
Mindfulness (10-40)	26.9	26.5	14/39	5.76
Resilience (0-40)	28.25	28.00	12/40	6.19

Table 2.7:*Independent Samples T-Test Comparing Nursing and Medical Students for the Following Variables*

	T	df	p-value	Mean Difference
Depression	2.857	121	0.005	2.975
Mindfulness	- 1.030	115	0.305	-1.114
Resilience	- 2.444	115	0.016	- 3.386

B. Correlational Analysis

Table 3.1 summarizes the Pearson correlational analysis between depression, resilience, and mindfulness for the total sample. Depression was found to be significantly and negatively correlated with resilience ($r = -0.397$, $p < 0.01$) and with mindfulness ($r = -0.453$, $p < 0.01$). Moreover, resilience and mindfulness were significantly and positively correlated with each other ($r = 0.719$, $p < 0.01$).

The correlation between depression, resilience and mindfulness in the group of nursing students alone and medical students alone remained significant in sub-group analysis as in the combined sample. Tables 3.2 and 3.3 summarize the Pearson's correlational analysis between these variables in nursing students and medical students respectively. Depression was found to be significantly and negatively correlated with resilience in nursing students

($r = -0.293$, $p < 0.05$) and medical students ($r = -0.406$, $p < 0.01$). Depression was also significantly and negatively correlated with mindfulness in nursing ($r = -0.278$, $p < 0.05$) and medical students ($r = -0.563$, $p < 0.01$). Moreover, resilience and mindfulness were significantly and positively correlated with each other in the two groups ($r = 0.134$, $p < 0.01$ for nursing students and $r = 0.800$, $p < 0.01$ for medical students).

Table 3.1:

Correlations for Total Sample

	Depression	Mindfulness	Resilience
Depression	1		
Mindfulness	-0.453**	1	
Resilience	-0.397**	0.719**	1

** $p < 0.01$.

Table 3.2:

Correlations for Nursing Students

	Depression	Mindfulness	Resilience
Depression	1		
Mindfulness	-0.278*	1	
Resilience	-0.293*	0.734*	1

* $p < .05$. ** $p < 0.01$.

Table 3.3:

Correlations for Medical Students

	Depression	Mindfulness	Resilience
Depression	1		
Mindfulness	-0.563**	1	
Resilience	-0.406**	0.800**	1

** $p < 0.01$.

C. Regression Analysis

Multiple linear regression analysis with depression as dependent variable was used to address the second aim. The independent variables considered were resilience, mindfulness, and demographic variables (age, gender, major and living status). Variables were entered into the multivariable regression model if they had a p-value < 0.2 in the unadjusted analysis. Residual analysis revealed three outliers; these were inspected, and the analysis was run twice with and without the outliers (Tables 4.1 and 4.2 respectively). In the unadjusted analysis without outliers, resilience (B= -0.257), mindfulness (B= - 0.379), age (B= - 0.431), gender (B= -2.160) and major (B= - 2.244) appeared to significantly predict depression scores. In the adjusted analysis, only mindfulness remained significant in predicting depression scores by which for every one unit increase in mindfulness, depression score was expected to decrease by 0.312 (CI (-0.533, -0.091), $p < 0.01$). The variables resilience, mindfulness, age, gender & major accounted for 20% of the variance in depression scores (Adjusted $R^2 = 0.2$).

Table 4.1:

Regression Analysis with Outliers

Variable	Unadjusted		Adjusted	
	B	95% CI	B	95% CI
Resilience	- 0.274**	(-0.406; -0.142)	- 0.094	(-0.300; 0.112)
Mindfulness	- 0.374**	(-0.545; -0.202)	- 0.262	(-0.528; 0.004)
Age	- 0.573*	(-1.017; -0.56)	0.120	(-0.686; 0.927)
Gender	- 2.008	(-4.233; 0.218)	0.011	(-2.259; 2.282)
Major	- 2.975**	(-5.037; -0.914)	- 2.600	(-6.133; 0.933)
Living Status	0.356	(-1.295; 2.006)		
Adjusted R2	0.150			

* $p < 0.05$. ** $p < 0.01$.

Table 4.2:

Regression Analysis without Outliers

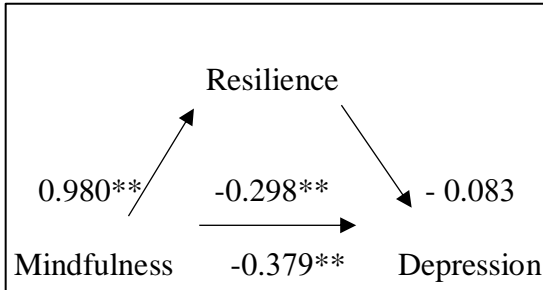
Variable	Unadjusted		Adjusted	
	B	95% CI	B	95% CI
Resilience	- 0.257**	(-0.368, -0.146)	- 0.051	(-0.223, 0.122)
Mindfulness	- 0.379**	(-0.519, -0.240)	- 0.312**	(-0.533, -0.091)
Age	- 0.431*	(-0.845, -0.018)	- 0.050	(-0.713, 0.613)
Gender	- 2.160*	(-4.072, -0.247)	- 0.483	(-2.317, 1.404)
Major	- 2.244*	(-4.031, -0.458)	- 1.135	(-4.066, 1.795)
Living Status	- 0.574	(-2.037, 0.889)		
Adjusted R2	0.200			

* $p < 0.05$. ** $p < 0.01$.**D. Mediation Analysis**

Mediation analysis using Barron & Kenny's method was performed to address the third aim. The outcome variable for the analysis was depression. The predictor variable for the analysis was mindfulness. The mediator variable for the analysis was resilience. Results of this analysis are presented in Figure 1. The first condition was met by which mindfulness was significantly correlated with depression ($B = -0.379$, $p < 0.01$). The second condition was also met where mindfulness was significantly correlated with resilience ($B = 0.980$, $p < 0.01$). However, the third condition was not met where resilience was not significantly correlated with depression in the presence of mindfulness in the model. Therefore, resilience does not mediate the relationship between mindfulness and depression.

Figure 2

Mediation Analysis



In the light of the above results, the role of mindfulness in mediating the relationship between resilience and depression was then investigated. Results are presented in Figures 3 and 4. For the first condition, a significant relationship was found between resilience and depression ($B = -0.257, p < 0.01$). The second condition was also met where mindfulness was significantly correlated with resilience ($B = 0.573, p < 0.01$). The third condition was met by which mindfulness was significantly correlated with depression despite the presence of resilience in the model ($B = -0.298, p < 0.01$). Finally, for the fourth condition, the relationship between resilience and depression substantially decreased in magnitude and lost its significance when mindfulness was accounted for in the regression model, which supports that mindfulness mediates the relationship between resilience and depression ($B = -0.083, p > 0.05$). These results are affirmed by the Sobel test ($z = -2.714, SD = 0.107, p < 0.01$).

Figure 3

Mediation Analysis- 2

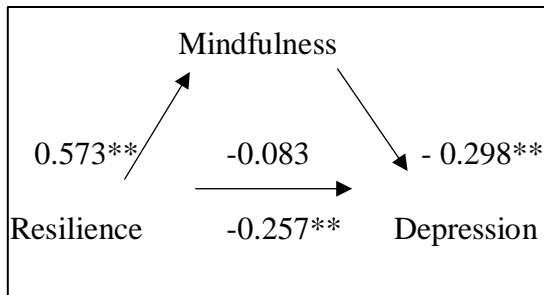


Figure 4

Sobel Test Results

Z-score= - 2.714

Std Error= 0.107

p < 0.01

CHAPTER VI

DISCUSSION

This study examined depression in nursing and medical students and the relationships among depression, mindfulness and resilience after controlling for gender, age, and major. The study also investigated the mediating role of resilience in the relationship between mindfulness and depression.

A. Prevalence of Depression & Its Associated Factors

Few studies have evaluated depression in medical and nursing students in Lebanon and Arab region, especially in regard to the relationship of depression with resilience or mindfulness. The prevalence of depression ($PHQ \geq 12$) in our sample combining nursing and medical students was 21.1%, which is lower than the rates found in previous studies. Medical students at the Saint-Joseph University in Lebanon showed a high prevalence of depression (27.63%) (Mehanna & Richa, 2006). Another study done on medical students at the Lebanese University showed even higher prevalence, where 34.4% of students exhibited depressive symptoms. A similar high prevalence of depression of 34.6% was found in university students of two Arabic countries, Qatar and Lebanon (Kronfol et al., 2018). In addition, compared to global pooled prevalence of depression in nursing students (34%) (Tung et al., 2018) and medical students (27.2%) (Rotenstein et al., 2016), the prevalence found in our sample (21.1%) was also lower. However, the prevalence of depression as per this study is more similar to the prevalence of 23.8% of depression which

was found in a study done in 2016 on medical students at the American University of Beirut, which is the university our sample was selected from (Talih et al., 2017). It is important to note that the study done by Talih et al. (2017) has employed a cut-off score of 10. Employing a more stringent cut-off score in our sample, which aligned with previous recommendation for the Arab region (Al-Ghafri et al., 2014; Kronfol et al., 2018), decreases the likelihood of type I error and thus the overestimation of depression rates in our target population.

It is also notable that the prevalence of depression in our sample was higher than the prevalence of 12.8% of university students in USA (Kronfol et al., 2018). However, the participants' depression levels were assessed within the first year following the massive explosion in Beirut, where AUB is located. This might have also impacted our results since trauma has been shown to contribute to depressive symptoms and disorders (Shalev et al., 1998). Adding on, alarmingly 19.5% of students in our sample reported having suicidal thoughts which is higher than the prevalence of 14.5% found in medical students in the previous study at AUB (Talih et al., 2017). Moreover, the prevalence of suicidal ideations found in our sample was higher than that reported in medical students globally (11%) by a systematic review (Rontenstein et al., 2016). These numbers pose a safety concern and need to be addressed through tailoring interventions for suicide awareness, assessment, and prevention.

Additionally, the prevalence of depression in our sample was higher than the prevalence of depression in the general population, where the lifetime prevalence is 18% in developed countries and 9% in developing countries (Krishnan, 2021). This finding is consistent with international data regarding higher prevalence of depression in nursing and

medical students in comparison to general population (Rontenstein et al., 2016; Tung et al., 2018). This could be attributed to the increased stress experienced by medical and nursing students due to the difficult demands in regard to academics and lifestyle (Talih et al., 2017; Tung et al., 2018). This includes the stress of studying, clinical clerkships, frequent exams, and financial stressors (Talih et al., 2017).

The relationship of depression with gender, age, major and living status was not significant in the adjusted regression analysis, as mentioned in the results. In the unadjusted analysis, depression was found to be higher in females in comparison to males, which is consistent with international literature (IHME, 2019; Tam et al., 2019). However, this correlation did not remain significant in the adjusted regression analysis, which could be attributed to the female-dominated sample. For this reason, most studies on nursing students do not separate depression prevalence between males and females (Tung et al., 2018). As for age, older age predicted lower scores of depression in the unadjusted analysis, which is also similar to the trend found in other studies internationally (Puthran et al., 2016; Steptoe et al., 2007). This could be attributed to increased ability to adjust better with workload as students progress through their respective nursing or medical programs (Tung et al., 2018). Age however was also not significant in the adjusted analysis which was the case in a Swedish study conducted on nursing students, who also had a lower mean depression score for older age, but the correlation was not statistically significant (Christensson et al., 2011). These findings are consistent with a recent study done on Lebanese nurses where gender and age were also not found to be significantly correlated with depression (Talih et al., 2018). Another possible explanation for the lack of

significance of age as a predictor of depression might be that there were no major differences in the age groups of the students in our study.

B. Relationships between Depression, Mindfulness and Resilience

The strongest significant predictor of depression was mindfulness. Confirming our hypothesis, mindfulness was negatively associated with depression at both bivariate and multivariate levels. This is consistent with previous literature that examined the relationship between depression and mindfulness (Brown & Ryan, 2003; Cash & Whittingham, 2010, Keng et al., 2011) including a recent study done on Lebanese university students (Safieddine, 2020). This suggests that one's ability to regulate their attention so that it is maintained on immediate experience and one's orientation to experience in the present (Feldman et al., 2007) is correlated with lower depressive symptoms. However, given that the design of the study is cross-sectional, the relationship between mindfulness and depression is not causal, and thus it is also possible that individuals who have lower depressive symptoms are more mindful.

Regarding resilience, it did not significantly predict depression which rejects our hypothesis. Though it was significantly negatively correlated with depression at bivariate level, it did not significantly predict depression in the regression analysis which accounted for other variables. This is inconsistent with the results of previous studies that showed that resilience negatively predicted depression (Simpkin et al., 2018; Cheng et al., 2019; Rossouw et al., 2013). A possible explanation for this finding is that resilience might be negatively associated with a future depressive episode (Wu et al., 2015) but not concurrent depression, such that resilience might increase during a depressive episode to help the

individual cope and it may also prevent future depression. Another important note is that studies (Dyrbye et al., 2010; Loh et al., 2013; Simpkin et al., 2018) that found resilience to be a significant negative predictor of depression analyzed data on a bivariate level. The study at hand used a multivariate analysis, and thus our results might have been different due to accounting for all variables (demographics & mindfulness) when testing for the relationship between depression and resilience. Adding on, another study done on university students found similar results where resilience was not significantly correlated with depression in multivariate analysis (Neelarambam, 2015). However, this latter study was one of the very few that reached this result where the correlation with resilience was insignificant. It is worth noting though, as previously stated, that the other studies mainly assessed for the correlation on a bivariate level. Based on Neelarambam's findings and ours, it might be important that future studies investigate the correlation between resilience and depression on multivariate levels to control for any confounding variables, including psychological constructs, that might affect this correlation.

Findings of our study failed to support our third hypothesis. Resilience did not mediate the relationship between mindfulness and depression. Instead, mindfulness was shown to play this mediator role between resilience and depression. This shows that the effect of resilience on depression is indirect where it occurs through mindfulness. The latter translates into reflecting that when a person is able to thrive during adversity (resilience), they exhibit higher traits of being present and aware of their feelings and thoughts (mindfulness), and this non-judgmental awareness and presence is protective for the individual against depressive symptoms. This supports the integration and use of mindfulness as an important intervention tool to treat depression. These findings are

especially important for nursing and medical students in Lebanon given the extensive external challenges they face while trying to balance their theoretical and clinical training which can put them at increased risk for depression.

Our findings are inconsistent with the hypothesized role of resilience as a mediator between psychological adaptability traits, including mindfulness, and psychological outcomes, including depression, which was proposed by Rees et al. (2015) & Hegney et al. (2019). However, our findings are consistent with another study that found that mindfulness mediates the relationship between resilience and psychological outcomes including depressive and trauma symptoms (Neelarambam, 2015). Rees et al. and Hegney et al. have tested this mediational role of resilience between a group of psychological traits including mindfulness, and one psychological adaptability outcome which was burnout. However, our findings and the findings of Neelaramban show that it is not enough for Rees et al. and Hegney et al. to validate resilience's mediational role by only examining burnout as an outcome and generalizing their findings to other outcomes such as depression. Therefore, to validate the mechanism of the relationships between depression, mindfulness and resilience, more studies are needed to address these variables specifically.

C. Comparison between Nursing and Medical Students

Findings of bivariate analysis showed that depression was significantly more prevalent in nursing than medical students. This is consistent with international literature where the pooled prevalence of depression in nursing students (34%) is higher than that in medical students (27%) (Rotenstein et al., 2016, Tung et al., 2018). This is also consistent with findings from studies done in Lebanon where nurses were also found to have higher

prevalence of depression than medical students (Talib et al., 2018; Talib et al., 2018). Major (nursing or medicine) lost its significance in predicting depression in the multivariable model which might have been due the higher prevalence of nursing students in our study sample. Another possibility is that nursing and medical programs are similar in their demands in regards to both containing theoretical and clinical requirements in the programs. Inversely, lower resilience and mindfulness levels were found in nursing compared to medical students, which aligns with nursing students experiencing higher depression symptoms. As was the case in the combined sample, mindfulness and resilience were both significantly correlated with depression in the bivariate analysis for each of the two groups. This is consistent with previous studies that supported the protective role of mindfulness and resilience against developing negative psychological outcomes.

D. Implications and Future Considerations

Findings of this study supported that nursing and medical students experience higher levels of depressive symptoms than the general population. Also, it showed that resilience was not the mediator but it was rather mindfulness that has mediating effect on the relationship between resilience and depression, thus reflecting the great importance of the role mindfulness plays in psychological adaptability. Future studies might benefit from examining the prospective effects of mindfulness on depression in a longitudinal design. Also, future studies might examine the impact of a mindfulness training program, such as MBCT, MBSR or formal/informal meditation on depressive symptoms of a sample of this population.

Furthermore, it is essential to explore various learnable skills and traits that are potentially protective against depression especially in our context. Counseling departments and the administrations of nursing and medical schools could integrate formal mindfulness trainings into the curriculum of nursing and medical programs. Attending to the counselors' knowledge and trainings would therefore be very important where the practitioners themselves need to develop these mindfulness skills first to be able to teach them to students. This might be especially beneficial for counselors who attend to students suffering from depression and are resistant to traditional cognitive behavioral therapy. An important note is for practitioners to attend to the aspects in which students apply mindfulness in order to assist them in developing their coping strategies. This can include meditation, observing, spiritual practices or other activities. Enhancing the coping abilities of students through mindfulness can therefore decrease their depressive symptoms and improve their overall well-being. Additionally, it is important to acknowledge the importance of teaching mindfulness skills in the long run. This would be a cost-effective intervention where once the skill is learned, it can be applied by the individual for their everyday life. This is especially important for nursing and medical students who thrive in a country of constant instability, where developing such a skill can be essential. Therefore, this could later reflect in greater aspects in the personal and professional lives of these future healthcare professionals.

Also, employing other academic interventions to attend to nursing and medical students' mental health is very important. Anderson (2021) reported a number of interventions that instructors employed during the pandemic to decrease the mental strain on their students. These included: 1- flexibility in deadlines, 2- utilizing technology to

create more interactive class space, increasing students' feelings of belongingness, and 3- alleviating stress caused by lack of resources, such as electricity and internet, by recording lectures and easing the access to educational material. Such measures can serve to help alleviate part of the distress faced by nursing and medical students during these challenging times. In summary, ensuring that these students receive the support needed and employing mindfulness-based interventions in both educational programs and counseling departments can serve as a preventative measure against depression.

CHAPTER VII

LIMITATIONS

This study's findings are to be considered, considering its limitations. The sample of the study was a convenience sample consisting of nursing and medical students at the American University of Beirut. Therefore, the results of the study cannot be generalized to the whole Lebanese population of medical and nursing students. Also, the proportion of nursing to medical students was much higher which might also affect generalizability to medical students. Additionally, it is possible that students who have responded are the ones suffering from depressive symptoms and thus the results need to be interpreted with caution. Moreover, the study employs a cross-sectional design and thus no directional relationships can be ascertained. Furthermore, given that all the scales utilized were self-report measures, this might have affected the results through response bias, despite the anonymity of the participants.

CHAPTER VIII

CONCLUSION

This is the first known study to investigate the relationship between depression, mindfulness and resilience and the mediation between these variables in Lebanon. Findings of this study provide better insight into depression in nursing and medical students, and the role resilience and mindfulness play in regard to depressive symptoms. Contrary to our hypothesis, resilience was not the mediator and mindfulness was found to mediate the relationship depression and resilience. Given that relatively few studies have investigated the mediating role of mindfulness, our findings still need to be ascertained in other student populations. Given the high prevalence of depression in nursing and medical students in comparison to the general population, attending to these future health professionals' mental health should be a priority, and mindfulness trainings can be incorporated into their curriculum and at universities' counseling centers.

APPENDIX A
INVITATION SCRIPT



**AUB Social & Behavioral Sciences
INVITATION SCRIPT**

Invitation to Participate in a Research Study

**This notice is for an AUB-IRB Approved Research Study
for Dr. Laila Farhoud at AUB.**

(Add PI address)

It is not an Official Message from AUB

I am inviting you to participate in a research study about the role of resilience in mediating the relationship between dispositional mindfulness and depression in undergraduate nursing and medical students.

You will be asked to complete a short survey/questionnaire with demographic information and questions about resilience, depressive symptoms, and mindfulness.

You are invited because we are targeting undergraduate nursing and medical students aged 18 and above (you are eligible for this study only if you are 18 and above).

The estimated time to complete this survey is approximately 5 to 10 minutes.

The research is conducted online on LimeSurvey and is hosted on AUB servers.

Please read the consent form and consider whether you want to be involved in the study.

If you have any questions about this study, you may contact Dr. Laila Farhoud at 01-350000 ext 5975, or at lf00@aub.edu.lb.

If interested, kindly follow the link below to the survey:

APPENDIX B

CONSENT FORM

**Consent to participate in an Online Research Study
This notice is for an AUB-IRB Approved Research Study
for Dr Laila Farhoud at AUB.**

It is not an Official Message from AUB

You are invited to participate in a research study entitled “The Role of Resilience in Mediating the Relationship between Dispositional Mindfulness and Depression in Nursing and Medical Students” conducted by Dr Laila Farhoud, Faculty of Nursing at the American University of Beirut. The conduct of this study will adhere to the IRB approved protocol.

The IRB approved method for approaching subjects is Online Surveys through emails. The purpose of the study is to investigate the role of resilience as mediator between dispositional mindfulness and depression in Lebanese undergraduate nursing and medical students at a Major University, AUB, in the capital Beirut.

This message invites you to: Read the consent document and consider whether you want to be involved in the study.

Kindly Note that participation is completely voluntary. Completing the questionnaire will take around 5-10 minutes. Also, Only the data you provide in the questionnaire will be collected and analyzed. The research team will not have access to your name or contact details.

The results of the survey will be published in a –research article/thesis/project report available in printed form and electronically from AUB Libraries.

The inclusion criteria are full time undergraduate nursing students and medical students at any year in their study, above the age of 18 years old.

You will not receive payment or a direct benefit for participation in this study. The results of the study will gather information on the role of resilience for the psychological adaptability of nursing and medical students, in addition to understanding dispositional mindfulness and depression levels in students.

The risks of the study are minimal. You may experience mild distress when answering some of the questions. If the participant experiences emotional distress, the research team advises you to contact AUB counselling center that offers psychosocial support for all students free of charge.

Confidentiality of data will be maintained through-out the study and information that identifies participants directly will not be collected. Electronic files will be stored in the principal investigator's password-secured laptop. Records will be monitored and may be audited by the IRB while assuring confidentiality.

If you voluntarily consent to take part in this study, you can change your mind and withdraw at any time without consequences of any kind.

Refusal to participate or withdrawal from the study will involve no penalty or loss of benefits to you and neither will it affect your relationship with AUB or AUBMC.

If you have any questions about the study, you can contact the research team at: Dr Laila Farhoud, lf00@aub.edu.lb, 01-350000 ext. 5975

If you have concerns about the study or questions about your rights as a participant, you can contact the AUB IRB Office through irb@aub.edu.lb · Telephone: 00961 -1-350000 or 1 374374, ext: 5445

By clicking 'next' you are acknowledging that you understand that participation is voluntary and you agree to participate in the study.

APPENDIX C

DEMOGRAPHICS FORM

- 1- What is your Major?
 - Nursing
 - Medicine
- 2- For Nursing students, what year are you at?
 - BSN II
 - BSN III
 - BSN IV
- 3- For Medical students, what year are you at?
 - Med 1
 - Med 2
 - Med 3
 - Med 4
- 4- What is your gender?
 - Female
 - Male
 - Other
 - Prefer not to answer
- 5- What is your age?
- 6- Where are you living now?
 - With your family
 - Alone
 - With Friends
 - Other

APPENDIX D

PATIENT HEALTH QUESTIONNAIRE – 9 (PHQ-9)

Mental Health

Please answer the following questions as accurately as possible. Remember that your answers are anonymous and cannot be linked to you. If you do not want to provide an answer for any question, you can skip the question at any time.

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly everyday
Little interest or pleasure in doing things	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Feeling down, depressed, or hopeless	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Trouble falling/staying asleep or sleeping too much	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Feeling tired or having little energy	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Poor appetite or overeating	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Feeling bad about yourself or that you are a failure or have let yourself or family down	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday

Trouble concentrating on things, such as reading the newspaper or watching television	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Moving or speaking so slowly that other people could have noticed. Or the opposite: being so fidgety or restless that you have been moving around a lot more than usual	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday
Thoughts that you would be better off dead or hurting yourself in some way	<input type="radio"/> Not at all	<input type="radio"/> Several days	<input type="radio"/> More than half the days	<input type="radio"/> Nearly everyday

If you checked off any of the problems on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Choose one of the following answers

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult

APPENDIX E

CONNOR-DAVIDSON RESILIENCE SCALE – 10 (CD-RISC 10)

*Please indicate how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

	Not True at All (0)	Rarely True (1)	Some- times True (2)	Often True (3)	True Nearly all the Time (4)
I am able to adapt when changes occur.					
I can deal with whatever comes my way					
I try to see the humorous side of things when I am faced with problems					
Having to cope with stress can make me stronger					
I tend to bounce back after illness, injury, or other hardships.					
I believe I can achieve my goals, even if there are obstacles.					
Under pressure, I stay focused and think clearly.					
I am not easily discouraged by failure.					
I think of myself as a strong person when dealing with life's challenges and difficulties.					
I am able to handle unpleasant or painful feelings like sadness, fear or anger.					

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APPENDIX F
COGNITIVE AND AFFECTIVE MINDFULNESS SCALE-
REVISED (CAMS-R)

Please respond to each item by marking <u>one box per row</u>		Rarely/N ot at All	Sometimes	Often	Almost Always
CAM S-R1	It is easy for me to concentrate on what I am doing.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CAM S-R3	I can tolerate emotional pain.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CAM S-R4	I can accept things I cannot change.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CAM S-R5	I can usually describe how I feel at the moment in considerable detail.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CAM S-R6	I am easily distracted. I	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
CAM S-R8	It's easy for me to keep track of my thoughts and feelings.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CAM S-R9	I try to notice my thoughts without judging them.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CA M S- R1 0	I am able to accept the thoughts and feelings I have.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CA M S- R1 1	I am able to focus on the present moment.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
CA M S-	I am able to pay close attention to one thing for a long period of time.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

R1 2					
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Developed by: Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale- Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29(3), 177-190. Note that original scale was 12 items, but the original items 2 and 7 were deleted as less useful than the remaining 10.

APPENDIX G:

CONCLUSION STATEMENT

Thank you for participating in this study!

In case you need support for your mental health, below are available services:

Counseling Center: The center provides free online counseling services to all students.

You can contact 01-350 000 ext. 3196 or counselingcenter@aub.edu.lb

(<mailto:counselingcenter@aub.edu.lb>).

Department of Psychiatry AUBMC: To consult with a clinical psychologist or psychiatrist, you can get a referral from family medicine and then book an appointment through calling 01-350 000 ext. 5650 for students who have HIP coverage.

Embrace Lifeline: 1564: students who feel the need for immediate emotional support can call the lifeline which operates from 8:30 am to 5:30 am

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