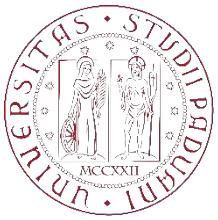


UNIVERSITY OF PADOVA

Department of Developmental Psychology and Socialisation*

Master Degree in Psicologia dello Sviluppo e dell'Educazione

Study track in Developmental and Educational Psychology

Final dissertation

Effects of a stress management training mobile application on international students' mental health and coping skills: a pilot study.

Supervisor

Professor Sara Scrimin

Candidate: Galine EL Khoury

Student ID number: 2071427

Academic Year 2023/2024

Abstract:

This research studies the effects of a digital stress management intervention (doing what matters most during the stress of time) on international students' coping mechanisms and psychological adjustment at the University of Padua. The subjects were one experimental group from diverse internationalities but all university students in Italy. The evaluation was carried out by filling out a survey of different scales. The first part was devoted to review the literature concerning the experiences of international students and stress levels and the various links between these concepts. The second part discussed the central problem of our research and will present the initial hypotheses. The third part focused on the methods. Participants' enrolment procedure will be described as pre- and post-intervention assessment measures, and most importantly: the intervention. Finally, this work closed with a fourth part devoted to the presentation of the quantitative results as well as qualitative and their discussion to arrive at a relevant synthesis responding to our initial problem.

Keywords:

Stress management – international university students – coping mechanism – psychological adjustment – digital intervention.

Table of contents:

Table of Tables

Table of Figures

Introduction

The pressure to select the right major and university is enormous in the development of young people, as the choice will alter their lives (Thomas, Orme, & Kerrigan, 2020). Of the 65,000 students admitted to the University of Padua, 5,200 are international students, and 1,700 are exchange students from various ethnic backgrounds. Migrating and moving can cause stress because of cultural differences, language obstacles, and the design of university curriculums (Machul et al., 2020). While some people may be resilient and able to adjust, others may be more open to unfavourable situations and more prone to undesirable consequences. Stress related to school can lower motivation, impede academic success, and raise the percentage of college dropouts (Pascoe et al., 2020).

Students must wait a month for their first psychological assessment at the University of Padua, since it only has one psychological assistance service for all students, with about ten therapists, but few are proficient in English or are qualified to work with foreigners. Also, there is no mention of activities or training in person or digitalized for international students. In 2021 the service began aiming at international students short-term, and long-term; students who identify themselves as needing psychological support (for short-term onset or enduring conditions), for specific difficulties adapting to new life conditions/environment, low self-esteem, poor emotion regulation skills or broader factors (feeling insecure, confused, difficulty making decisions, especially at the end of their courses) can refer themselves to the service. (SCUP., 2022)

In my thesis project, I studied the effects of a digital stress management intervention (that is, “Doing what matters most during the stress of time”, a training based on Self Help Plus, a group-based stress management course for adults. Generic field-trial version 1.0, 2021. Geneva: World Health Organization; 2021) (Barbui et al., 2022).

The first part will be devoted to reviewing the literature concerning the experiences of international students and stress levels and the various links between these concepts. The second part will discuss the central problem of our research and will present the initial hypotheses. The third part will focus on the methods. Participants’ enrolment procedure will be described as pre- and post-intervention assessment measures, and most importantly: the intervention. Finally, this work will be closed with a fourth part devoted to the presentation of the quantitative results as well as qualitative and their discussion to arrive at a relevant synthesis responding to our initial problem.

Chapter 1

International Students across the world

1.1. International students: Why Move?

After high school, some students decide to continue their studies abroad due to diverse factors such as 'pull factors' attraction motive for the individual to the country of destination (better educational opportunities, a beautiful city, or a partner living abroad) or 'push' factors that lead the individual to leave their country of origin (lack of a university that provides education in a specific field of study, conflict in the country). Each of these factors is divided into three categories concerned with academic dimensions of the stay (wish to become familiar with subjects that are not available at their home institution, gain academic experience in another country), some with cultural dimension (enhance their understanding of the host country) and a few with a personal aspect (improve career prospects, other friends were going). The opportunity for self-development (87% of respondents said it had a strong influence on their decision to study abroad) and learning a foreign language (also 87%) were the categories with the highest scores among all respondents (Maiworn, Teichler 2002).

Richmond (1994) claims that emigrants with the highest degree of freedom of choice are proactive instead of reactive. He argues that societal structures, norms, and values always influence individual choices, hence migrations are never completely voluntary. Some migration theories classify international students as proactive immigrants because their decisions are based on logical assessments and structural influences of gains and losses associated with material and symbolic benefits rather than being driven by external factors like fear or danger (war, natural disasters.)

According to UNESCO, international students are those who have moved across national or territorial borders to pursue an education and are now enrolled in a school outside of their home country; this definition excludes refugees, first or second-generation immigrants (UNESCO Institute for Statistics, 2006, p.178). The world has changed significantly because of globalization. Thus, students frequently decide to study abroad to acquire multicultural traits in addition to receiving a better education (Cruwys et al., 2015). Many parents believe that their children must receive an international education for them to be eligible for chances in multinational organizations. Due to their varied group membership when studying abroad,

international students differ from domestic students in that they have special qualities (Raja et al., 2021).

1.2. Data on international student's

Student mobility has received scant attention, and data investigating the effect of such processes is scarce. Yet, migration studies have received a great deal of attention through theoretical and empirical analysis (Brusa, Enkhtaivan, & Davaadorj., 2020; Cristaldi and Morri, 2015; De Vecchis, 2014; Meini, 2008). According to Staniscia (2012), international student mobility is a unique type of transient migration that has significant implications for both the origin and destination nations. The movement of university students is becoming a significant phenomenon in numerous countries. The number of people migrating to international universities has significantly increased. The migration patterns of foreign students reflect the unequal growth of the global education and economic system; flows from Asia, North Africa, and the Middle East to the USA, Australia, the United Kingdom, and the European Union have increased exponentially. The decision of students to study abroad is influenced by both push and pull factors, such as the scarcity of study options in their home country and their desire to live abroad, experience a different culture, and potentially work or study in a developed country in the future. For instance, obtaining a degree from a European Union institution may provide you with greater employment prospects in other European nations like Germany or France. The ability to improve the quality of human capital is provided by international student mobility, since "high profile" immigration may foster creative learning environments in universities and make the national system more competitive. From 2.1 million students in 1999/2000 to 5.7 million students in 2018/2019, international student mobility (ISM) has nearly tripled. This growth has coincided with the main global university rankings systems (e.g., Academic Rankings of World Universities, Times Higher Education, and Quacquarelli Symonds) (Hazelkorn 2012). Relative node size based on betweenness centrality measurements is visualized in Figure 1, emphasizing developing multipolarity in the expanding number of countries at the network's centre (Glass C., Cruz N. 2022). The figure shows how, in 1999/2000–2002/2003, a relatively small number of traditional destinations (the USA, UK, Canada, France, and Japan) and sending countries (China and India) exerted disproportionate influence in the network. In contrast, by 2015/2016–2018/2019, the influence of traditional destinations decreased as a growing number of planned hubs (Turkey and South Korea) and emerging hubs (Brazil, Portugal, Russia, Saudi Arabia, South Africa, and Ukraine) gained influence over time. The increasing similarity of the node size over time shows how more

nations started exchanging students at increasingly equal rates. However, it is noteworthy that a considerable percentage of all connections are still concentrated in a subset of connected nodes.

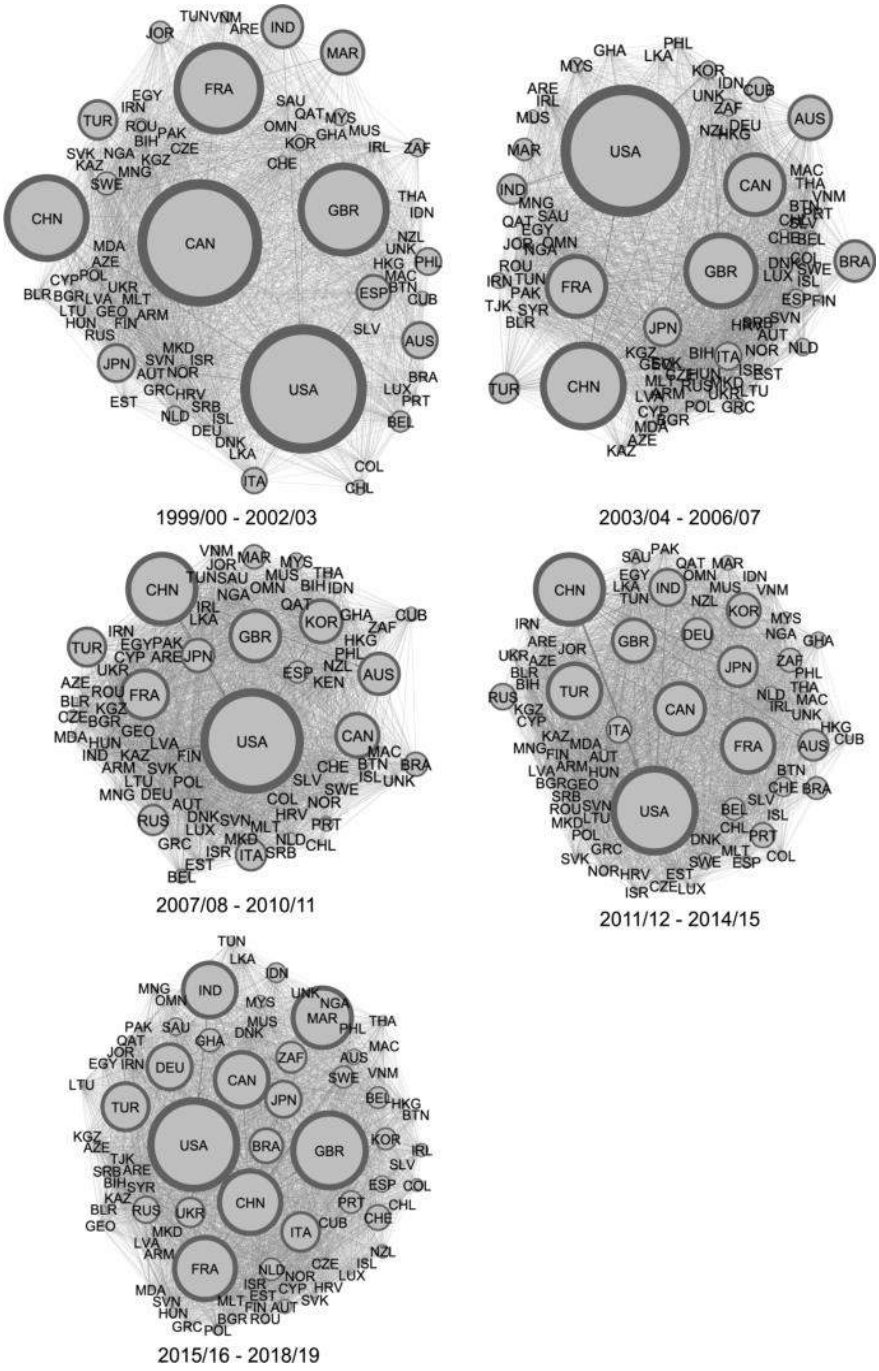


Figure 1: Yifan Hu, network visualization.

1.3. Percentages of international students in Italy and in Padova

According to the most recent data available for Italy, there were around 89,000 international students enrolled in 2018–2019, many of them were from Asia (26,313), outside the EU (20,453), and inside the EU (19,624) (Naldi, 2020). Annually, the percentage of foreign students pursuing education at Italian universities is rising. All percentages mentioned are based on MIUR data, from 2010 to 2020 an increase of 62% of foreign students in Italy. Cimea claims that the COVID-19 pandemic resulted in a 9% decrease in the number of foreign students enrolled in post-graduate and bachelor's degree programs. It's interesting to see that 47% of Italian institutions reported an increase in pre-registration applications despite the negative trend in the statistics on courses of study. Regarding master's degrees, 37% of institutions reported a minor decline in applications, whilst 63% of institutions saw an increase in applications (Lantero et al., 2002, pp. 5-6). Figure 2 confirms that the number of foreign students is increasing from 2018 to 2022 the number of international students increased from 80,000 to over 100,000 students.

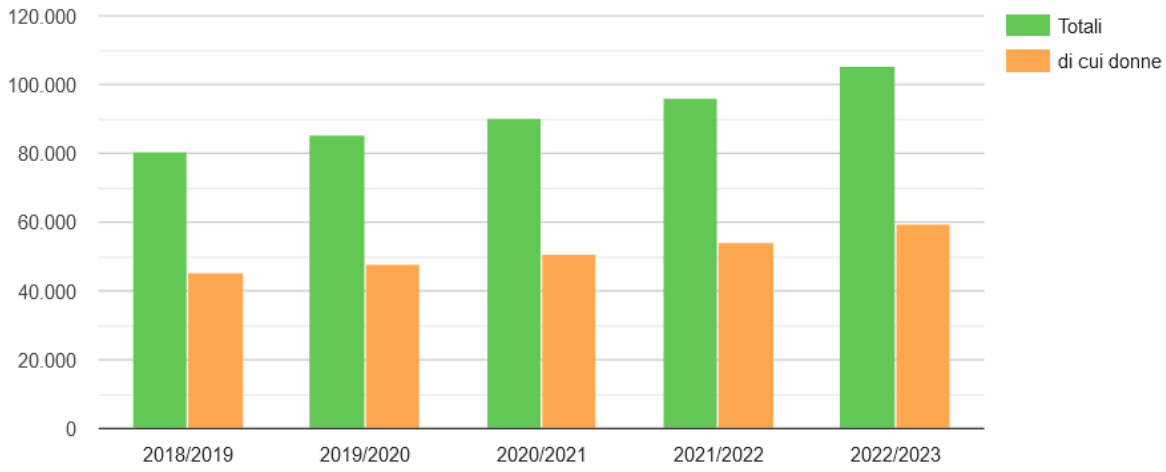


Figure 2: Historical series of foreign graduates in degree courses. Number of foreign students on the vertical axis and the academic year on the horizontal axis. MIUR data (2023).

Figure 3 displays the distribution of international students by the first ten citizenships for the academic year 2021–2022. These eight nations account for, on average, half of all international students; Iran, China, India, and Turkey are the most represented. Due to the influence of China, India, and Iran, Asia is the continent that is most represented in Italy among certain OECD nations. Most international students are from Asia. It appears that tracking

foreign students by place of origin is essential for creating customized advisory services and assessing how well the current collaboration rules are working (OECD, 2022). For example, Chinese students enrolled in Italian universities have increased due to the "Marco Polo" program, also we have the MAECI scholarship or even Borsa Regionale allowing students from third-world countries to pursue their studies in Italy.

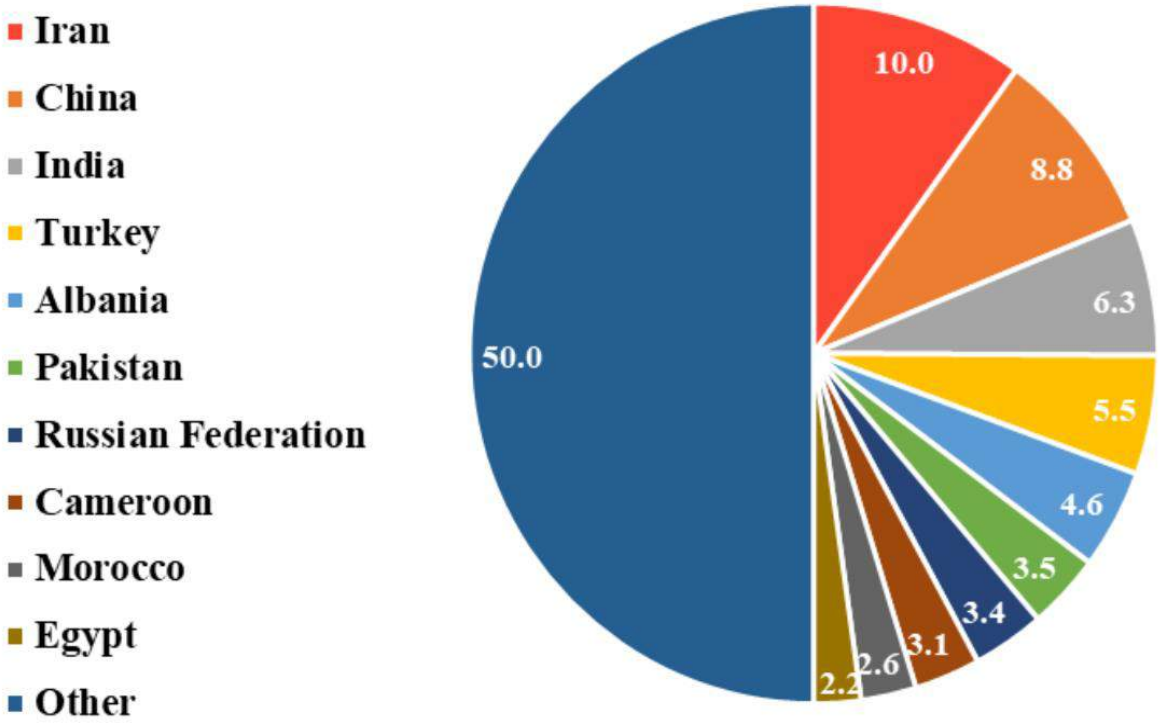


Figure 3: Percentage of international students enrolled by country of origin, academic year 2020/2021. Elaboration on MIUR data (2022)

According to the data provided by the Italian Ministry of University in 2023, At the University of Padua, 68712 students were registered of whom 12491 enrolled as first-year students. Regarding international students 6628 registered of whom 746 are first-year students.

The increase of international students at the University of Padua has multiplied by over three in the last 4 years. In 2018/2019, 2869 students registered. This significant increase can be due to the release of COVID-19 restrictions and an increase in country disasters (for example: the War in Ukraine, Turkey earthquake, Conflict in Iran). The number of women registered in 2022/2023 is equal to 3998 students which is considered more than half of foreign students in Padua, and 466 are first-year students. Unfortunately, no data was found on the race-ethnic division of those data and not to mention Erasmus students were not taken into consideration in this data collection.

Chapter 2

Stress, academic life, and migration.

2.1 Understanding stress

According to Taborsky et al. (2021), stress is the process by which an organism responds to stressors, including the identification of the stressor and launching the stress response. In 2018, Epel introduced a transdisciplinary model of stress that integrates insights from experimental and epidemiological methods (Figure 4). She describes stress as an interactive and emergent process. Stressors represented in the blue triangle are contextual, cumulative, and protective which are based on the person's own experience. Eventually, they add up and create habitual processes that determine the allostatic states and how the intensity of the situation is perceived, therefore, influencing our daily stressors and our acute stress (caused by a recent event). Allostatic load is described as the disturbance of numerous physiological systems into consistently high, low, or non-adaptive states even when stressors are removed, resulting in wear and tear on the body. Health behaviours have a direct impact on allostatic states and load, and they also interact with stress exposure and reactions. In the case of dysregulation, an allostatic load appears leading to early biological aging and disease due to chronic stress impacting the HPA axis' dysregulation and hyperactivation (Sapolsky, 2002). The hypothalamic-pituitary-adrenal axis (HPA) is an essential factor in stress response by controlling the release of cortisol (Oosterholt, 2015).

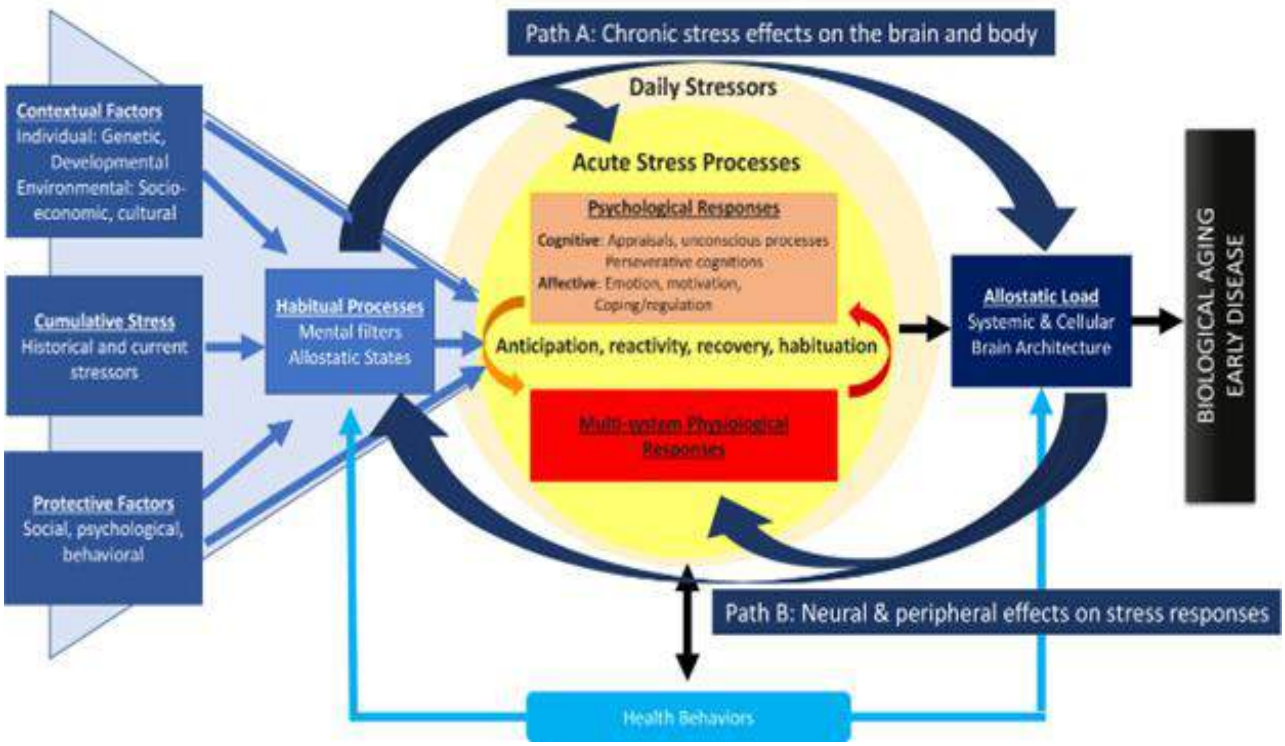


Figure 4: Transdisciplinary model of stress: Integrating contextual, historical, habitual, and acute stress processes (Epel, 2018)

Historically, the term stress was introduced in biology (Cannon,1935; Selye 1956). While Selye's work laid the foundation for stress research, Lazarus and Folkman's definition of stress emphasized the dynamic interplay between perceived demands and available resources, highlighting the role of psychological processes in mediating stress responses, contrasting with Selye's focus on biological mechanisms. Taylor and colleagues created the "tend and befriend" theory to investigate female stress response from an evolutionary and biosocial standpoint which caused a better understanding of the overall human stress (Taylor et al., 2000). Because of the cyclical hormonal fluctuations of the female reproductive system, this makes measuring the hormone responses to stress in females more difficult (Ganz, 2012). Cortisol and testosterone levels, as well as behavioural reactions, differ between males and females in response to stress (Byrd-Craven et al., 2016; Kivlighan et al., 2005; Levy et al., 2019; Taylor et al., 2010). The goal is not to refute the flight-or-flight theory of stress response (Eisler & Levine, 2002), but rather to demonstrate that stress responding can take on many forms and still serve the same purposes for reproduction and survival. Females are less likely to participate in fight-or-flight behaviour patterns during a stressor and more likely to give care and seek out affiliative support from others (Byrd-Craven et al., 2016; Taylor, 2006). Compared to the fight-or-flight response, a stress response pattern that is more consistent with caring and befriending

has been shown to produce superior health results. It has been demonstrated that fight-or-flight responses have long-lasting detrimental effects on health because they repeatedly and chronically activate the HPA axis and associated neuroendocrine and immune systems. This results in a decrease in immunological and cardiovascular function (e.g., allostatic load) and increased wear and tear on these systems. Males have higher levels of violence, substance abuse, and coronary artery disease, among other fight-or-flight response behaviours (McEwen, 1998; Taylor, 2012). Conversely, caregiving and befriending activities have been linked to improved long-term health and well-being (Taylor, 2012), mostly because of heightened social support.

Robert Sapolsky talks about social stress by focusing on HPA axis activity, which is impacted by hierarchy and social support (Sapolsky, 2005); dominant individuals exhibit higher levels of physiological stress when they have to aggressively and repeatedly demonstrate their dominance, as is the case, with cooperative breeders and in species experiencing fleeting periods of rank instability (Abbott et al., 2003; Sapolsky, 2005; Creel, 2022). Three different processes have been identified (Brosschot et al. 2020; Garfinkel et al. 2016) to be responsible for an unfavourable, persistent stress response. First, perseverative cognition, which is the relentless reflection on unfavourable past or prospective experiences. Increased cardiovascular and endocrine system activity is a result of this persevering cognition. Second, unconscious stress, where most of the brain activity occurs in humans without conscious awareness, allowing the body to respond to stress physiologically without conscious knowledge. Third, stress as a default reaction when safety is not perceived. This stress response is always "on" and doesn't require any stressor. When circumstances and the environment are deemed "safe," it goes off; if that perception decreases it comes back on. According to Brosschot (2017), the stress response is "disinhibited," or always on, in the absence of perceived safety. Stressors do not "turn on" the stress response; rather, it is the default. People who lived and passed on their genes were those whose stress reactions remained active, giving modern people a lifelong defence mechanism against risks to their survival. According to him, a healthcare provider's job is to encourage patients to participate in activities that generally foster a sense of safety and so prevent the body's natural stress response.

Currently, according to the World Health Organization (WHO, 2023), everyone experiences stress, and it is a natural human response; however, how we respond makes the difference. The American Psychological Association adds to this definition that tension influences every organ in the body and can be manifested by sweating, dry mouth, fidgeting and many more, causing

those changes that can lead to disorders that alter the quality of life and our functioning. When it comes to how people react to stress, the autonomic nervous system is crucial (Fries, 2005). The sympathetic nervous system is triggered by introducing a stressor during typical stress reactions; the system reverts to its initial state as the stress subsides (Dmitrieva, 2013). What someone can perceive as stressful might not be the same for someone else, so only the person can judge the severity of the situation; for example, a student might be over-stressed and not able to think clearly because he must take an exam while another might be confident and calm about taking the same exam. Just being stressed can increase pressure and lead to chronic uncertainty. The relative balance between perceived demands and perceived resources—two different appraisal forms—determines stress. The person may feel relatively free if there are more resources available than there are demands. A person should be functioning at their highest level of efficiency if they are "in balance", suffering results from perceived demands that are greater than apparent resources. The mechanism that can offer some control over the equilibrium is called "coping".

2.2 Stress response: acute and chronic outcomes.

Our ancestors evolved an instinctive reaction to protect themselves from predators and other dangers. When the body senses danger, stress chemicals like adrenaline and cortisol are released, raising blood pressure, heart rate, and energy levels while preparing the body to handle the situation. Stress impacts so many vital areas of life, it is a serious health concern (Cohen & Williamson, 1991; Dyson & Renk, 2006; Neff & Karney, 2004; Sauter & Murphy, 1995). Stress, for instance, has been linked to mental health issues such as anxiety disorders (Connor et al., 2007) and depression (Cole et al., 2006; R. T. Liu, 2013). Additionally, there is growing agreement that stress is closely linked to ill physical health and the chance of developing a disease (Cohen et al., 2007; Epel et al., 2018). Additionally, studies have shown how stress contributes to aging processes, such as dementia formation and cognitive decline (Greenberg et al., 2014; Tschanz et al., 2013). Regarding acute stress, according to the DSM-5-TR, post-traumatic stress response disorder can only be diagnosed at least one month after a trauma, whereas acute stress disorder (ASD) can only be identified during the first month following a trauma. ASD and PTSD can coexist, or PTSD may appear months or even years after the trauma without any clear predisposition issues (Goldstein et al, 2016). The symptoms of stress disorders are manifested differently in children (Josephine E. 2023). Acute stress caused by a current event can cause sweaty hands, and stomach-ache which is a normal reaction, and a small amount of stress is good since it releases adrenaline and therefore

enhances performance and maturing as a person (Linley & Joseph, 2004). The relationship of a person's biological and historical contexts with acute stress responses is critical for understanding how stressor exposures affect long-term health (Boyce, 2016). The prefrontal cortex might be sensitive to acute stress since we rely more on habits when deciding rather than mental flexibility (Broadbent, 1971). However, strong evidence indicates that acute stress modifies various types of cognitive functioning, depending on the situation, the brain circuitry these tasks recruit, and the intensity of the stressor (Shors et al, 1992; Stillman et al, 1998; Cordero et al, 2003; Joëls et al, 2006; Shansky et al, 2006; Luethi et al, 2008). On the other hand, it was revealed that when someone experiences acute cold stress or when subjects are administered exogenous glucocorticoids decision-making is impaired by decreasing the gain or choosing the riskier option when the percentage of failing is higher (Miu et al, 2008; Porcelli and Delgado, 2009; Putman et al, 2010). Stress-related disorders not only place a heavy personal burden on those who suffer from them and their social networks, but they also have enormous economic costs associated with them that are estimated to be even greater than those associated with somatic disorders. These costs include lost productivity and income, medical expenses, and other costs. (Trautmann et al., 2016).

If stress alters the daily life of a person and affects his abilities, we can start questioning if he is experiencing chronic stress, which is a prolonged external or internal stressor even when it's physically absent its effect is persistent. Its memories have the power to replace its absence and maintain long-term tension, causing severe problems like anxiety, insomnia, muscle pain, high blood pressure, and a weakened immune system and leading to illnesses like depression, obesity, heart diseases, irritability, fatigue and impairment of cognitive functions (APA, 2018). When tension becomes repeated constantly it can lead to inflammation in the circulatory system which can cause a heart attack (William Shaw et al. 2023). Chronic stress and depression have a deleterious effect on the hippocampus, a crucial brain region involved in memory (McEwen, 2001). Emotional memories are stored in the hippocampus in part because of the hormone cortisol, which is in the stress response (Lupien et al., 1998). Chronic stress can be neurotoxic, causing cortisol to shrink the hippocampus and cause memory problems (Severstrom, Geiger, Boggero, Schmitt, & Sephton, 2016; Lupien et al., 1998; Seeman, McEwen, Singer, Albert, & Rowe, 1997). Higher levels of cortisol are associated with lower levels of hippocampus volume and memory function in older adults. According to Robert Sapolsky (2004), depression and chronic stress are the same thing—those who have been depressed for a long time are just people who have been battered and overwhelmed by life's challenges. The sympathetic nervous

system and the hypothalamic-pituitary-adrenal axis are the two bodily arms of the stress response that are triggered by the amygdala's responsiveness to perceived stress and negative emotion (Lehrer, Woolfolk, & Sime, 2007). As part of the fight-or-flight reaction, the sympathetic nervous system releases the catecholamines adrenaline and norepinephrine, also known as adrenaline and noradrenaline. This results in elevated blood pressure and heart rate. To respond to the stressor, the hypothalamic-pituitary-adrenal axis, which releases cortisol, activates energy reserves. Long-term stress raises cortisol and adrenaline levels, and cortisol levels just after a traumatic event indicate a higher chance of developing post-traumatic stress disorder later (Delahanty, Nugent, Christopher, & Walsh, 2005; Delahanty, Raimonde, Spoonster, & Cullado, 2003). Depression and anxiety are often associated with dysfunction of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system (Sapolsky, 2004).

Lastly, research has demonstrated that social support can lessen psychological suffering, including sadness and anxiety (Fleming et al., 1982; Sarason et al., 1997). Making friends can also help lessen loneliness, which is linked to worsening mental and physical health when it is high (Hawkley & Cacioppo, 2010). Long-term physical and mental health for those who struggle with stress is likely to be supported by interventions that encourage tending and befriending behaviors, such as those that encourage using social assistance and lessen impulses to separate from others amid stressful life circumstances. As per Hutcherson et al. (2008), mindfulness interventions have the potential to be a useful instrument in promoting befriending, or social connection.

2.3 Stress response and coping

To better understand the coping responses, we need to better comprehend the difference between perceived stress and affective stress because they are one of the factors that influence the chosen strategy. Perceived stress is defined by Lazarus as a response to a specific condition, often consisting of multiple psychological components of the stress reaction, such as emotions of overload or worry, as well as thoughts that demand outweigh resources or that control is lost. Despite the importance of emotional affect in the conceptualization and assessment of perceived stress, they are not the same thing. Affective stress is a broad word that encompasses all emotional experiences, including emotional reactivity, long-term mood states, and dispositional characteristics (DeSteno et al., 2013).

In 1985, Folkman and Lazarus defined coping as the "mental and behavioral attempts an individual makes to control (manage, lessen, or put up with) a problematic person-environment interaction." Lazarus has made a distinction between emotion-focused coping (more concerned with controlling upsetting emotions and minimizing problems) and problem-focused coping (helps in adapting to external demands) and there is avoidance-focused coping (Strentz & Auerbach, 1988). The main models of coping consider it a transactional process involving multiple evaluations and a continuous interaction between individual and environmental factors (Lazarus and Folkman, 1985). However, some theories categorize coping as a binary term, such as "approach or avoidance" coping and "problem/cognitive-focused or emotion-focused" coping (Berry, 1997; Guardino & Dunkel Schetter, 2014).

Several studies have demonstrated that avoidance-focused coping is positively connected to concurrent acute and chronic stress (Bartone, 1989; Bryant & Harvey, 1995; Johnsen, Laberg & Eid, 1998; Miculincer, Florian & Weller, 1993). For example, emotional suppression is a maladaptive emotional avoidant coping technique that aims to prevent feelings from being experienced or acknowledged. Restraining oneself from expressing one's emotions can drain mental energy and eventually result in anxiety and avoidant behavior, as well as distress and low self-esteem (Aldao et al.,2010; Cutuli, 2014).

Moving to cognitive processes that determine the intensity and kind of emotional response are known as cognitive appraisals. The person's environment can either reward or penalize the emotional response, leading to an ongoing interaction between the individual and their surroundings. According to Lazarus, personality traits and environmental cues interchange during the cognitive process (Lazarus & Monat, 1974). Cognitive reappraisal, which is a problem-focused coping, is the ability to modify someone's perspective regarding a specific context by highlighting the good in it can help reassess stressful situations and therefore decrease their intensity (Gross & John,2003; Eisma & Stroebe,2021). Problem-solving or instrumental self-management are often viewed as adaptive or protective methods and have been connected to successful coping in high-performance/high-stress settings (Larson & Hayward, 1990; Larsson, Kempe & Starrin, 1988). However, other research has proved that stress lessens one's ability to employ cognitive reappraisal; therefore, even those who have received training in this technique may find it difficult to use it successfully in stressful situations (Raio et al., 2013).

Emotions, as described by Lazarus, have three main components: subjective affect, physiological changes, and actions. From a cognitive perspective, assessments play a significant role in the stress procedure by influencing how individuals perceive and respond to challenging circumstances. Secondary assessments assess reaction possibilities and select coping mechanisms, whereas primary appraisals deal with the instant judgment of characterizing a situation as good or poor (Lazarus, 1991). This differentiation is helpful because various stressors place varying demands on coping resources, and some coping strategies are more commonly utilized in situations (Rosenthal and Rosenthal, 1985; Auerbach, 1989; Fontana, 1990). When preparing for an exam, a person will typically utilize problem-solving and coping strategies (such as revision, study, and memorization) if the test is far off. Still, they will quickly switch to emotion-focused coping in the final moments before the test. Emotion-focused coping happens early if the event causes very strong feelings (such as fleeing a gunshot). Research using crisis support has linked emotion-focused coping to reduced levels of post-traumatic stress reactions (Joseph, Williams & Yule, 1992). Additionally, research using a military sample has shown that emotion-focused coping is a durable coping approach (Eid, 2000).

In Figure 4, shown above, Elissa Epel mentioned contextual factors such as environmental and individual, that mold the person's resilience and the percentage of danger caused by the stressor (Folkman et al., 1986). Other factors that contribute to cognitive and emotional appraisal are cumulative stress (history and current stressors) and protective factors (social and psychological support). In the habitual process, it is the lens from which the problem is seen based on cognitive biases and allostatic states, modern theories of emotional and stress response development see the brain as a 'prediction machine' in which evaluations of events are influenced by one's personal memory bank of what to expect as well as present inputs (Barrett and Simmons, 2015; Epel 2018). For example, early childhood adversity is associated with changes in social, cognitive, and behavioural processes in daily life, such as increased threat appraisal, difficulty regulating emotions, and ineffective social behaviours (Repetti et al., 2002), Persistent pressure alters the brain structure to be prepared for future stress by affecting the psychological and physiological responses (Brosschot et al. 2020). The experience of life stressors may influence the selection and involvement of bad health behaviours (Umberson et al., 2008; Mezuk et al., 2013), In the short term, these actions reduce the psychological experience of stress and physiological stress responses, while in the long run, they may impair physiological functioning (Epel, 2018). For example, consuming high-sugar

beverages (Tryon et al., 2015), smoking (Wardle et al., 2011), and alcohol consumption (Stephens and Wand, 2012) can temporarily reduce the physiological stress response, but they are harmful to health if continued over time. Importantly, there are stress appraisals that have a positive impact on health or ability to tolerate the stressor, such as viewing a stressor as advantageous (benefit finding) or meaningful (Moskowitz et al., 2007), and we are exposed to different kinds of stress that influence our responses. The next sections will mainly focus on acculturation and academic stress since most international students are sensitive to them. In addition, different approaches to treating stress will be discussed in the following chapter primarily focusing on psychological adjustment interventions.

2.4 Acculturation stress and coping

Due to factors including globalization, increased geographic mobility, conflicts, and humanitarian crises, many civilizations today can be classified as varied. The provincial, homogenized worlds that defined much of human history are no longer the norm for people to live in. Instead, increasingly complex representations of identity have replaced conventional social, cultural, and physical boundaries. Analysing how people psychologically adjust to these new social realities is necessary to comprehend the influence of variety in modern society. The analysis provided by acculturation research is one example. One of the main components of acculturation is cultural diversity. According to Berry (1997), migrant workers may face higher levels of acculturative stress concerning increased cultural differences. For instance, migrant groups from China and Vietnam experienced higher levels of acculturative stress compared to migrant groups from Latin America, who were more like one another culturally (Lommel & Chen, 2016).

The psychological process of immigrants adjusting to a new social reality, known as acculturation, entails managing any conflicts that may arise between their former cultural identity and their new identity as citizens of the host country. According to one definition, this process is "the process of cultural and psychological change that results following a meeting between cultures. According to Berry (1980, 1997), acculturation techniques are crucial in determining how people react to cultural variety. Among these tactics is assimilation exclusive identification with the host or dominant culture. Distancing oneself from the prevailing culture and identifying only with the native one is known as separation. Marginalization is the phenomenon of not identifying with another culture or rejecting the other. Integration is the process of fusing the two cultures to create a bicultural or multicultural identity. Acculturative

stress is the term used to describe the negative reactions that result from experiencing social and cultural variety (Berry & Annis, 1974). The tension between the original and host cultures causes acculturative stress, which shows itself as uncertainty, worry, despair, and a general decline in well-being and self-esteem (Sam & Berry, 2010). Acculturative stress, for instance, has been linked to worsening smoking and riskier sexual activity (Du & Li, 2015; Gotay et al., 2015); it has also been linked to a higher risk of suicide conduct (Rousseau & Frounfelker, 2019).

Furthermore, compared to natives of the host nation, migrants are more likely to experience depression (Farah & Choi, 2019; Khaled & Gray, 2019). It's also been acknowledged that a lot of migrants have ups and downs because of their inflated pre-arrival impressions of their new country (Pettit & Ruijtenberg, 2019). A coping strategy may work well in one situation but not always in another, there is no one perfect coping mechanism (Tiwari et al., 2017; Vergara & Noom, 2014). Cultural factors, as well as social capital and resources, influence how different migrant coping strategies are during the acculturation process (Berry, 1997; Kuo, 2014). For instance, South Asian migrant workers in Qatar primarily use family contact in their home country as a coping mechanism for depression and acculturative stress (Khaled & Gray, 2019). One study on African, East Asian, and Southeast Asian migrants in Canada discovered that many turned to religion and spirituality as a coping mechanism (Chaze et al., 2015).

Acculturation and acculturative stress among voluntary migrants, like international students and expats, differ significantly from other types of migrants, due to their unique living circumstances and obstacles (Tiwari et al., 2017; Vergara & Noom, 2014). For instance, migrant workers may experience less severe acculturative stress than forced migrants, or refugees, who typically endure pre-migration traumas like torture and the death of family members in their native country (Alemi et al., 2014; Berry et al., 1987; Chen et al., 2017; Gill et al., 2011).

2.5. Academic stress and coping

The change from a high school to a university can led to stress especially when the individual is still experiencing growth and hormonal imbalance. Three out of every four college students self-reported feeling stressed, and one out of every five reported having suicidal thoughts as a result of stress, according to a 2015 American College Health Association-National College Health Assessment survey (Liu, et al., 2019; American Psychological Association, 2020). During this time, mental health conditions can manifest, such as anxiety, depression, and

substance addiction disorders (Pedrelli et al., 2015; Saleh et al., 2017; Liu, et al., 2019). In fact, 87% of university students reported having stress due to academic pressure (American Psychological Association, 2020). The new educational challenges pressure students that can include a heavy course load, intense study sessions, managing time effectively, competitive classroom settings, financial worries, family obligations, and adjusting to a new environment (Liu et al., 2019; Karyotaki et al., 2020). Stress-related to school can lower motivation, impede academic success, and raise the percentage of college dropouts (Pascoe et al., 2020).

Research has demonstrated that students' mental health is adversely affected by academic stress (Green et al., 2021). Happiness, life satisfaction, stress management, and psychological functioning are all aspects of mental, or psychological, well-being, which is a component of positive mental health (Defeyter et al., 2021; Green et al., 2021). Academic stress can vary from one student to another; Compared to their male counterparts, female college students report higher levels of stress (Evans et al., 2018; Lee et al., 2021). Furthermore, non-binary students report more stressors and mental health problems than their cisgender peers (Budge et al., 2020). Academic stress levels in college students have also been demonstrated to be influenced by their academic year (Defeyter et al., 2021). While several studies (Lipson et al., 2018; Liu, et al., 2019; Kodish et al., 2022) suggest that students from racial/ethnic minority groups are more likely than their advantaged peers to experience anxiety, depression, and suicidality, these studies are few and frequently provide conflicting or equivocal results (Liu, et al., 2019; Kodish et al., 2022); further studies are needed in this field.

The significance of the various coping mechanisms employed by university students has also been acknowledged by earlier studies on the emotive and motivational aspects of learning in academic settings. A few instances have discussed the function of health routines as a coping mechanism (Tada, 2017) and the role of religion in coping (Francis et al., 2018). There was evidence that younger persons tended to use more passive coping strategies than older adults (Blanchards, 2007). Researchers Mahmood et al. (2012) discovered that a younger adult population had higher levels of anxiety when they often used passive coping strategies such as substance abuse, avoidance, and self-blame. A university's class standing, age, and gender may also be related to problems with passive coping. Active emotional regulation skills characterize a person's ability to identify and notice their own thoughts and feelings. It has been demonstrated that this kind of person mostly uses behavioural and intellectual action responses to move toward personal goals in the face of stressful emotional situations (Gratz, 2004). Significant ramifications to assist college students with acclimating to their coursework,

particularly in the early stages of their studies, with an emphasis on resilience and how active emotions can have either a beneficial or negative impact (Finkelstein-Fox L, 2018).

2.6. Acculturation and academic stress in international students.

International students are particularly susceptible to the detrimental effects of acculturation issues because they are transient residents who have not developed a lasting social support system in the host culture (Berry et al., 1987). Even while there is a definite need to give acculturation stress more attention, many university services for international students focus their programs more on academic advancement and immigration laws which demonstrates how little social and emotional help is offered.

Living overseas and becoming a foreigner are inherently challenging for people of all ages, particularly during delicate times when psychological strain could be higher due to a lack of life experience (Hunt & Eisenberg, 2010). Language obstacles, cultural differences, and the design of university curricula can all make it difficult for international students to adjust to a new nation (Machul et al., 2020).

Numerous research (Skromanis et al., 2018, Yang et al., 2018) have examined the lifestyle and health practices of international students from a variety of cultures and places of origin, other than acculturative stress being common for international students and immigrants a big initial stressor can be visa status and bureaucracy. Poor performance may be the cause of failure for a foreign student, and anxiety over losing their visa status is likely to add to their stress levels. Therefore, there's a chance that foreign students will be caught up in a downward spiral that could lead to failure and perhaps an unwanted departure from this nation. Energy is depleted by concern and constant watchfulness over threats to one's status which leads to stress reactions. Furthermore, because they do not speak the native language, overseas students typically have fewer options for side jobs (Rienties et al., 2011).

In addition, the Transitional phases of late adolescence and early adulthood are characterized by significant physiological and psychological changes, including increased stress (Matud et al., 2020) adding to that separation from accustomed interpersonal relationships with families, friends, and communities is another factor. Social networks are a valuable tool for coping with stressful circumstances, particularly ones comprised of "strong ties" (Bozionelos, 2006). When international students relocate to their new nation, they will be split away from their familiar support systems. They are more prone to feel stressed because they will probably have fewer

extensive social networks in their new place, and emotions intensify the more the student is isolated (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Richardson, Abraham, & Bond, 2012). Scientific works aimed at elaborating individual coping mechanisms and strategies for acculturation stress have emerged with the rise in studies devoting themselves to the nature of acculturation stress, particularly in young migrants and students (Pheko et al. 2014). According to a study done by Maqsood et al.(2017), there is no difference in educational stress between genders, age, and BMI but it was the place of residence, profession, and level of education so stressors are demanding schedule, a lot of studying, time management, competitive classrooms, financial worries, pressure from family, and adjusting to a new setting (Liu et al., 2019; Freire et al., 2020; Karyotaki et al., 2020). Even if both genders have the same levels of stressors, it is important to mention based on the Tend and befriends theory that their response varies (Misra et al., 2000; Verma et al., 2011).

People's views of what constitutes stress and how they react to it vary greatly (Fink, 2016). Positive effects from stress could include improved learning and performance as well as personal development (Everly et al., 2002; Lazarus & Folkman, 1984). Psychological stress, however, results from a subjective assessment of the situation as demanding one's capacity for adjustment (Cohen et al., 2007). Studies conducted in English-speaking nations have reported no differences in emotional problems, academic difficulties, or financial concerns between domestic and international students (Clough et al., 2019; Fritz et al., 2008; Khawaja & Dempsey, 2008). However, it should be noted that the national origin of international students varies among English-speaking nations (OECD, 2021). More research is required considering the current evidence, which is primarily from overseas students studying in English-speaking nations. The linguistic divide between the nations is crucial since it may have a big impact on international students' experiences in English-speaking versus non-English-speaking nations.

In Italy, the level of inclusion of international students not only dictates the quality of their education but also the pertinent role that universities play in the global educational system. The first step in this process should be to fasten the process of acclimating international students to daily life. Although more students mean more benefits for university education, there is a chance that non-Italian students will experience a range of social and mental health issues, including anxiety, sadness, and other issues. In 2020, Cipoletta S. et al. assessed the perceived social support and well-being of foreign students at the University of Padua and revealed that international students were more vulnerable to psychological support compared to Italian students, especially students who come from collectivist cultures. Comparing short-term

students to long-term students, the former showed less distress, more social support, and an improved capacity to spread dependency. The findings also supported the connections between dependency dispersion, network breadth, social support, distress, and well-being. Higher perceived social support and dispersion of dependency were linked to greater well-being and decreased distress, Therefore international students in Padua were categorized as 1) Students who lacked resources, had concentrated dependency, lacked social support, lower well-being, and had higher levels of distress; 2) Short-term learners, who have more resources, differentiated dependency, higher levels of well-being, and lower levels of distress; 3) students who require assistance but who are not differentiated, displaying a greater degree of anguish and a poorer level of well-being.

International students' use of problem-focused coping mechanisms and acculturative stress were found to be positively correlated in multiple research (Akthar &Herwig, 2015; Kosic, 2004; Mohammady et al., 2012; Noh, Beiser, Kasper, Hou, & Runmens, 1999). Furthermore, a few studies (An Ra & Trusty, 2015; English et al., 2015; Mohammady et al., 2012; Sheikh et al., 2004; Taylor et al., 2004; Wei et al., 2008) found a positive correlation between emotional oriented coping methods and acculturative stress. Moreover, Crockett et al. (2007) found a favourable correlation between active coping and acculturative stress. Furthermore, the results of a few research that were analysed suggested that social support has a major mitigating influence on the relationship between coping mechanisms and acculturative stress. (Ickes et al., 2015; Yeh & Inose 2003; Thomas & Choi, 2006; Lee, Koeske, & Sales, 2004). The next chapter will discuss different psychological adjustment and coping strategies interventions specifically for international students.

Chapter 3

Intervention programs for stress management in universities

3.1 Introduction of different possible interventions

The first weeks of a new academic life are crucial for students and the university plays a very significant role in that by welcoming, facilitating, and informing the new students upon arrival (Lemma, Gelaye, Berhane, Worku, & Williams, 2012; Richardson et al., 2012). As previously discussed, there are many different contributing variables to the multifaceted stress that college students endure (Reddy et al., 2018; Karyotaki et al., 2020). Students' assessments of their mental health have been decreasing over the last 25 years; between 2009 and 2010, this decline was 13% (Pryor, Hurtado, DeAngelo, Blake, & Tran, 2010). Additionally, research indicates that compared to earlier generations, today's students have considerably greater difficulties managing their stress (Bland, Melton, Welle, & Bigham, 2012).

Therefore, it is up to the universities to provide enough resources to help them out. Because a robust correlation exists between students' well-being and university satisfaction, universities need to go in that direction and establish trusting bonds with the students (Misirlis, 2020). Increased demand for college mental health services is partially explained by increases in psychosocial differences and mental health severity in the college population, according to a study conducted among college administrators (Watkins et al., 2012). The patterns hold across various nations and environments. For instance, a study conducted on medical students in Saudi Arabia found that 63% of them reported experiencing stress, while 25% reported severe stress (Abdulghani, AlKanhal, Mahmoud, Ponnamperuma, & Alfaris, 2011). Academic stress has been linked to high suicide rates among Asian Americans and Asian nationals (Leong, Leach, Yeh, & Chou, 2007). Several studies conducted in France have also found high rates of student distress (Saleh, Camart, & Romo, 2017). Another issue is that many students are reluctant to ask for assistance. According to Ennis et al. (2019), students exhibit low levels of help-seeking even in situations where accessible resources are available. This phenomenon contributes to the fact that only 25% of students who are diagnosed with a disorder receive treatment (Eisenberg, Golberstein, & Gollust, 2007). The fact that drop-out rates from psychological interventions can reach 67% (Hall, Brown, & Humphries, 2018), which is significantly higher than levels seen in other mental health settings (Swift & Greenberg, 2012; Xiao et al., 2017),

is another cause for concern, even though psychological interventions are a major focus of university treatment services (Mowbray et al., 2006).

A meta-analytic evaluation for stress reduction in college students, conducted by Yusufov et al., (2019); assessed 43 studies from the year 1980 to 2015 focusing on 6 interventions: Cognitive–behavioral therapy, coping skills, social support interventions, relaxation training, mindfulness-based stress reduction, and psychoeducation. Diverse interventions were created across the years, some focused on one specific technique while others combined and modified them. A specific context's anticipated effectiveness is taken into consideration when choosing which approaches to include in stress reduction therapies, it is essential to have a better grasp of all the diverse approaches. For example, increasing understanding of stress's causes as well as its emotional, cognitive, behavioral, and physiological impacts is the aim of psychoeducation (Steinhardt & Dolbier, 2008). The goal of relaxation training is to modify or lessen the physiological stress response. It encompasses methods like progressive muscle relaxation, guided imagery, biofeedback, and meditation (Henriques, Keffer, Abrahamson, & Horst, 2011; Ratanasiripong, & Kathalae, 2012; Zargarzadeh & Shirazi, 2014). The goal of cognitive-behavioral techniques is to recognize and alter maladaptive thought patterns and behaviors, such as alcohol consumption and catastrophizing (Orbach, Lindsay, & Grey, 2007). Social support-based interventions provide spaces where people feel comfortable sharing their ideas, feelings, and experiences (Ando, 2011; Kim, Lee, Kim, Noh, & Lee, 2016). The goal of coping skills training is to modify coping mechanisms to address certain stressors (Jones, 2004; Sheehy & Horan, 2004). Ultimately, the theory behind mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) is that self-focused thoughts and emotions that contribute to poor mental health can be lessened by developing one's capacity to attend to present-moment experiences in a receptive manner (Call, Miron, & Orcutt, 2014; Chen, Yang, Wang, & Zhang, 2013; Phang, Mukhtar, Ibrahim, Keng, & Sidik, 2015; Warnecke, Quinn, Ogden, Towle, & Nelson, 2011). Depending on the kind of intervention strategy utilized and the length of it, they compared changes in anxiety or perceived stress from before to after training.

The results of the meta-analysis indicated that most interventions are successful in lowering both stress and anxiety in students. While relaxation training, mindfulness-based stress reduction, and psychoeducation were more effective in lowering emotional response (anxiety), cognitive-behavioral therapy, coping skills, and social support interventions were more effective in reducing perceived stress. While both long- and short-term therapies significantly reduced participants' anxiety and perceived stress in comparison to control groups, long-term

interventions were more successful in lowering participants' anxiety when it came to relaxation training. Even though all six strategies were successful in lowering at least one stress-related outcome, the small variations in efficacy imply that it is worthwhile to customize interventions for the specific group and goal in mind. Another meta-analysis of 24 controlled studies, conducted in 2013 by Regehr et al., showed that cognitive, behavioral, and mindfulness-based interventions focused on stress reduction significantly reduce symptoms of anxiety even with students in different programs and different countries, these results are remarkably consistent. Furthermore, the intervention has an impact not only on individual appraisal of stress symptoms but also on biological arousal by reducing cortisol levels.

Few interventions modified their content to fit certain student experiences (Coughlin & Kalodner, 2006; Franko et al., 2005; Geisner et al., 2015; Hamdan-Mansour, 2009; McIndoo et al., 2016; Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016; Taylor et al., 2016). The majority of these showed the greatest efficacy when they provided more sessions and based their adaptations on empirical data (Hamdan-Mansour, 2009; Taylor et al., 2016). Some modified the mode of delivery, opting for a shorter or web-based approach, but among those who did shorten their course of treatment, there was no indication of any improvement (Bentley et al., 2018; Cook et al., 2019; Fitzpatrick, Darcy, & Vierhile, 2017; Franko et al., 2005; Levin, Haeger, Pierce, & Twohig, 2017). There are few PTSD interventions available, and no research that addressed self-harm or suicide ideation satisfied the requirements (Barnett, 2021). Data on therapies that effectively address suicide ideation in young people are scarce (Robinson, Hetrick, & Martin, 2011). This is concerning because there is a growing prevalence of PTSD, suicide thoughts, and self-harm among student populations (Heath, Toste, Nedecheva, & Charlebois, 2008; Horgan, Kelly, Goodwin, & Behan, 2018; Read et al., 2014). It's important to assess the different interventions, but based on the chosen measured intervention, the following paragraphs will focus on Acceptance and commitment therapy (ACT) a third wave of cognitive behavioral therapy (CBT), the pragmatic branch of behaviorism, specifically Skinner's radical behaviorism, is the foundation for both (Hayes et al., 1988).

In Padua, the intervention approach for international students by The Psychological Assistance office, introduced in 2020 combines psychological consulting services with preventative and well-being promotion activities. It will also include psychoeducation and psychotherapy in English. The goal of psychological assistance is to assist students dealing with a variety of problems that interfere with their daily lives or academic pursuits. The

university website provides information about this service for international students. In addition, the university offers other services that may be helpful to them while they are visiting, like a welcome office, a psychiatric service, and master's students who are known as (buddies), and who will greet and assist them.

3.2. Acceptance and commitment therapy

ACT methods are acknowledged as evidence-based according to professional scientific agencies or groups, including the World Health Organization, the U.K.'s NICE guidelines, the U.S. Department of Defense, the U.S. Department of Veterans Affairs, and similar organizations around the world (see https://contextualscience.org/state_of_the_act_evidence for links to these reviews). Also, more than 445 meta-analyses or systematic, scoping, or narrative reviews of ACT (see bit.ly/ACTmetas). Steven Hayes introduced in 1980; The action-focused psychotherapy technique known as acceptance and commitment therapy (ACT), it is derived from cognitive behavioral therapy and conventional behavior therapy. Instead of resisting, denying, and battling inner emotions, the person learns to recognize that strong emotions are normal reactions to certain circumstances and shouldn't stand in the way of their progress. With this knowledge, they start to embrace their struggles and commit to altering their behavior as needed, regardless of what is happening in their lives or how they feel about it. ACT focuses not only on cognitive change but also social and verbal context because it's trying to modify the function of a situation and the personal relationship to it, that's why most research focuses on vulnerable populations (Hayes, 2023)

Six typical psychological processes that are centred on a single central idea can be used to characterize the ACT approach to psychological intervention. Figure 5 depicts these. An ACT view of psychopathology can be obtained by inverting the positive idea in each circumstance (Hayes et al., 2006); we shall do so following. The ACT model provides a functional dimension model of diagnosis as well as a model of treatment components and psychological change by defining parallel psychopathological and change processes.

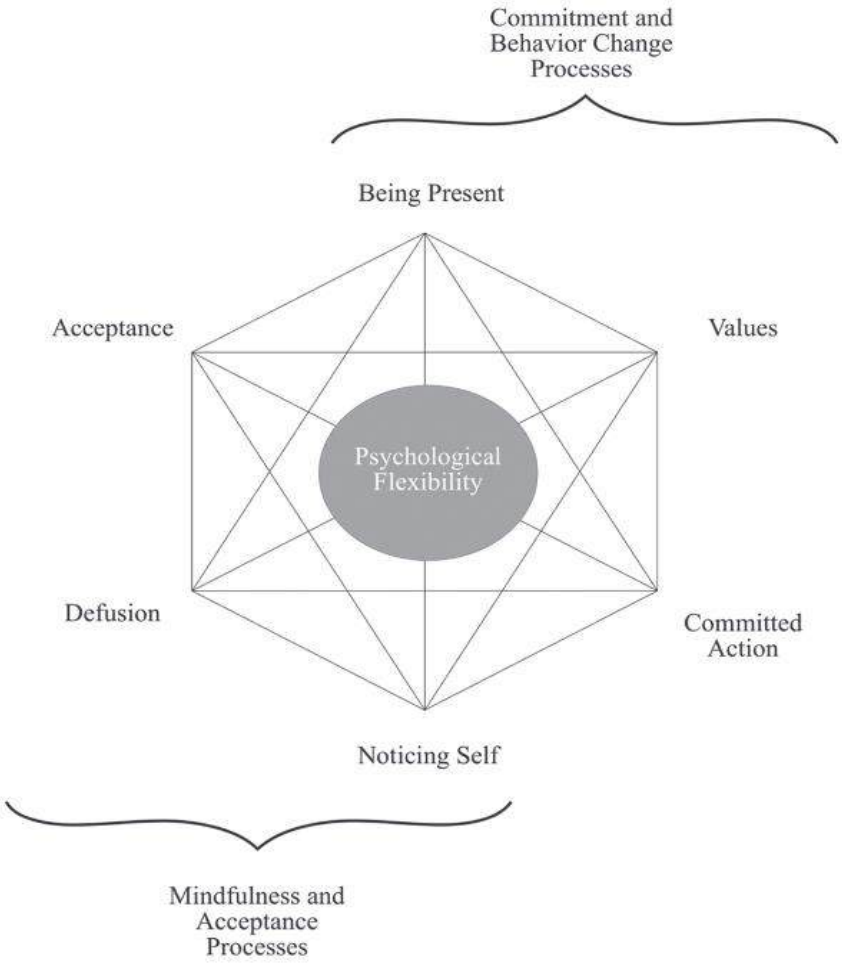


Figure 5: The ACT Model of Behavior Change

3.3. Acceptance and Commitment Therapy Interventions in Universities

Although there is large evidence on mindfulness and cognitive-behavioral interventions, review-level evidence was limited about setting-based interventions and acceptance and commitment training for students attending colleges (Worsley et al., 2022). Therefore, further primary studies examining the efficacy of setting-based interventions and acceptance and commitment training for students are required. It should be noted that some of these reviews only included a small number of studies with small sample sizes, and their findings should be viewed with some caution (Worsley et al., 2018, for links to these reviews, see https://contextualscience.org/state_of_the_act_evidence). Figure 6 is based on a literature search for empirical studies based on ACT from the year 1980 till 2018; the inclusion criteria for which ACT-tested the well-being of undergraduate students (Howell, Passmore; 2019).

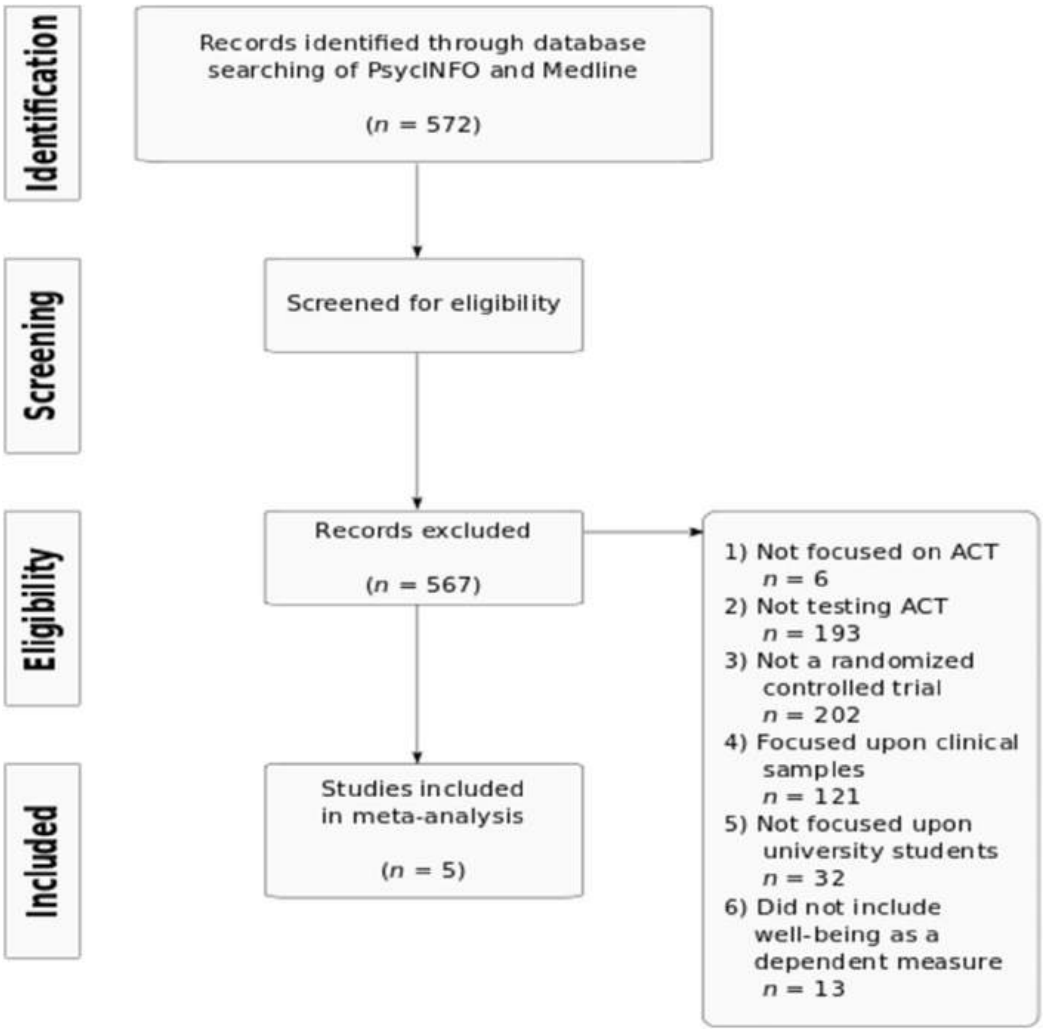


Figure 6: Diagram of the search and selection procedure for target studies (Howell, Passmore; 2019)

A review and initial meta-analysis (rated as lower methodological quality) were conducted on the impacts of ACT interventions on university student wellbeing (N = 585), including randomized controlled experimental designs. Their meta-analysis showed a small significant (pooled) effect on wellbeing (d = 0.29, 95% CI: 0.11 to 0.47, p = 0.008) when assessed with the Wellbeing Manifestations Measure Scale; ACT interventions were also found to reduce depression, anxiety, and stress (Howell, Passmore, 2019; Worsley, Pennington, & Corcoran, 2022). A study evaluated the32ounselliess of a one-session ABBT intervention with first-year law students and undergraduates; Within the first month of classes, 98 first-year students were randomized to either a waitlist control condition or a single-session, 90-minute ABBT workshop. Following the session, students reported much lower levels of depression and higher levels of acceptance. Furthermore, a decrease in despair was linked to an increase in acceptance throughout the semester (Danitz, Orsillo, 2014). Four Canadian institutions recruited students,

who were then randomized to either the intervention group or the wait-list control group. Over the course of four weeks, students in the intervention group participated in four 2.5-hour seminars and were instructed to complete exercises at home (such as observation grids and meditation). The intervention was given to wait-list students shortly after the post-measurements. Students in the intervention group demonstrated more psychological flexibility in postintervention than those in the control group, according to MANCOVAs and ANCOVAs. In addition, they reported reduced symptoms of stress, anxiety, and sadness, as well as increased well-being and school participation. When combined, the study's findings imply that using an ACT-based intervention to support mental health and academic engagement in postsecondary settings is a worthwhile endeavour (Gregoire et al., 2018). The integration of acceptance and commitment therapy with positive psychology in a school-based mental health program revealed that early intervention programs that incorporate acceptance as an emotion control method can potentially alleviate symptoms and enhance the overall health of high school children (Burckhardt et al.,2016).

Sixty college students, 53.3% of whom were male, who struggled with academic procrastination were split into two treatment groups at random—ACT and CBT—and a control group. The psychological mechanisms and symptoms of procrastination were evaluated both immediately following the end of treatment and at the 3-month follow-up. Although the short-term effects of both therapies on procrastination were impressive, the long-term effects of ACT were superior. Through treatment of both, participants saw an increase in their sense of self. Time management was more positively impacted by CBT than by ACT, even though ACT dramatically reduced negative affect and enhanced neuroticism. The results imply that whereas CBT and ACT may have different treatment mechanisms, they are both useful interventions for procrastinators (Wang et al., 2016).

3.4. Digitized interventions

Meeting students' mental health needs is a challenge for university and college counselling facilities. According to surveys of directors of college counselling centres conducted in the United States, there is a growing need for services along with a reported rise in the complexity and severity of students' problems and many also lament the lack of resources available to satisfy this demand (Gallagher, 2014). Many students who could benefit from psychiatric services never inquire about getting help (Blanco et al., 2008). Given the prevalence of mental health problems, the limitations in satisfying the demand for services and resources that are

now available, and the low rates of treatment seeking, a range of solutions are required to address the mental health concerns that universities face.

More than ever, universities must offer treatments that are both affordable and easily accessible, and that address the diverse needs of student populations in both a preventative and therapeutic capacity. Online interventions can be utilized in conjunction with teaching and other university services related to mental health and wellness or can be used independently. Nevertheless, integrating online interventions with other services could be difficult. However, it's also feasible that directed online therapies might give college students practical strategies to deal with psychological issues that may arise both during and after their studies. For many mental health issues, internet- and mobile-based interventions (IMIs) have been demonstrated to be just as successful as in-person therapies (Carlbring, Andersson, Cuijpers, Riper & Hedman-Lagerlöf 2018). IMIs also offer several benefits over these conventional formats, including anonymity and scheduling flexibility, students may be more engaged if they can complete a program at their leisure on a website, which offers convenience and anonymity, and lets people learn new skills on their schedule, without having to go to appointments or deal with the stigma attached to asking for help (Amstadter, Broman-Fulks, Zinzow, Ruggiero, & Cercone, 2009; Eisenberg, Golberstein, & Gollust, 2007).

Online self-help interventions have grown in popularity recently since they are easily accessible, reasonably priced, and offer viable alternatives for treating mental health and wellness concerns including anxiety and depression (Andersson and Cuijpers, 2009; Grist and Cavanagh, 2013; Richards and Richardson, 2012) eating disorders (Kass et al., 2014), anxiety (Schmidt et al., 2007), and alcohol use disorders (Croom et al., 2015,). There are several ways to conduct internet-based interventions, and research indicates that guided self-help interventions (participants receive human support for working through the intervention, e.g., by an e-coach giving them feedback and answering their questions) work better than self-help alone (Gellatly et al., 2007, Johansson and Andersson, 2012, Newman et al., 2011, Richards and Richardson, 2012, Spek et al., 2007). The benefits of treatment may even last over time (Carlbring, Bergman Nordgren, Furmark, & Andersson, 2009).

Guided self-help for anxiety and depression can yield benefits that are comparable to in-person therapies (Cuijpers, Donker, van Straten, Li, & Andersson, 2010). Providing guidance, however, significantly increases the cost of intervention; this has an impact on scalability and distribution (Spijkerman, Pots, Bohlmeijer 2016). By combining the cheaper costs of unguided

IMIs with the lower attrition rates of guided IMIs, minimal guidance formats may be able to get around these obstacles.

Finally, Self-assessment scales, relatable characters, voice relaxation exercises, realistic daily life activity tasks, and weekly reminders during the process are all desirable elements of internet-based therapies (Özer, Köksal, Altinok, 2024). To maximize program, reach and treat a larger range of mental health skill impairments, an intervention based on a transdiagnostic approach would be the most effective (Craske, 2012). To locate all peer-reviewed randomized controlled studies examining the effectiveness of ACT self-help on psychological flexibility (PF), anxiety, and/or depression, a thorough search of the literature was undertaken. A total of 2580 people were found and examined in thirteen different investigations. The results show that improved outcomes are achieved with increased levels of clinical supervision, but that the style of the intervention (e.g., book/computer) is unlikely to modify effects. The hypothesis that PF variations mediate distress outcomes received preliminary support when increases in PF were linked to decreases in anxiety and depression. Consequently, ACT self-help could be a good strategy, especially if professional coaching is provided. Nevertheless, any conclusions drawn are cautious because of the tiny effect sizes, short number of studies, and significant variability of outcomes (French, Moghaddam, Schröder, 2017).

3.5. Online-based ACT for university students

A transdiagnostic method that shows promise in promoting mental health skills and preventing mental health problems is acceptance and commitment therapy (Biglan, Hayes, & Pistorello, 2008; Levin, Pistorello, Seeley, & Hayes, 2014).

ACT has been proven to be beneficial as a recommended preventive treatment using a self-help book among individuals with subthreshold depression, although not having been particularly evaluated with university students (Fledderus, Bolmeijer, Pieterse, & Schreurs, 2011). Usually, ACT has emphasized goal setting and values training in an online format (Chase, 2010), as well as serving as a preventative program for college students (Levin, Pistorello, Hayes, & Seeley, 2014). There are a few restrictions, even if these studies have shown encouraging outcomes in reducing issues among university students. As an illustration, the findings indicate that gains have decreased with time (Pistorello et al., 2012), more prolonged follow-up evaluations have not been conducted (Danitz & Orsillo, 2014), and that pre-test and control conditions are missing (Boone & Canicci, 2013). In the following paragraphs, some studies will be discussed.

A study investigated whether an online psychological intervention targeted at improving students' well-being may be a useful and efficient substitute for attending to the needs of a university population (Räsänen, Lappalainen, Muotka, Tolvanen & Lappalainen, 2016). A seven-week online guided Acceptance and Commitment Therapy (iACT) intervention was randomly assigned to sixty-eight university students in Finland (N = 68; 85% female; ages 19–32) or placed on a waiting list (WLC). A pre-post design that was between groups (iACT vs. WLC) was used, and the iACT participants had a 12-month follow-up. The intervention participants conducted online tasks over the course of five weeks, were allowed to meet face-to-face twice, and got weekly written feedback via the Internet from their trained student coaches who were allocated at random. The intervention program was made available to waitlist participants shortly after the post-measurements. The iACT participants exhibited significantly larger gains in well-being (between groups, d = 0.46), life satisfaction (d = 0.65), and mindfulness abilities (d = 0.49), according to the results of this small efficacy trial. Furthermore, compared to those in the control group, iACT participants' self-reported stress (d = 0.54) and depressive symptoms (d = 0.69) were considerably lower. Over a 12-month follow-up period, these improvements persisted (d = 0.65–0.69 for primary measures within the iACT group). The findings imply that an online-based, coach-led ACT program consisting of a combination of in-person and virtual sessions may be a viable and well-liked substitute for improving college students' overall wellness.

Given the current focus on acceptance and commitment therapy (ACT) as a positive psychological intervention applied to university students, the term "training" is more appropriate than "therapy" when applied to non-clinical samples, as suggested by Levin et al. (2016).

Levin et al. (2017) applied a web-based ACT intervention based on six self-help, online sessions finished over four weeks, covering all six core ACT concepts for U.S. college students (N = 79) who self-identified as troubled or who were recruited as part of a psychology course credit were randomized to either the waitlist control condition or the ACT. As measured by the MHC-Short Form test, ACT resulted in considerably higher well-being when compared to the waiting control condition. Furthermore, comparing the ACT condition to the waiting, there were noteworthy gains in acceptance and decreases in value blockage. Further analysis revealed that modifications in acceptance and values blockage acted as a mediating factor in the changes in outcome related to distress and well-being indicators. Measures of psychological flexibility, awareness, values progress, fusion, and total distress did not show any significant

differences among situations. Haeger, Davis & Levin (2022) conducted a recent study to investigate the potential of ACT Daily, a mobile application that is based on acceptance and commitment therapy (ACT), as a useful self-guided intervention. Over the course of two weeks, 11 people with anxiety and depression who were waiting to see a college counselling center (CCC) participated in the study. Pre-post, open trial design of ACT Daily was used in this investigation. At baseline and two weeks after the evaluation, assessments were finished. The findings showed that ACT Daily was appropriate and that during the course of two weeks, participants' psychological inflexibility processes and feelings of anxiety and despair improved. Following skill coaching, app data showed significant in-the-moment improvements in psychological inflexibility, anxiety, and depression; over time, these impacts grew greater. Studies conducted particularly on college students have shown that, when used in conjunction with counselling services, ACT in the form of web-based self-help can reduce psychological symptoms and enhance academic performance (Levin, Pistorello, Hayes, Seeley, & Levin, 2015).

ACT on College Life (ACT-CL; Levin, Pistorello et al., 2014) is an initial prototype of a web-based ACT program designed to prevent mental health problems in university students, students who used ACT-CL showed improvements in their education values and program knowledge when compared to those on the waitlist. Furthermore, in comparison to the waitlist condition, students who utilized ACT-CL and experienced at least mild discomfort at baseline reported significantly better levels of anxiety and sadness (Levin, Hayes, Pistorello, & Seeley, 2016). You Only Live Once (YOLO), a web-based program for university students, aiming one or two of the six axes of ACT prove the improvement of acceptance, diffusion, valued living, and mindfulness are examples of mental health techniques that can enhance well-being, self-compassion, life satisfaction, and discomfort (Viskovich, Pakenham, 2018), students' values in the education and other domains of life are diverse. Few agreed with the principles of being adaptable, easy-going, healthy, and self-sufficient. Second, participants declared performance-focused goals as opposed to task-focused ones, which could expose them to the unfavourable consequences of evaluating oneself against others. High levels of engagement were demonstrated by the participants in the committed action exercises and experienced values (Viskovich, Pakenham, Fowler, 2021). *Internet-based, preventive intervention StudiCare Mindfulness (StudiCare-M)* presents a low-barrier, potentially resource-efficient option to improve the mental health of college students, developing more resilience can have a

significant positive impact on the well-being and functionality of society in the future (Küchler, Schultchen, Pollatos, *et al., 2020)*.

3.6. ACT for International Students

As mentioned above, the rates of psychological distress among international students are concerning. Brief interventions that promote their well-being are therefore necessary. Interventions that target psychological symptoms are necessary, but they also need to improve psychological flexibility and mindfulness, as these abilities are linked to psychological well-being (Masuda & Tully, 2012). When therapies are linked to tranquillity and well-being, rather than mental health issues, which may discourage people from seeking help because of stigma, they are perceived as less dangerous (Clement et al., 2015). Interventions focused on being present may also be modified to cater to the requirements of a particular target group. A culturally congruent recruitment strategy could be used, the content could be altered, the delivery method (such as having the intervention take place in a cultural community centre) could be changed, and the facilitator—a researcher or therapist—could be matched with the cultural background of the target group (Watson-Singleton et al., 2019). One cannot conclude the generalizability of ACT for minoritized communities due to the small sample number of participants who identified as members of racial, sexual, or gender minorities, regardless of the level of representation (Misra & al., 2023). Nonetheless, ACT may be advantageous for historically marginalized or minority communities, as several studies have shown (Fuchs et al., 2013). Cultural adaptation should be taken into consideration for intervention, it is the process of methodically adjusting evidence-based protocols or therapies such that the client's cultural practices and beliefs are reflected in the intervention's language, culture, content, and context (Bernal et al., 2009; Castellanos et al., 2020).

A great portion of research on ACT with students is conducted in the United States (Levin et al., 2014; Muto, Hayes, & Jeffcoat, 2011). However, there are also numerous studies conducted in diverse countries (Brandolin, Lappalainen, Gorinelli, Muotka, & Lappalainen, 2023). However, there hasn't been much research done on ACT about international students (Brandolin, P. Lappalainen, Gorinelli, Muotka & R. Lappalainen, 2023. One potential alternative is the widespread of self-help literature to all international students, In many mental health settings, bibliotherapy is popular and reasonably priced (Den Boer et al., 2004, Gregory et al., 2004).

East Asian students have been shown to adjust better when they possess strong emotional regulation abilities, increased openness and flexibility, and strong critical thinking abilities (Matsumoto, LeRoux, Bernhard, & Gray, 2004); they also tend to be more accepting of uncomfortable thoughts (Ting & Hwang, 2009); and their motivation is self-determined (Chirkov, Vansteenkiste, Tao, & Lynch, 2007). For instance, ACT has been investigated with positive outcomes among Chinese students studying overseas in the USA, students maintained their post-intervention decreases in physical symptoms, stress, anxiety, and depression at the one-month follow-up (Xu, O'Brien, & Chen, 2020). Another non-clinical study with a general sample of Japanese international students attending college in the United States (Muto, Hayes, & Jeffcoat, 2011), underwent the self-help intervention showed improvements in psychological flexibility, stress levels, and overall mental health, but also delayed the onset of clinically significant distress at follow-up. International students attending a Finnish university benefited from a five-week acceptance and commitment therapy (ACT) course that includes two extra individual assessment appointments. The workshop aims to assist students reduce symptoms of stress, depression, and anxiety as well as improve psychological flexibility. The workshop was well-received and statistically and clinically substantial decreases in symptoms were seen. Regression analysis showed that shifts in value-based living, mindfulness, and psychological inflexibility were predictive of symptom changes. Moreover, variations in these psychological abilities forecast variations in many forms of discomfort (Brandolin, P. Lappalainen, Gorinelli, Muotka & R. Lappalainen, 2023).

Moreover, several internet-based ACT models have been created, put into practice, and shown successfully in several randomized controlled trials (RCTs) in affluent Western nations. Nevertheless, there is little scientific support for these programs' possible effectiveness in helping young people from non-Western cultures (Zemestani, Hosseini, Petersen, Twohig, 2022). Language, stigma, and a lack of knowledge about health services are some obstacles that prevent international students from seeking treatment. These issues can be resolved with the use of culturally sensitive internet and mobile-based interventions (IMI). To enhance the well-being of culturally varied foreign student populations, StudiCareM-E may be utilized, It was assessed on a randomized controlled feasibility trial for foreign students (Balci S, Küchler AM, Ebert DD, Baumeister H., 2023). Though systematic adaptation frameworks are beginning to emerge, the adaptation of transdiagnostic therapies is rarely specified in depth in the prior literature (Loucks et al., 2022; Spanhel, Balci, et al., 2021). Furthermore, they are more enticing and have risen in popularity as a self-care tool in recent years thanks to

advertising. Therefore, there might be a different approach to connecting with overseas students who are experiencing a range of psychological issues (Balci, Küchler, Ebert, Baumeister, 2023).

Chapter 4

Doing what matters in Times of stress.

4.1 World Health Organization (WHO) intervention

Epping-Jordan, Harris, Brown, Carswell, Foley, García-Moreno, Kogan, & van Ommeren (2016) all contributed to the creation of Self-Help Plus (SH+) by the World Health Organization (WHO), a five-session group stress management program. It works well in any environment where populations are impacted by hardship. It has been demonstrated to delay the emergence of mental disorders in adults and can be used to assist lessen psychological distress in people, regardless of whether they have a diagnosable mental health issue or not. Prerecorded audio and illustrated guides are used by SH+ to teach stress management techniques. This method allows supervised non-specialists to conduct a brief SH+ training and then present it to large audiences (e.g., up to about 30 at a time). In addition to other mental health interventions or community programming, SH+ is one of several scalable psychological interventions backed by evidence that has been published by the World Health Organization, which will be discussed in the following section. Those who facilitate SH+ are the "plus" component since it is a self-help format. They play the audio, go over the skills that were introduced in the audio, offer clarifications and examples that are appropriate for the participants' culture, and read out discussion questions to make the groups interactive as they lead participants through the SH+ course, they don't act as therapists or even give recommendations.

According to the guide, in groups of up to thirty or so, participants sit together and listen to the audio during each session. It is not expected of participants to divulge a great deal of personal information to facilitators or each other; instead, the emphasis is on learning stress-reduction techniques on their own. Each of the five sessions of the course has a similar format: Reading a welcome script, turning on the audio, and assisting participants in getting comfortable are all part of the welcome process. Overview and practice: this includes introducing the topic, going over last week's events, practicing previously learned abilities, and troubleshooting. During the workshop, participants will receive guidance and practice in a new skill, along with brief group discussions. Finally, a commitment to practicing SH+ skills outside of sessions, as well as after they end, by providing guidelines for at-home practice and pointing out the pages of the illustrated book that were discussed in class.

Five fundamental abilities serve as the framework for both the training and the illustrated book, Acceptance, and commitment therapy (ACT), a type of cognitive behavioural therapy (CBT), is the foundation of SH+. Acquiring each skill is essential to understanding stress management. Every session introduces a new skill, which is covered in every book chapter.

Skill 1: Grounding: Grounding is the process of refocusing our attention from upsetting emotional storms to the here and now.

Skill 2: Unhooking: Unhooking is an extension of grounding. It entails acknowledging and recognizing uncomfortable ideas and emotions to detach from them and then returning attention to the here and now.

Skill 3: Acting on Your Values: This entails determining one's values and then acting in a way consistent with them.

Skill 4: Being Kind: This entails showing kindness to both one and other people.

Skill 5: Making Room: This is a more sophisticated method of releasing tense emotions and thoughts. It entails acknowledging and challenging ideas and emotions and letting them come and go rather than battling them.

Participants must familiarize themselves with the course materials by listening to all of the audio and practicing all of the tasks. Merely reading the course materials is insufficient. This gives a level of comprehension and insight into the skills that reading by itself cannot supply. It is encouraged for participants to practice new abilities both during and in between sessions. People can only start using essential abilities in stressful situations by repeatedly practicing them. Files can be accessible on the Internet from any device to facilitate this practice.

SH+ is a stress management intervention, it was created to help those in psychological distress, regardless of whether they meet the requirements of a diagnostic. People experiencing difficulties in environments where it could be challenging to administer or oversee psychological interventions may find SH+ to be especially helpful. Especially, People with diverse views and educational backgrounds, including those who are illiterate, can utilize SH+. SH+ is not intended for use with people who have a severe mental illness (such as psychosis, substance abuse, or a profound intellectual disability) or who are at immediate risk of suicide. If initial needs, impending hazards, and any safety concerns are sufficiently handled, people with acute requirements or those who are at risk of damage may benefit from SH+. On the

other hand, those who exhibit more needs ought to be directed to the appropriate organizations. However, Participants know that any information they divulge is kept private and confidential and that no one outside the SH+ team will receive access to it, as part of confidentiality.

SH+ has been tested in three randomized controlled trials (RCTs), and the results showed that the intervention was useful in preventing the onset of mental disorders in distressed populations affected by adversity as well as in reducing psychological distress in adults with moderate to severe psychological distress (https://www.who.int/news/item/11-10-2021-new-stress-management-course-for-people-living-with-adversity). Further results included increases in overall health, functioning, and subjective well-being as well as decreases in participant-identified personal issues and symptoms of common mental disorders (such as depression and post-traumatic stress disorder). SH+ may be modified for distribution in many modes, such as videoconferencing, podcasts, or radio. It was initially tried with in-person groups of varying sizes. This could be especially helpful in situations when participants find it difficult to meet in person due to logistical or public health issues. Such modifications might be put to the test in additional investigations.

4.2. Past Research on Self-Help Plus

With a strong emphasis on mindful practices and grounding, values clarification, and compassion (being kind to oneself and others), Self-Help Plus incorporates many of the ACT factors. Compassion also encourages a social support element through the practice of acts of kindness toward others outside of sessions. (Tol, el al. 2020). ACT has been studied previously in humanitarian settings (Stewart, White, Ebert, Mays, Nardozzi, & Bockarie, 2016; Rees, Travis, Shapiro, & Chant, 2014).

Tol, et al. (2020) sought to evaluate the efficacy of a group-based, facilitator-led self-help intervention (Self-Help Plus) in lowering psychological distress among South Sudanese female refugees. They conducted a cluster randomized study in northern Uganda's rural refugee communities. The study included females who met the threshold score of ≥5 on the Kessler 6 as having at least significant psychological distress. The intervention included five 2-hour audio-recorded stress-management classes delivered by short-trained lay facilitators, along with an illustrated self-help book, and access to standard treatment. On a 1:1 basis, villages were randomized to receive either enhanced normal care or Self-Help Plus. Houses were randomly chosen among 14 communities. Individual psychological distress was the main outcome, measured in the intention-to-treat population one week before, one week following,

and three months following the intervention using the Kessler 6 symptom checklist. Instead of measuring results at the cluster level, It was individual. Personal issues, post-traumatic stress disorder, symptoms of depression, rage, social relations with other ethnic groups, functional disability, and subjective well-being were among the secondary outcomes. 613 (88%) of the 694 eligible participants (331 in Self-Help Plus and 363 in improved usual care) finished all of the evaluations. Three months after the intervention, Self-Help Plus showed greater improvements in psychological distress compared to controls (β = −1·20, 95% CI −2·33 to −0·08; p = 0·04; d = −0·26). And greater gains for Self-Help Plus for five out of eight secondary outcomes three months after the intervention (effect size range -0·30 to -0·36). Similar benefits were obtained by refugees with varying histories of trauma, lengths of stay in settlements, and beginning psychological distress. Six adverse occurrences were reported to the independent data safety management board for safety considerations; none of these events was deemed to be concerning considering the intervention (Acarturk, et al., 2022).

495 refugees and asylum seekers with psychological distress but with no diagnostic were randomly assigned to enhanced treatment as usual (ETAU) or SH+ in a randomized controlled experiment conducted in five European nations. The frequency of mental illnesses as measured by the Mini International Neuropsychiatric Interview (MINI) at six months was the main outcome. The frequency of mental disorders after the intervention, self-identified issues, psychological symptoms, and other outcomes were examples of secondary outcomes. Results showed a substantial difference favoring SH+ at the end of the intervention, but there was no change in the primary outcome (frequency of mental illnesses after 6 months) (secondary outcome, measured within 2 weeks from the final session) (Purgato, et al., 2021).

Also, it was evaluated how well Self-Help+ worked to stop mental illnesses from developing in Syrian refugees who were feeling psychologically distressed in Turkey. Two Turkish regions hosted a two-arm, assessor-masked randomized controlled trial. Adult Syrian refugees who were feeling psychological distress (General Health Questionnaire ≥3) but who had not received a diagnosis of mental illness were eligible to participate. They were divided into two groups at random: the Self-Help Plus arm, which included both Self-Help Plus and Enhanced Care as Usual (ECAU), or ECAU alone in a 1:1 ratio. Two facilitators led five sessions of group therapy for Self-Help+. The Mini International Neuropsychiatric Interview was used to determine the primary outcome measure, which was the existence of any mental disorder at the six-month follow-up. The existence of mental disorders at the post-intervention and six-month follow-up, as well as psychological distress, signs of depression and PTSD, personally

identified psychological outcomes, functional impairment, subjective well-being, and quality of life, were all considered secondary outcome measures. Following, 642 participants were randomized to receive either ECAU (N=320) or Self-Help Plus (N=322). At the six-month follow-up, participants in Self-Help Plus had a considerably lower likelihood of having any mental problems than those in the ECAU group. The examination of secondary outcomes revealed that while Self-Help+ did not show any significant improvement in depressive symptoms, individually reported psychological outcomes, or quality of life at the six-month follow-up, it did show some positive impacts. It was discovered that Self-Help+ is a useful tactic for delaying the onset of mental illnesses (Acarturk, et al., 2022).

The present research outlines the study protocol for an RCT aimed at providing stepped care Doing What Matters Most and Problem Management Plus (DWM/PM +) intervention to Polish migrant workers residing in the Netherlands who exhibit elevated levels of distress. The intervention combines two scalable, psychosocial WHO therapies. Since International migrant workers (IMW) are marketed as a stepped-care intervention, they may reduce the time and cost associated with receiving mental health care, and the initial step alone may be enough to improve mental health. A population that finds it difficult to see a mental health professional in their new nation may find mental health care more accessible by providing this stepped-care intervention in a remote format and IMW's native tongue. Furthermore, since IMWs move frequently—both domestically and abroad—a remotely provided intervention enables ongoing treatment (Roos, et al., 2023). The first randomized trial combined two scalable psychological therapies, a five-session cognitive behavioural intervention (Problem Management Plus) and a guided self-help stress management guide (Doing What Matters in Times of Stress). Investigated the effects on self-reported symptoms of anxiety and depression in disturbed health workers and the cost-effectiveness of a stepped-care program of scalable, internet-based psychological therapies (Mediavilla, et al., 2022). Step-by-step is a guided self-help intervention that is adaptable to various contexts and resource availability based on Self-help+ and PM+ (Carswell, Harper-Shehadeh, Watts, Van’t Hof, Abi Ramia, Heim, Wenger, & van Ommeren, 2018). It is versatile enough to integrate into many health and social care systems. An RCT was conducted to assess the cost-effectiveness and efficacy of a locally customized version among Lebanese and Syrian nationals, as well as other individuals in Lebanon. The results indicated that SbS was highly acceptable. Long assessments and mistrust stemming from delayed research compensation, forgetting login credentials, bad internet connections, being busy, and conflicting demands were obstacles to feasibility. Creating an oral commitment

contract, breaking up the payment into multiple parts, and offering weekly assistance from volunteers were all examples of best practices that encouraged participants to implement the intervention (van ‘t Hof, et al, 2021; Abi Ramia, et al., 2024). Research aimed to assess the impact of a phased care approach on the mental health outcomes of adults undergoing adversity in Jordan, a low– and middle-income nation (LMIC) that requires significant support to improve its mental health system.

To investigate the effects of the stepped model of care on anxiety and depression symptoms, positive psychological well-being, agency, changes in patient-identified problems, quality of life, and cost-effectiveness, 800 adults with psychological distress were randomly assigned to receive either a self-guided course (Doing What Matters) followed by a more intensive group program (Problem Management Plus) or the self-guided course alone. It will evaluate the differential influence of the conditions over time using linear mixed models (Keyan., Habashneh, Akhtar, El-Dardery, Faroun, Abualhaija, Aqel, Dardas, & Bryant 2024). To conclude, Self-Help+ was never conducted on international students. However, it showed effectiveness regarding immigrants who struggle with acculturation stress as discussed above and has influenced the creation of other interventions. It is being measured regarding populations with low income or lack of psychological resources and workers that have to deal with performance stress. The symptoms that were measured in Self-Help+, also foreign students struggle with, which may lead us to conclude that the WHO can also be impactful on such a population.

Chapter 5

Methods

5.1. Objectives and hypotheses

The overall purpose of this study was to examine the effects of mobile application stress management training on the mental health and coping skills of international students at the University of Padua. We first aimed to measure the sources and kinds of daily stressors and how they are perceived and subsequently assess if a change could be registered after training. Because each student has his schedule, we did not have a fixed timing for the intervention but instead allowed each person to train at his own pace and without any professional guidance. We were also interested in assessing if the online intervention was effective in keeping the person engaged without a specific timetable or a guiding person to keep the participant engaged.

Specifically, we answered the following research questions:

1. How are international students feeling in terms of stress, coping skills and self-efficacy, emotion regulation, mental health, flourishing, and their perception of stress and social support before the beginning of the intervention?

Here we expect that students may have high levels of stress correlated to low coping skills low emotion regulation, and low flourishing capacities (Tsoory, Cohen, & Richter-Levin, 2007; Moore, Zoellner, & Mollenholt, 2008). Also, we expect that perceived stress may influence stress levels (Rafidah, Azizah, Norzaidi, Chong, Salwani, & Noraini, 2009) and that having social support from diverse people will also lead to a decrease in stress (Maymon, & Hall, 2021; Amini, & Samani, 2021).

2. Are students engaged in online training? That is how many students, after starting the training continue, and how many drop out? Which participants' characteristics increase the adherence to the protocol?

We expect higher rate of students actively participating in online training and completing it compared to those who are less engaged and dropping out. The dropout rate among students enrolled in online training programs may be correlated to high levels of stress (Zhao, Xiong, Zhang, & Qi, 2021; Lewis, & al., 2021).

3. Do students who complete the training better regulate stress and more specifically do they improve in terms of mental health and having better coping skills that will lead to better emotion regulation?

Here we expect that participants who have completed the whole training and have access to the material will have learned new stress-managing tools such as grounding, being kind, and so on. By doing so, we assume that their coping skills score will improve as well as their overall mental health and their stress level (Tol, et al., 2020; van ‘t Hof, et al, 2021; Abi Ramia, et al., 2024)

5.2. Participants

A total of 40 international college students currently enrolled in the University of Padua in Italy, were invited to take part in the study and initially accessed the survey. Of these, only 28 fully completed the initial survey and are considered in the present work. Exclusion criteria were not being an international student, not being enrolled at the University of Padua, or having a disability.

Table 1: Summary of the participants

Measure	Items	Frequency	Percentage	M	SD
Gender	Male	2	7%		
	Female	25	89%		
	Nonbinary	1	3%		
Age	21-38			25.03	4.07
Nationality	Middle Eastern (Saudi Arabia, Iran, Lebanon, Jordan, Qatar, Syria, Türkiye)	14	50%		
	Europeans (United Kingdom, Greece, Hungary)	6	21.50%		
	America (U.S.A, Brazil, Nicaragua)	5	17.80%		
	Central Asia and the Republic Soviet (Afghanistan, Kazakhstan, Russia, Ukraine, Uzbekistan)	2	7%		
	South Asia (Bangladesh, India, Nepal, Pakistan, Sri Lanka)	1	3%		
Degree level	Master	23	82.10%		
	Bachelor's	2	7.10%		
	Unspecified	2	7.10%		
	Erasmus for one year	1	3.50%		
Major	Psychology	14	50%		
	Food and Health and Agriculture	6	21%		
	Humanitarian	3	10.70%		
	Archaeological Studies	1	3.50%		
	Literature Studies	1	3.50%		
	Special Education	1	3.50%		
	Unspecified	2	7.14%		
SES	Average	19	68%		
	Below Average	4	14%		
	Above Average	5	18%		

The sample was 89% female, 7% male, and 3 % non-binary. Age varying between 21 and 38 with a mean of 25.03 (*SD*= 4.07). The sample was predominantly Middle Eastern 50% (Saudi Arabia, Iran, Lebanon, Jordan, Qatar, Syria, Türkiye), 21.5% Europeans (United Kingdom, Greece, Hungary) 17.8% America (U.S.A, Brazil, Nicaragua), 7% Central Asia and the Republic Soviet (Afghanistan, Kazakhstan, Russia, Ukraine, Uzbekistan), 3% South Asia

(Bangladesh, India, Nepal, Pakistan, Sri Lanka). Most participants were master students 82.1%, 7.1% Bachelor's, 7.1% Unspecified, and 3.5% Erasmus for one year. 50% were Psychology students, 21% were Food and Health and Agriculture students, 10.7% were Humanitarian students, 3.5% Archaeological studies, 3.5% literature studies, 3.5% Special Education, and 7.14% didn't mention the specialization only the level of education.

Of the 28 students 19 (68%) considered their family SES as Average, 14% as below average, and 18% as above average. Participants were not excluded from seeking psychological support with a professional, with 11% reporting seeing a therapist. Regarding social support from family, more than 50% talk at least once a day to their parents, and all participants are in contact with them. 79% share an apartment with flatmates, 7% Live on their own, 11% live in student residences, and 4 % still didn't find accommodation and must live in a hotel.

All participants dedicate some time in their week time to study and attend lessons, 79% engage in hobbies like reading, cooking, and shopping…, 68% engage in social activities (going out with friends, partying,), 25% work out during the week, and 11% dedicate time to travel. 54% practice the mentioned activities from before half alone and half with someone else, while 29% registered most of them are done alone, and 4% practice all activities alone while no one mentioned that they never do things alone. 36% mentioned them above 7 friends they can rely on in Italy, 36% between 5 and 6 friends, 21% some friends (3-4), and 7% a little (1-2).

The study was run in one cohort across the academic year 20220-2023 with no deadline for accepting participants. However, the results that will be interpreted were collected until late April for the sole purpose of presenting the study in July.

5.3. Design and procedure.

The primary methods used to attract participants were fliers distributed and hung across the psychology campus, brief in-class presentations, and oral advertising. The study's limited audience reach resulted from not informing pertinent student assistance departments/offices (i.e., the health centre and counselling centre). However, given that friend-to-friend and mouth-to-ear communication was the most effective method, it seems sense that most participants were psychology students, and no extra grades or reinforcement was given to engage in this study. Ideally, a comparison group should be considered but considering the small sample size,

it was impossible to divide them into two groups nonetheless it should be taken into consideration for future research.

Students who expressed interest had to either text or send an email to receive detailed information about the study with the survey link to give consent. To boost student feasibility and improve external validity when testing a self-help website, all participation was done remotely online via email and "Qualtrics" was used to administer the surveys (https://www.qualtrics.com/about/). Students were sent a link to the quick online survey before accessing the baseline survey with questions about well-being, psychological symptoms, and demographics, there was also an online consent form that participants had to agree with to be able to continue, after that they were asked to create their own secret identity based on their initials and birth date. The aim of the secret identity is for confidentiality purposes when accessing the application. Keeping students' identities discreet will allow them to answer more freely and honestly since sometimes some questions are too personal in the training, and having an identity will help keep track of their engagement without revealing their names. The aim is not to know their answers in the training but to assess their involvement.

After completing the baseline survey, Participants were sent another instruction email to download the application and create an account using their identity given, to have access to the training, to complete all 5 weeks' tasks. After completion, participants were asked to complete a post-survey, they were also asked to complete measures of program usability and satisfaction.

Program usage for participants was regularly monitored through the Mindlogger application system to track progress in completing the self-help sessions. Reminder prompts were sent via email and phone to those who were falling behind or inactive (i.e., collective mail reminders were sent twice a week, and participants who didn't complete any task for over a week received a text message to check on them and remind them of the training).

5.4. Measures

A first set of measures was dedicated to the investigation of mental health, stress, and flourishing first, emotion regulation and coping second, and Receiving support third of the participants by means of standardized and statistically sound scales.

The Depression, Anxiety, Stress Scale-21 (DASS) (Lovibond & Lovibond, 1995)

Although DASS-21 is the short version of DASS-42. However, it is not a clinical diagnostic tool, it is widely used in practice and research to find highly distressed people who may be at risk of developing psychopathologies in both clinical and non-clinical samples. Compared to other measures of depression or anxiety, it is preferable due to its simplicity, brevity, and capacity to capture stress symptoms in addition to those of sadness and anxiety. (Ali, Alkhamees, Hori, Kim, & Kunugi, 2021).

The responses are scored on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me all the time). A handful of items were given accompanying explanations in parentheses to minimize misunderstanding of items. The DASS yields three subscale scores for depression, anxiety, and tension/stress. The scale has good internal consistency (Cronbach α =0,83), and discriminant validity with Frost's Multidimensional Perfectionism Scale (Lovibond & Lovibond, 1995).

The Perceived Stress Scale (PSS) (Cohen 1988)

It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap into how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes some direct queries about current levels of experienced stress. The PSS was designed for use in community samples, the items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are general and hence are relatively free of content specific to any subpopulation group. The questions in the PSS ask about feelings and thoughts during the last month. Evidence for Validity: Higher PSS scores were associated with (for example): failure to quit smoking, failure among diabetics to control blood sugar levels, and greater vulnerability to stressful life-event-elicited depressive symptoms. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. The current study's Cronbach's alphas are 0,80.

The Mental Health Continuum Short Form (MHC-SF)

The MCH-SF assesses three types of well-being: psychological (autonomy and personal development), emotional (positive feelings and life satisfaction), and social (social integration and contribution). The 14-item measure has strong test-retest reliability over three months and has been validated in numerous cultural contexts (Joshanloo et al. 2013; Khumalo et al. 2012).

Diagnoses range from intermediate mental health for those who are neither languishing nor flourishing, to higher limits for flourishing mental health and lower limits for languishing mental health (Lamers et al. 2012). The current study's Cronbach's alphas are 0,78.

Recently, student samples from 38 different nations were assessed on the MCH-SF (N = 8066; Zemojtel-Piotrowska et al. 2018). Suggested using an overall mental health score, i.e., treating MCH-SF scores as a single dimension, because there was little to no difference between the subscales, especially in more collectivistic nations.

Flourishing Scale (FS)

An eight-item test of social psychological prosperity is called the FS. It encompasses the following: feeling competent, reporting meaning and purpose, feeling involved and interested, feeling optimistic, accepting oneself, forming fulfilling and helpful relationships, enhancing the well-being of others, and earning respect from others. A 7-point rating system is used to score each item, such as (I am engaged and interested in my daily activities) and (I am optimistic about my future). In samples of college students, the FS has demonstrated strong reliability and validity (Diener et al. 2010). Based on its moderate to high correlations (rs =.78, 73) with scores on various other well-being measures, the construct validity of the FS was deemed satisfactory. The current study's Cronbach's alphas are 0,78.

The Coping and Self-Efficacy Scale (Chesney, et al., 2006)

This 26-item test gauges the participant's confidence in their ability to handle challenges. Participants use a variety of coping mechanisms to report their level of confidence. Stronger scores on each item indicated stronger levels of coping self-efficacy. Parenthetical explanations were provided for a few things that included slang or terminology that could be misunderstood by overseas students. Three sub-scales have been identified using factor analysis: Getting Friends and Family, Stopping Painful Emotions and Thoughts, and Problem-Focused Coping. According to Chesney et al. (2006), the three sub-scales exhibit strong internal reliability with Cronbach alphas of 0,73, respectively. According to validity studies, the three characteristics are associated with a decrease in psychological discomfort over time (Chesney, et al., 2006).

Emotion Regulation Questionnaire (Erq) (Gross & John 2003)

A 10-item scale was designed to measure respondents' tendency to regulate their emotions in two ways: (1) Cognitive Reappraisal and (2) Expressive Suppression. Positive reappraisal was measured with the statement, "Today when I wanted to feel more positive emotion (such as joy or amusement), I changed what I was thinking about"; negative reappraisal was measured with the statement, "When I wanted to feel less negative emotion today, I changed the way I was thinking about the situation"; positive suppression was measured with the statement, "When I was feeling positive emotions today, I was careful not to express them"; and negative suppression was measured with the statement, "When I felt negative emotions today, I was careful not to express them." Responses were recorded on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The current study's Cronbach's alphas are 0,79.

Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988)

A brief test called the Multidimensional Scale of Perceived Social Support ("MSPSS") is used to gauge how supportive three people are in a person's life: friends, family, and a significant other. This 12-question test has been extensively utilized and is highly validated. High levels of perceived social support have been linked to lower levels of anxiety and depression symptomatology, according to some studies. Across many studies, the MSPSS has been shown to have good internal and test-retest reliability, good validity, and a stable factorial structure (Zimet, Dahlem, Zimet & Gordon, 1988). The current study's Cronbach's alphas 0,70.

5.5 Intervention

Mindlogger Application.

The Child Mind Institute's MATTER Lab created the Mindlogger application back in 2017 (https://mindlogger.org/), to assist more families, and use evidence-based care that is offered at clinics through programs for teaching, treatment, and research. Using MindLogger, researchers develop their mobile applications to perform evaluations, treatments, and remote data gathering. It is feature-rich and simple to use (geolocation, audio recordings, drawing, tapping, and cognitive activities, among other things). It is a Smartphone self-monitoring using ecological momentary assessment (EMA) to track mood, symptoms, and environment but also focuses on mobile interventions (Bos, & al., 2022). Personalized EMA is seen by patients and medical professionals as a helpful supplement for diagnosis and therapy (Frumkin, Piccirillo,

Beck, Grossman, & Rodebaugh, 2021; Folkersma, Veerman, Ornée, Oldehinkel, Alma, & Bastiaansen, 2021). Like this, self-monitoring of symptoms is accepted and safe across a range of psychiatric populations (Hetrick & al., 2016; Murnane, & al., 2016). Screenshots of the MindLogger mobile app's functionalities are displayed in Figure 7. We are building a public library with over 100 open-license, publicly available mental health, and cognitive examinations, and we have developed applets to conduct evaluations and treatments remotely (Klein & al., 2021).

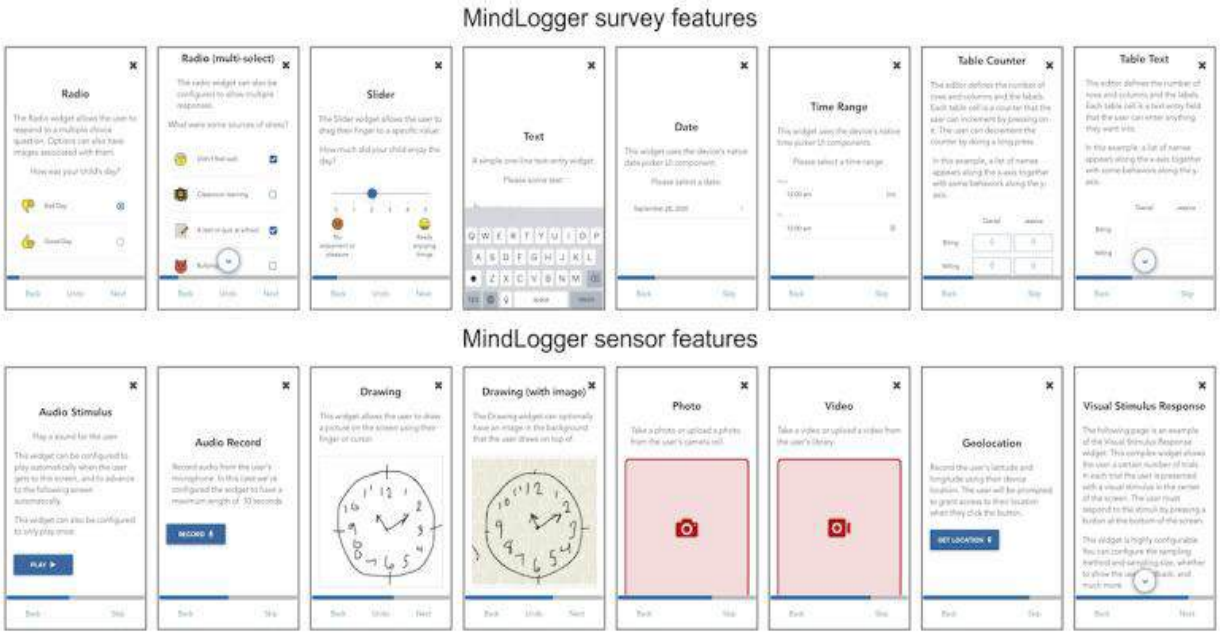


Figure 7: MindLogger screenshots showing different tasks and surveys.

The goal is to provide a globally accessible, individualized, transparent, and reliable environment for mental health assessment, therapy, and research. Drawing from extensive clinical studies, created by scientists at the top charity dedicated to children's mental health and developed following the National Institutes of Health's best principles for ethical research. By using the MindLogger platform in a large-scale, longitudinal, mobile mental health study and developing numerous other mental health-related applets, it was shown how flexible and applicable it is (Klein & al., 2021). For physicians, or researchers, switching to online self-reports should be a logical next step, especially in situations where in-person encounters may not always be possible, considering vulnerable populations. For this reason, new platforms are emerging, like MindLogger. These tools have the potential to notify and give mental health indications in the clinical whitespace since they weren't accessible (Arrow & al., 2023).

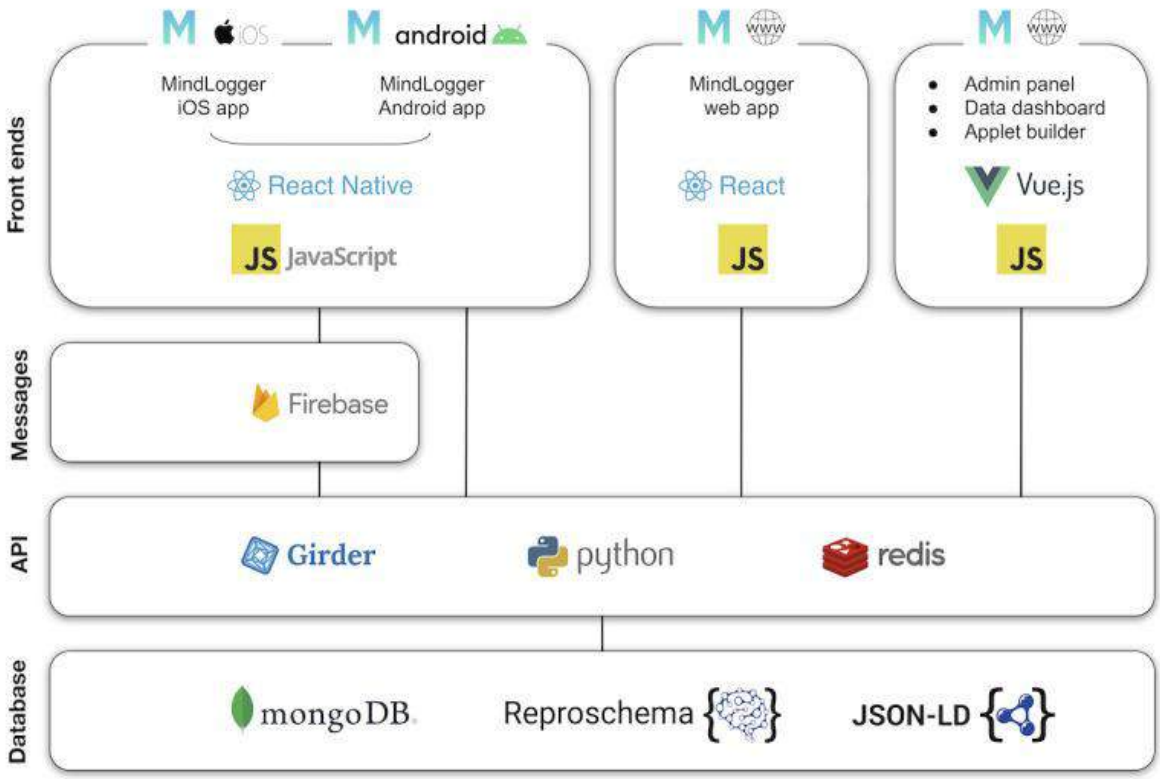


Figure 8: MindLogger software architecture diagram. API: application program interface.

The previous figure mentions the diverse software programs used to create *Mindloggers*, the web-based GitHub repositories provide access to the computer security of the application's front-end and back-end code base, which is released under the Common Public Attribution License (CPAL-1.0), a highly open-source license certified by the Open-Source Initiative. According to the license, credit must be given by (1) putting the copyright notice "Copyright I 2017 MATTER Lab at the Child Mind Institute" in the text. The Child Mind Institute logo, the MATTER Lab website URL, and the attribution line, "Child Mind Institute product intended for building applications for good," are the first four items (Klein & al., 2021).

Importantly, Mindlogger provides security and data protection by creating secret identities and storing the data with a code. In addition, given that students were not supported by a clinician during the intervention, it was given to participants the option to complete the training at their own pace and at any time without any specific deadline, so they don't feel pressured to achieve a task nor sacrifice their time to complete it.

Self-Help+ Training:

It is important to differentiate between an illustrated handbook for stress management and overcoming hardship called D*oing What Matters in Times of Stress*. The goal of the handbook is to provide readers with useful coping mechanisms. It only takes a few minutes a day to practice the self-help methods. Both the guide and the audio exercises that go with it can be used (https://www.who.int/publications/i/item/9789240003927). And Self-Help Plus (SH+), WHO offers a 5-session stress management training for big groups (up to 30 individuals). Stress management techniques are taught using pre-recorded audio and the illustrated guide by supervised, non-specialist facilitators who have completed a brief training session. Any adult who encounters stress, regardless of where they reside or their circumstances, can benefit from this training (https://www.who.int/publications/i/item/9789240035119). Because of its design, SH+ is ideally suited to be used in conjunction with other mental health therapies, as the initial phase of a tiered care program, or as a community intervention in conjunction with more extensive community programming.

The layout and the division of training were based on SH+ but the information and the training are based on the book and some information and examples were modified to suit international students.

The training used the pre-recorded audio and the pictures of the book to deliver the majority of the content. Delivered across five weekly sessions each session is divided into 3 to 5 days of training and the other days are used to practice on their own. Each session was divided into more than one day because a normal session consisted of 50 minutes of pre-recorded audio and 30–40 minutes of interactive activities, including discussions in pairs, summing it up to over an hour of training, which can be boring if you are doing it alone. Participants were given the freedom to practice according to the plan or at their own pace. Some participants preferred to do the entire training at once, while others took 5 days to complete it and others. It is important to remember that the goal is to test the effectiveness of the tools given but not the period of the training, therefore it Is up to participants to practice according to their times. The division of the sessions just constituted a suggestion. In addition, the information on the application is always available for them to go back to, and the book was shared with them to reinforce the training. The tasks were easy to learn and can be used for just a few minutes each day to help reduce stress. Participants can train at home, during break or rest periods at university, before

going to sleep, or any other time when they might have a few moments to concentrate on taking care of themselves.

All the sessions were divided in the same format since SH+ has the same format for all of it is five sessions.

- Welcoming participants and starting the audio
- Introduction and review of previous skills
- Practice of a new skill and some short discussions in pairs
- Commitment to practice SH+ skills between sessions.

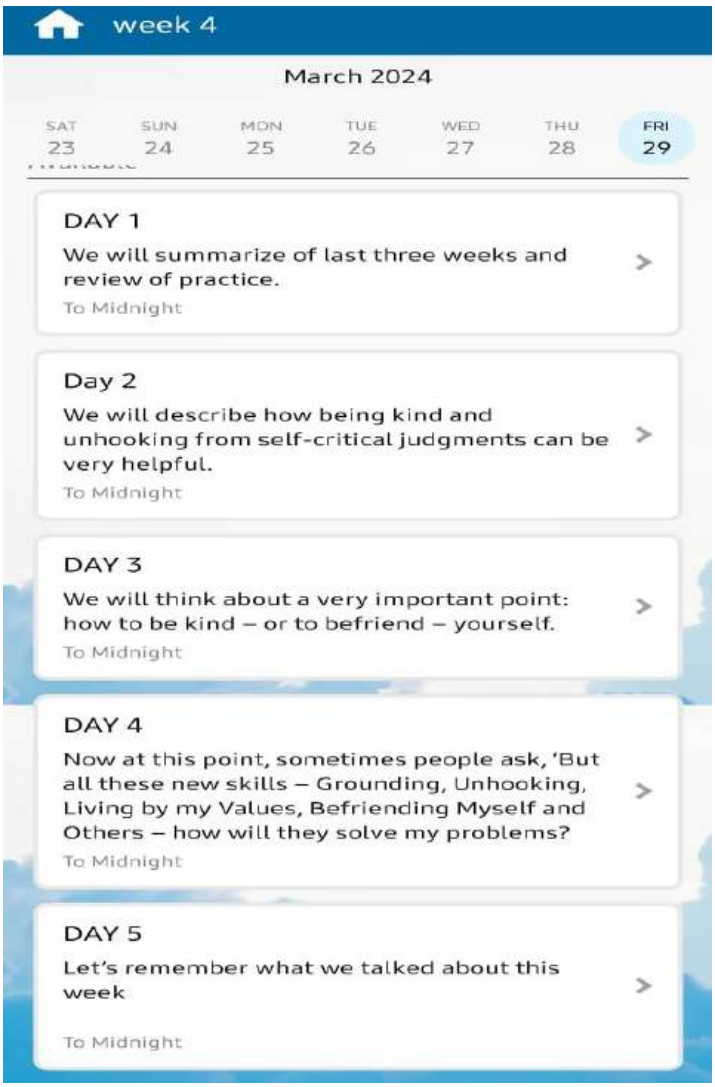


Figure 9: week 4 of the training shows the different division of a session into 5 days according to the original format of SH+

Figure 9, explaining the division of a session. For example, the first day is about welcoming participants back and reminding them of the previous sessions conducted, the second day is about introducing the new skill and having a small discussion by asking questions to participants. The third day is digging deeper into the concept in this case here is being kind and adding newer tools and information, the fourth day is concluding the new concept, and the fifth day is summarizing all the information gained from previous sessions also and helping participants creating a practice plan for the following days by asking questions such: when do you think you can apply be kind? How can you be kind? And reminding of ways to remember to practice such as setting an alarm. For all tasks, participants had to answer questions to keep them engaged in the task and also a way to help organize their plans and make them more committed to it by having to write them.

The idea from acceptance and commitment therapy, which is fundamental to the SH+ course, is that trying to ignore or conceal unpleasant thoughts and emotions can exacerbate them. Five fundamental abilities serve as the framework for both the training and the illustrated book. Acquiring each skill is essential to understanding stress management. Every session begins with the introduction of a new skill, which is then revisited in every book chapter.

Session 1. Grounding: Grounding refers to bringing our attention back to the present moment, instead of being caught up by distressing emotional storms.

Session 2. Unhooking: Unhooking builds on grounding skills. It involves unhooking from difficult thoughts and feelings by noticing and naming them, and then refocusing on the present moment.

Session 3. Acting On Your Values: This involves identifying personal values and then behaving in a way that is in line with these values.

Session 4. Being Kind: This involves directing kindness towards oneself as well as towards others.

Session 5. Making Room: This is a more advanced technique for unhooking from difficult thoughts and feelings. It involves noticing and naming difficult thoughts and feelings and allowing them to come and go, instead of fighting with them.

Those five sessions are based on the six pillars of ACT, Grounding refers to the core of being present and aware of one’s own emotions and surroundings.

Ethically, the training was conducted in a way to respects gender, diverse cultures, and is free from any discrimination. Culture played a huge role in the writing of the training to ensure that the examples were appropriate and relatable to everyone from diverse ethnic backgrounds.

Chapter 6

Results

6.1. Statistical approach

To answer our research questions data were analysed as follows:

1. Descriptive statistics were run on pre-intervention data and data were observed to look at data distribution and possible outliers in both the dropout group and completers group.

2. Several correlations among variables were computed to study the relationship between variables before the intervention.

3. Descriptive statistics were performed to look at data post intervention.

4. Data were also qualitative observed to assess the pre-post intervention participants gave on the different scales. As well as the relationship between variables at T2.

Data were analysed using R version 1.3.1093 (R Core Team, 2015). The "lme4" package was used to run the regression (Bates, Maechler, Bolker, & Walker, 2015) and the "ggplot2" package was used to obtain the graphical effects (Wickham, 2005).

6.2. Pre-intervention assessment

Mental health and wellbeing

To look at answers given by participants before the intervention descriptive statistics were performed and data's distribution was observed.

As a first step we considered participants' overall metal health and life satisfaction in terms of stress, anxiety, and depression symptoms (see DASS-21 in Table 2), perceived stress scale (see PSS, Table 2) and the general wellbeing (see MCH-SF, Table 2), as well as Flourishing scales (see FS, Table 2).

As seen in Table 2, the three subscales of the DASS-21 are mostly below average with higher scores for the stress level, followed by depression and anxiety. The total scores were overall below average, showing moderate to high variability, indicating a wide range of emotional distress, some may experience minimal symptoms, others have high level of distress. Stress having the highest mean, suggest that stress is more common and severe in the sample.

The Perceived Stress Scale revealed a below average level of students' perceived stress that fell in the moderate stress range of 11-35. Having 40 as the highest score achievable, it shows that some participants reported some levels of stress relatively high.

The MCH-SF describes participants' well-being: psychological, emotional, and social. Within this group students reported an average level of overall mental health with a high degree of variability and a wide range suggesting that while some participants may have low levels close to 17 of mental health others have way better with a score close to 60 (The maximum score is 70).

The Flourishing scale describes competence levels and life meaning and fulfilment revealed high level of positive mental health among international students, there is moderate variability. The range 35-56 indicates that all students scored high on the scales with 35 being the lowest score.

Regarding mental health, Participants reported better flourishing and well-being scores compared to stress symptoms and perceived, indicating that they maintain a positive outlook and life purpose even in the presence of stress. Nonetheless, the high variability in the scales specially MHC-SF indicates that diverse experiences are presented.

Table 2: Descriptive statistics for the metal health and stress scales

Scale	Sub-scales	***Mean***	***SD***	***Range***
DASS-21	Anxiety symptoms	5.39	4.17	0-17
	Depression Symptoms	5.82	4.77	0-17
	Stress symptoms	9.29	4.68	1-16
	Overall score	20.50	11.91	1-46
PSS		20.86	5.58	11-35
MHC-SF		40	11.24	17-60
FS		45.71	5.75	35-56

Correlations between variables revealed that, as shown in Table 5, all mental health and stress scales were corelated. Specifically, between PSS and DASS-21 indicating a strong positive correlation, revealing that higher levels of depression, anxiety, and stress are associated with higher perceived stress. The positive correlation between the perceived stress scale and the total DASS score is also presented in Figure 10. There is a moderate negative

correlation between DASS-21 scores and flourishing. This suggests that higher levels of stress, anxiety, and depression are associated with lower levels of flourishing. There is a moderate to strong negative correlation between DASS-21 scores and MHC-SF scores, indicating that higher stress levels are associated with lower well-being.

There is a moderate negative correlation between the Flourishing Scale and perceived stress, suggesting that higher flourishing is associated with lower perceived stress. There is a moderate negative correlation between MHC-SF scores and perceived stress, indicating that better mental health is associated with lower perceived stress. There is a moderate positive correlation between MHC-SF scores and the Flourishing Scale, suggesting that better mental health is associated with higher levels of flourishing.

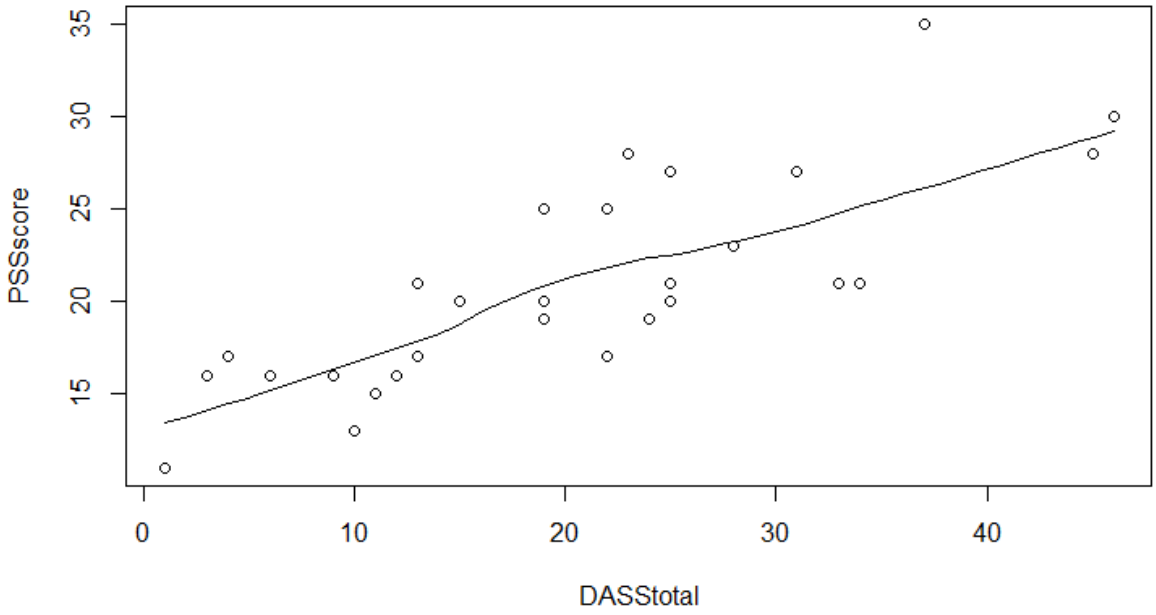


Figure 10: Positive correlation between DASS-21 scale and perceived stress scale.

Coping skill and emotion regulation

As a second step we looked at the descriptive statistics of variables related on how students cope with stress, and on their trait emotion regulation.

As shown in table 3, from the Coping and Self-Efficacy Scale indicate that students feel confident using the Problem-Focused strategy, the range shows a widespread indicating that not everyone are fully able to apply this strategy while others are feeling very confident. Then, participants tend to use stopping themselves of thinking or dealing the problem, the avoidance

range varies widely. Receiving support from others has the lowest score but still it has a moderate mean with a wide variation indicating variability in seeking social support. The total mean indicates an overall to moderate coping abilities with a wide range variability indicating that some are better to deal than others.

The emotion regulation scale revealed that most students apply more cognitive reappraisal to regulate their emotions than emotional suppression. The range from 14 to 39 shows that while some participants use reappraisal less frequently, others use it quite frequently. Suppression is used way less having a low range of 6 indicating that some rarely use it and high score of 23 showing that some use it more frequently. The mean total reflects an average use of emotion regulation strategies with a moderate variability.

Table 3: Descriptive statistics for coping skills and emotion regulation

Scale	Sub-scales	***Mean***	***SD***	***Range***
CSES	Problem-Focused Coping	74.96	16.05	36-109
	Stopping	51.46	11.38	30-79
	Support From Others	31.64	7.88	12-44
	Overall Score	158.10	29.75	102-223
ERQ	Reappraisal	27.82	5.45	14-39
	Suppression	13.36	4.40	6-23
	Overall Score	41.18	8.31	71-103

We then performed several correlations to see whether in this group of student's mental health and perceived stress were associated with specific coping strategies, perceived support, and ER. As shown in Table 5, there is a moderate to strong negative correlation between DASS-21 and the Coping Skills scores, indicating that effective coping strategies are associated to lowering stress levels. The negative correlation between the coping skills scale and the total DASS score is also presented in Figure 11. There is a moderate negative correlation between coping skills and perceived stress, suggesting that better coping strategies are associated with lower levels of perceived stress. There is a moderate positive correlation between coping skills and the Flourishing Scale, indicating that effective coping strategies are associated with higher levels of flourishing. There is a moderate to strong positive correlation between coping skills and MHC-SF scores, suggesting that effective coping strategies are associated with better mental health.

There is a weak positive correlation between coping skills and emotion regulation, indicating a slight association between effective coping strategies and better emotion regulation. However, there is a weak negative correlation between emotion regulation and stress levels, with a correlation coefficient of -0.2, suggesting that better emotion regulation is slightly associated with lower DASS-21 scores.

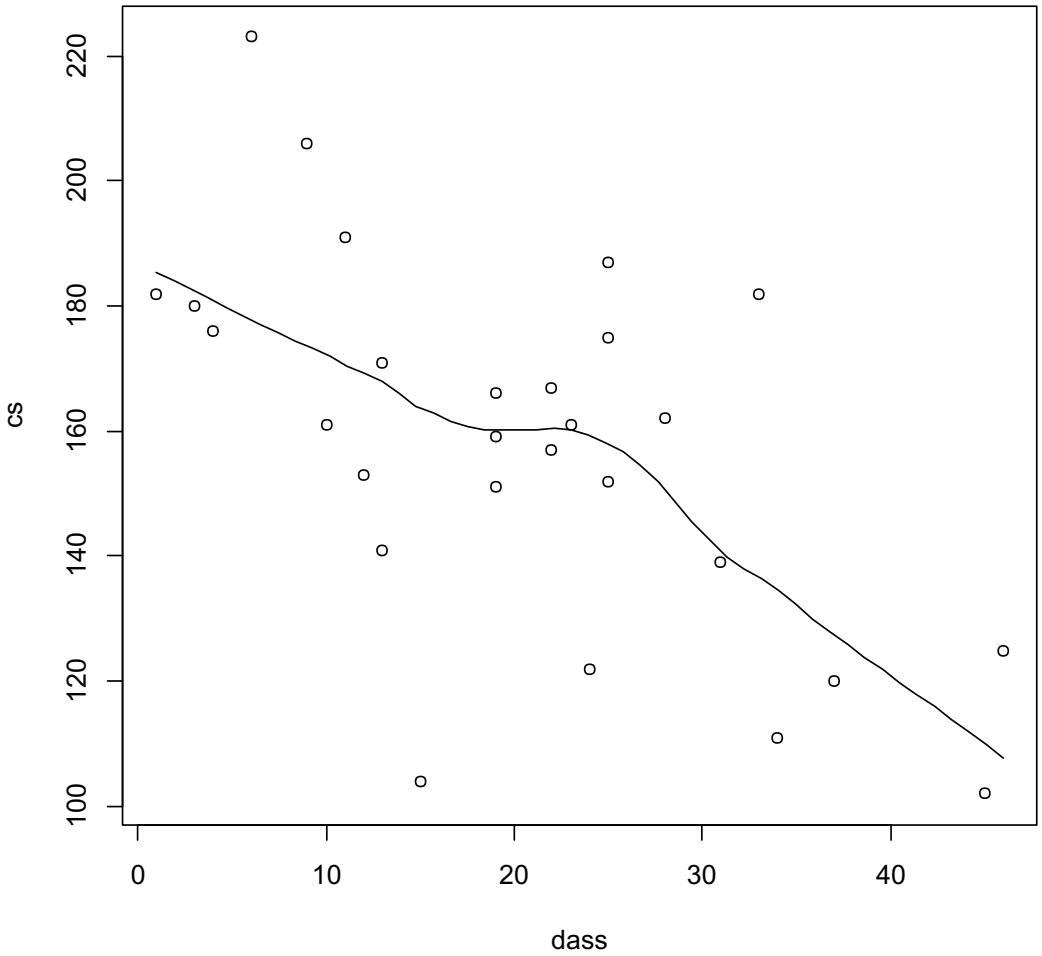


Figure 11: Negative correlation between DASS-21 and coping skill scale.

Perceived social support.

As a third step we looked at the descriptive statistics of variables related on how students cope with stress, and on their trait emotion regulation.

The multidimensional scale of perceived social support revealed that participants seek from their friends first and lower variability compared to the other sub-scales, from a significant other and lastly from family. Overall, the mean of each subscale is high indicating positive

perceived social support. There is wide variability among participants suggesting that while most feel well-supported, there are differences in the extent of this support. In family, the range of 4-28 indicates that perceptions of support vary widely, from very low to very high.

Table 4: Descriptive statistics for perceived social support

Scale	Subscales	***Mean***	***SD***	***Range***
MSPSS	Significant Other	23.25	5.56	8-28
	Family	21.57	6.18	4-28
	Friends	23.36	3.42	14-28
	Overall Score	68.18	12.65	37-84

Correlations between variables revealed that, as shown in Table 5, There is a weak negative correlation between DASS-21 scores and perceived social support, suggesting that greater social support is slightly associated with lower levels of stress, anxiety, and depression. There is a moderate positive correlation between perceived social support and the Flourishing Scale, indicating that greater social support is associated with higher levels of flourishing. here is a moderate positive correlation between perceived social support and MHC-SF scores, suggesting that greater social support is associated with better mental health. There is a weak negative correlation between perceived social support and perceived stress, indicating that greater social support is slightly associated with lower levels of perceived stress. There is a weak positive correlation between emotion regulation and perceived social support, suggesting a slight association between better emotion regulation and greater social support.

Finally, DASS-21 revealed strong positive correlation with perceived stress and moderate to strong negative correlations with coping skills, mental health, and flourishing. While Coping Skills revealed moderately to strongly positively correlated with social support, mental health, and flourishing, and negatively correlated with perceived stress. The MHC-SF is moderately positively correlated with flourishing and social support, and moderately negatively correlated with perceived stress. The Emotion Regulation scale is weakly correlated with other measures, with a slight positive association with social support and a slight negative association with perceived stress. The Perceived Social Support is moderately positively correlated with flourishing and mental health, and weakly negatively correlated with perceived stress.

These correlations highlight the interconnectedness of stress, mental health, coping strategies, emotion regulation, and social support, providing a comprehensive understanding of how these variables interact to influence overall well-being.

Table 5: Correlation of the scales

Measures	DASS-21	CS	MHC	ERQ	MSPSS	FS	PSS
DASS-21	1	-0.61	-0.59	-0.28	-0.32	-0.54	0.80
CS		1	0.60	0.18	0.59	0.46	-0.50
MHC			1	0.38	0.51	0.53	-0.43
ERQ				1	0.1	0.43	-0.15
MSPSS					1	0.39	-0.15
FS						1	-0.51
PSS							1

6.3. Who dropped out?

Of the initial group of students, more than half dropped out and decided not to complete the training. We were interested in understanding what characterized these students and how they differed from the ones that completed the intervention.

Demographic and general satisfaction

Figure 12 describes the frequency of the main reasons why participants dropped out. Most of them just decided not to take part in the study explicitly saying so, while others by ignoring the emails. Five participants decided to drop out because they felt pressured to complete it, didn't feel it was effective. While one participant had to drop out due to some medical problems enabling them to be engaged in the training. Three participants left the country either for internships or going back home which immediately exclude them from the study. Three participants indicated their interest in continuing the training but didn't have the enough time

to complete it before the deadline due to academic pressure or forgetting to use the application, therefore they were also excluded. Five participants didn't reply nor to the emails or the text messages and didn't give the reason of dropping out.

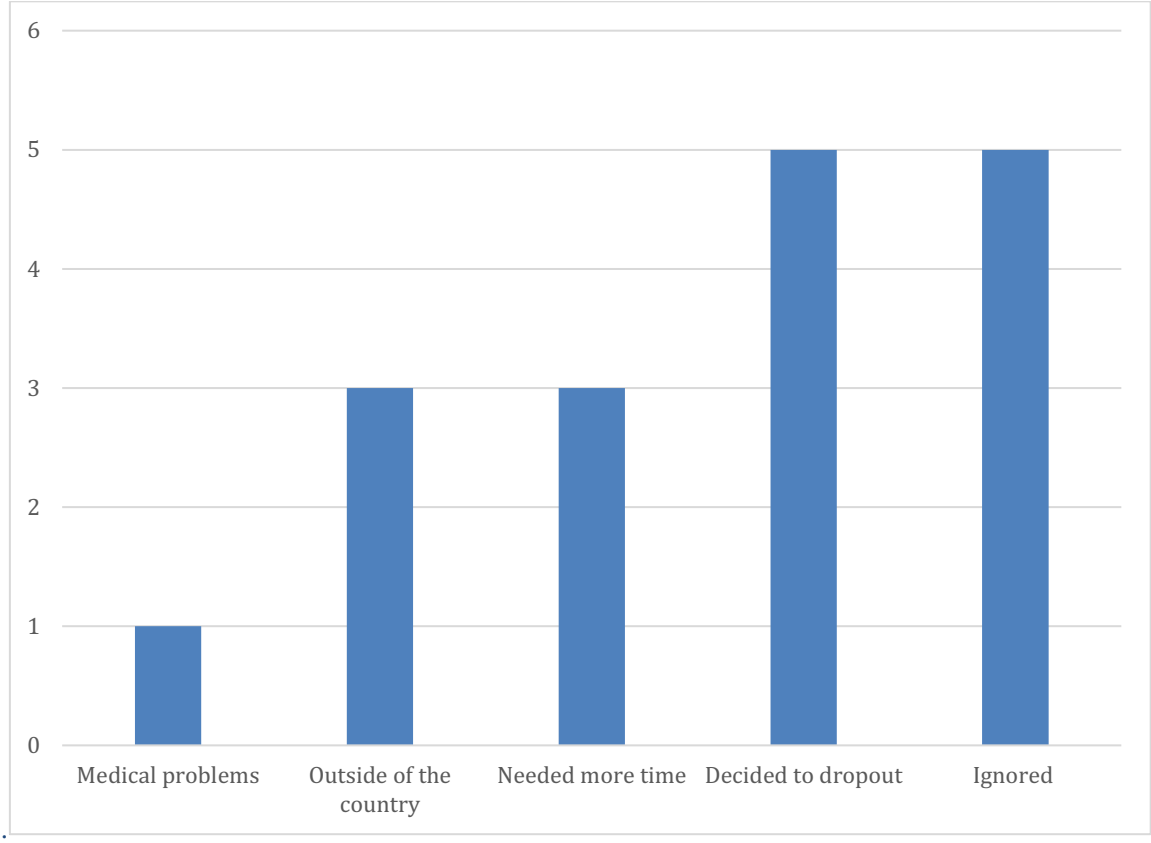


Figure 12: Histogram of dropouts' categories

According to Tabel 6., this analysis provides insights into the demographic factors associated with dropout and completion rates among the participants. The dataset reveals a notable gender disparity among the dropout group compared to those who completed their program.

The dropout group includes 2 males and 1 nonbinary participant, while the completed group consists entirely of females. Females represent the majority in both groups, but there are no males or nonbinary individuals in the completed group.

Most participants are from the Middle Eastern region are in the completed group (8 out of 11). European participants are more prevalent in the dropout group (5 out of 17). Participants from America are evenly distributed, with a slight majority in the dropout group. Participants from Central Asia, the Republic Soviet, and South Asia are only present in the dropout group.

Most of both dropout and completed groups are master's students. There are 2 bachelor's students in the dropout group and none in the completed group. One participant in the completed group is on an Erasmus program for one year, which may indicate a different level of commitment, or goals compared to regular degree-seeking students. Psychology students are the largest group in both the dropout and completed categories. The higher dropout rate in Psychology could indicate specific challenges within this field, such as resistance. There is a notable number of unspecified majors in the completed group, which could indicate a broader range of interests or undecided majors among those who completed. Other majors such as Archaeological Studies, Literature Studies, and Special Education are only found in the dropout group.

Most participants in both groups have an average SES, there are more participants with below-average SES in the completed group (3 out of 11) compared to the dropout group (1 out of 17). Participants with below-average SES are more likely to complete, contrary to the expectation that lower SES might be associated with higher dropout rates, A higher proportion of dropout participants have an above-average SES compared to those who completed the study.

Table 6: Demographic characteristics between the two groups.

Measure	Items	DROPOUT (n=17)	Completed (n=11)
		Frequency	Frequency
Gender	Male	2	0
	Female	14	11
	Nonbinary	1	0
Nationality	Middle Eastern	6	8
	Europeans	5	1
	America	3	2
	Central Asia and the Republic Soviet	2	0
	South Asia	1	0
Degree level	Master	14	9
	Bachelor's	2	0
	Unspecified	1	1
	Erasmus for one year	0	1
Major	Psychology	9	5
	Food and Health and Agriculture	4	2
	Humanitarian	1	2
	Archaeological Studies	1	0
	Literature Studies	1	0
	Special Education	1	0
	Unspecified	0	2
SES	Average	12	7
	Below Average	1	3
	Above Average	4	1

According to Tabel 7., this analysis provides insights the differences in the two groups in their connection and engagement with their families or friends and overall satisfaction. The frequency of talking to families every day is equal between the dropout and completed groups.

Dropouts are more likely to talk to their families twice a week or more than once a day compared to those who completed. There is a notable presence of participants who talk to their families every month in the completed group, but none in the dropout group. Daily communication is higher among completers, which may imply better family support for those who complete their programs.

Completed participants are more likely to have a greater number of friends (+7). Dropout participants tend to have fewer friends, with a significant portion having some or a lot of friends, but fewer have a great deal or a little. This suggests that stronger social networks might correlate with program completion, having more friends might be correlated to be more engaged in completing the training. Both groups engage in activities half alone and half with a friend almost equally. More dropouts tend to do most of their activities alone compared to those who completed. Dropouts have a significant portion who rarely do activities alone. The distribution indicates a similar pattern in both groups balance solitary and social activities, engaging in activities alone or with someone may not influence the completion of the training.

Satisfaction with studies is generally higher among dropouts, though both are probably satisfied. Higher dissatisfaction with the studies might be correlated to completing the training. There is one participant in the completed group who is “definitely not” satisfied with their studies.

Life satisfaction shows mixed results, life satisfaction is higher among dropouts, with more indicating "probably yes.". Completed participants have a notable number indicating "definitely not" satisfied with their life., higher life dissatisfaction among completers could reflect broader personal challenges beyond academic settings, however most dissatisfied with life completed the whole training.

Psychological support is predominantly received by dropouts, A very small number of participants in both groups are receiving psychological support.

These observations suggest various factors that could influence dropout rates, including social interactions, satisfaction with studies and life, and the lack of psychological support. The higher life satisfaction among dropouts is counterintuitive and may warrant further investigation. Additionally, the role of SES in dropout rates and the significance of maintaining social connections and activities also emerge as critical factors.

Table 7 Measure of satisfaction and social engagement between the two groups.

Measure	Items	DROPOUT (n=17)	Completed (n=11)
		Frequency	Frequency
Talking To Their Families	Everyday	7	7
	Every Week	4	2
	Twice A Week	3	0
	More Than Once a Day	3	1
	Every Month	0	1
Number Of Friends	Great Deal (+7)	4	6
	A Lot (5-6)	6	4
	Some (3-4)	5	1
	A Little (1-2)	2	0
Activities Done Alone	Half Alone Half with A Friend	8	7
	Most Of Them	5	3
	All Of Them	0	1
	Rarely Any of Them	4	0
Satisfaction With the Studies	Probably Yes	10	5
	Might Or Might Not	4	2
	Probably Not	3	3
	Definitely Not	0	1
Life Satisfaction	Definitely Yes	2	2
	Probably Yes	8	2
	Might Or Might No	5	3
	Probably Not	2	2
	Definitely Not	0	2
Receiving Psychological Support	Yes	1	2
	No	16	9

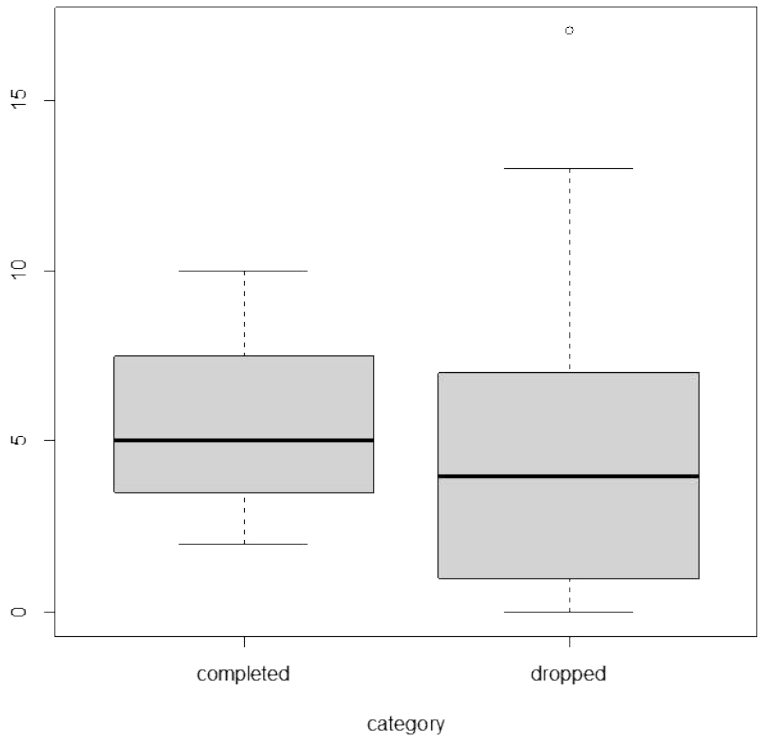
Mental health and wellbeing:

In relation to mental health, students that dropped out and the ones that completed the intervention where not very different from a qualitative point of view. Specifically, as reported in Table as seen in table 8., The mean anxiety scores are quite similar between the two groups with slightly higher variability in the dropout group. The mean anxiety scores are comparable, indicating no significant difference in anxiety levels between the two groups (Refer boxplot 1.). Both groups have similar depression scores with slightly higher means in the completed group. The ranges and standard deviations are also similar, suggesting comparable variability.

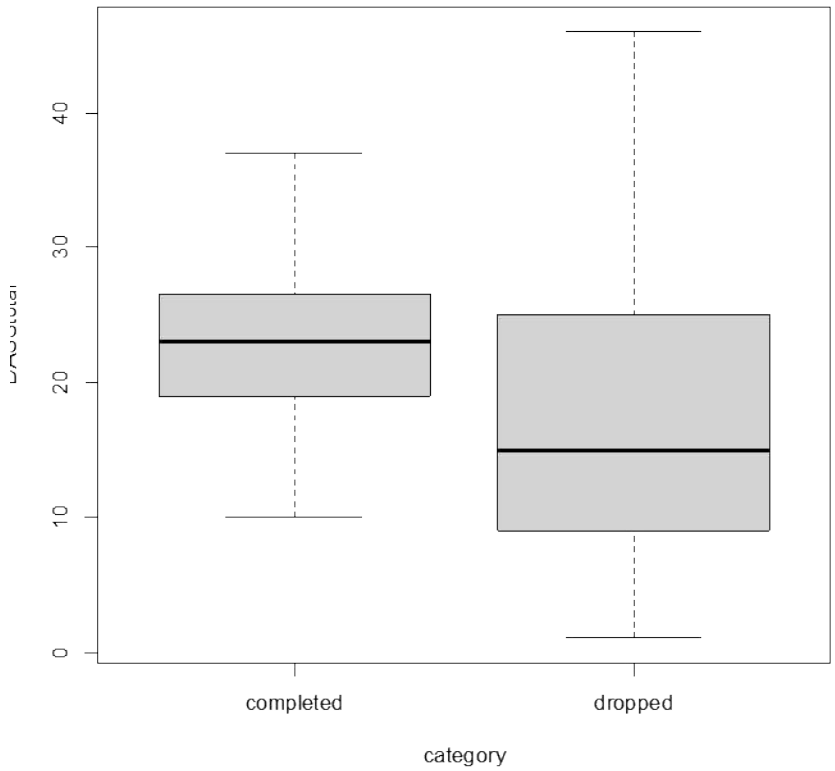
The completed group reports higher mean stress scores compared to the dropout group. The dropout group shows more variability in stress levels. The total scores are higher for the completed group, indicating higher overall levels of depression, anxiety, and stress; however, the dropout group shows greater variability in total scores (Refer boxplot 2.).

Table 8: Scores of mental health for the two groups

Measure	Items	Dropout (N=17)			Completed (N=11)		
		M 1	SD	Range	M 2	SD	Range
DASS-21	Anxiety Symptoms	5.29	5.04	0-17	5.54	2.5	2-10
	Depression Symptoms	5.41	4.80	0-17	6.45	4.88	1-16
	Stress Symptoms	8.17	5.00	1-17	11	3.71	6-16
	Overall Score	18.88	13.85	1-46	23	8.07	10-37
PSS		19.47	4.96	11-30	23	6.03	13-35
MHC-SF		38.71	12.21	17-60	42	9.77	22-54
FS		45.82	6.02	37-56	45.55	5.59	35-53

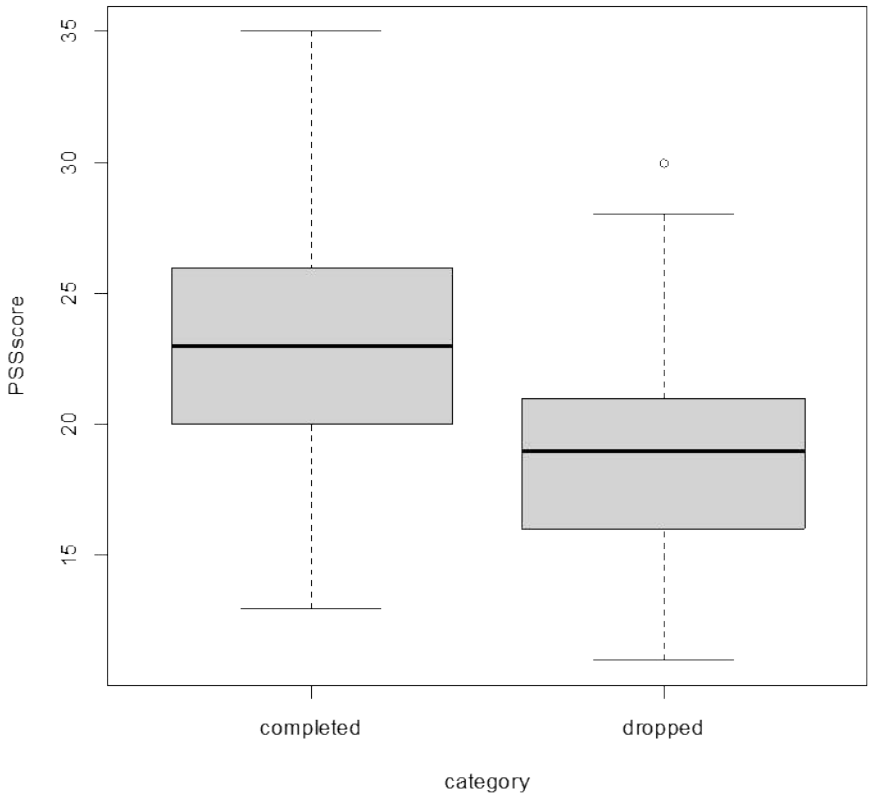


Boxplot 1: variability in anxiety between the two groups

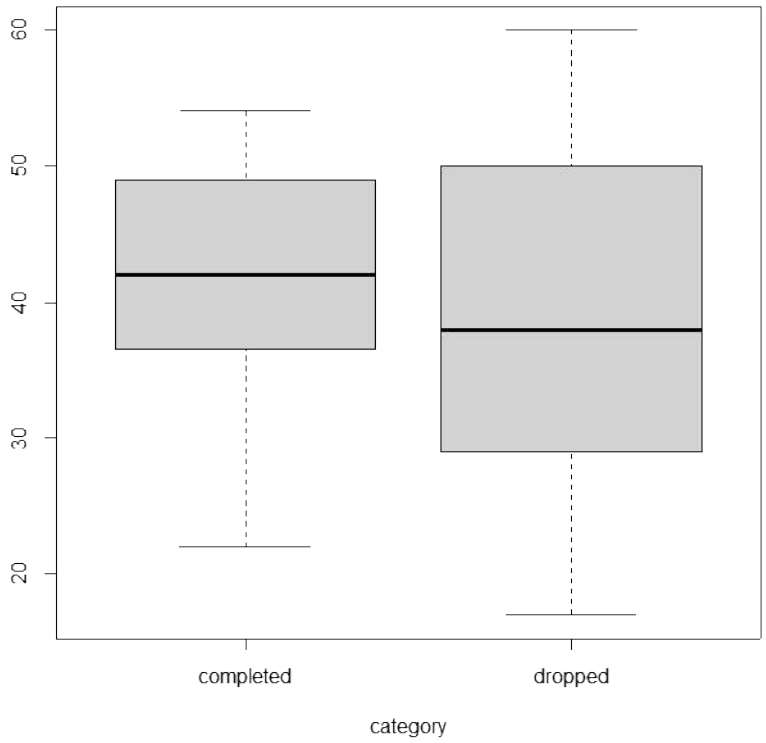


Boxplot 2: variability on DASS-21 between the two groups

Perceived stress levels are higher in the completed group compared to the dropout group. This aligns with the higher stress scores observed in the DASS-21 for the completed group (Boxplot 3.). Regarding MHC-SF, higher mean scores in the completed group suggest better mental health, with less variability compared to the dropout. (Boxplot 4.) With M1= 45,82 and M2= 45,55; Very similar flourishing scores between the two groups, indicating comparable well-being and positive functioning.



Boxplot 3: variability perceived stress scale between the two groups



Boxplot 4: variability of the mental health scale between the two groups

The analysis indicates that participants who completed the study tend to have higher levels of stress and perceived stress, but also slightly better overall mental health compared to those who dropped out. Interestingly, flourishing levels are similar in both groups. These findings suggest that while higher stress levels may be present in those who complete the study, they might also have better coping mechanisms or support systems contributing to their higher mental health scores.

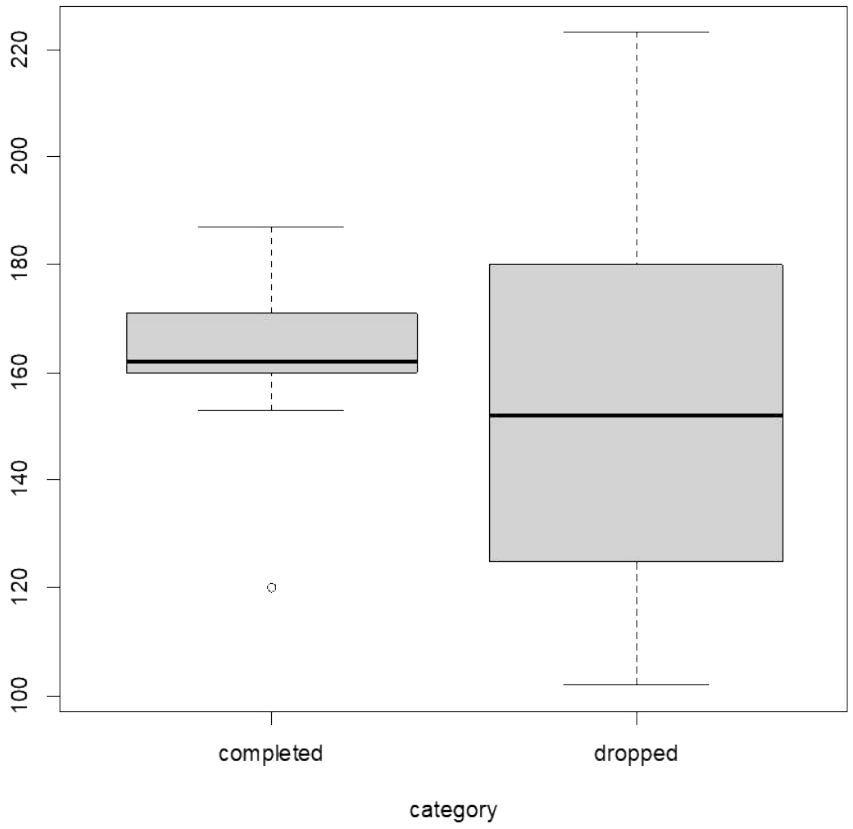
Coping skill and emotion regulation:

In relation to capacity to adapt, as reported in Table as seen in table 9., the completed group has slightly higher problem-focused coping scores with less variability compared to the dropout group, indicating that those who completed the study tend to use problem-focused coping strategies more consistently. Stopping scores are almost identical between the two groups, suggesting that the frequency or effectiveness of using "stopping" as a coping strategy is similar among both groups. Support from others is slightly higher in the completed group, though the variability is also higher. This indicates that those who completed the study may receive more support from others, which could contribute to their ability to persist. The total coping skills score is higher in the completed group, indicating overall better coping skills among those who completed the study. The variability is also lower, suggesting more consistency in coping strategies among completers (boxplot 5.)

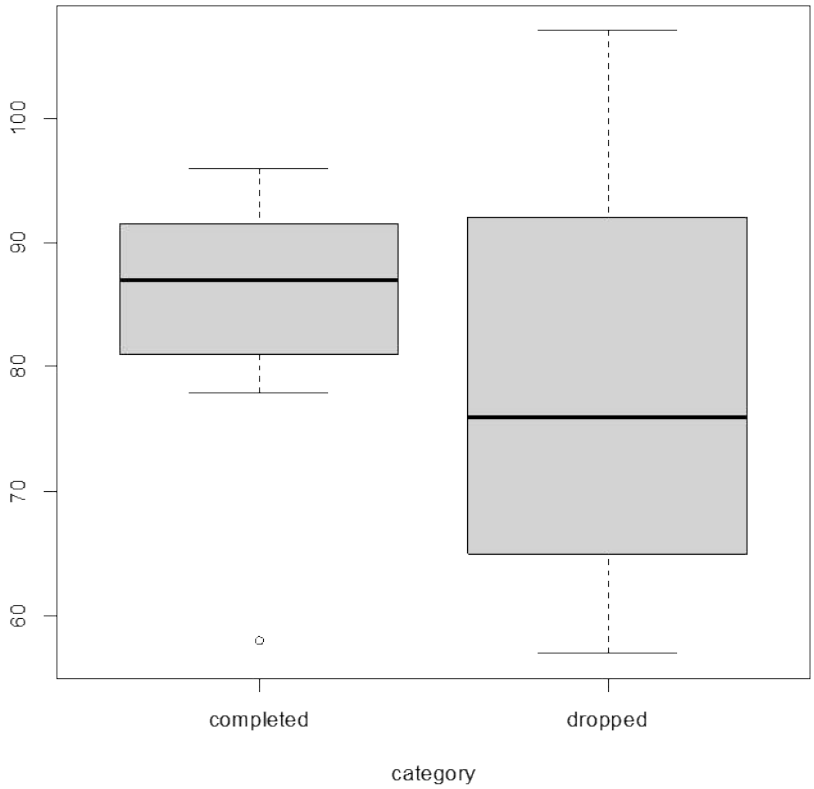
Reappraisal scores are higher in the completed group with less variability. This indicates that those who completed the study may use cognitive reappraisal more effectively or consistently to manage their emotions. Suppression scores are slightly higher in the completed group, but the difference is not substantial. Both groups exhibit similar variability in using suppression as an emotion regulation strategy. The total emotion regulation score is higher in the completed group, indicating overall better emotion regulation among those who completed the study. The lower variability suggests more consistency in emotion regulation strategies among completers. (Boxplot 6.)

Table 9: scores of coping skills and emotion regulation between the two groups

Measure	Items	Dropout (N=17)			Completed (N=11)		
		M 1	***SD***	***Measure***	***Items***	***M 2***	***SD***
CSES	Problem-Focused Coping	72.53	19.74	36-109	78.73	6.79	65-89
	Stopping	51.35	13.84	30-79	51.64	6.57	43-62
	Support From Others	31	7.61	14-44	32.64	8.55	12-40
	Overall Score	154.9	35.69	102-223	163	17.54	120-187
ERQ	Reappraisal	27.12	6.62	14-39	28.91	2.88	26-35
	Suppression	12.82	4.33	6-23	14.18	4.6	6-22
	Overall Score	78.65	35.69	57-107	85.09	10.8	58-96



Boxplot 5: variability of coping skill scale between the two groups



Boxplot 6: variability between emotion regulation capacities in both groups

Perceived social support:

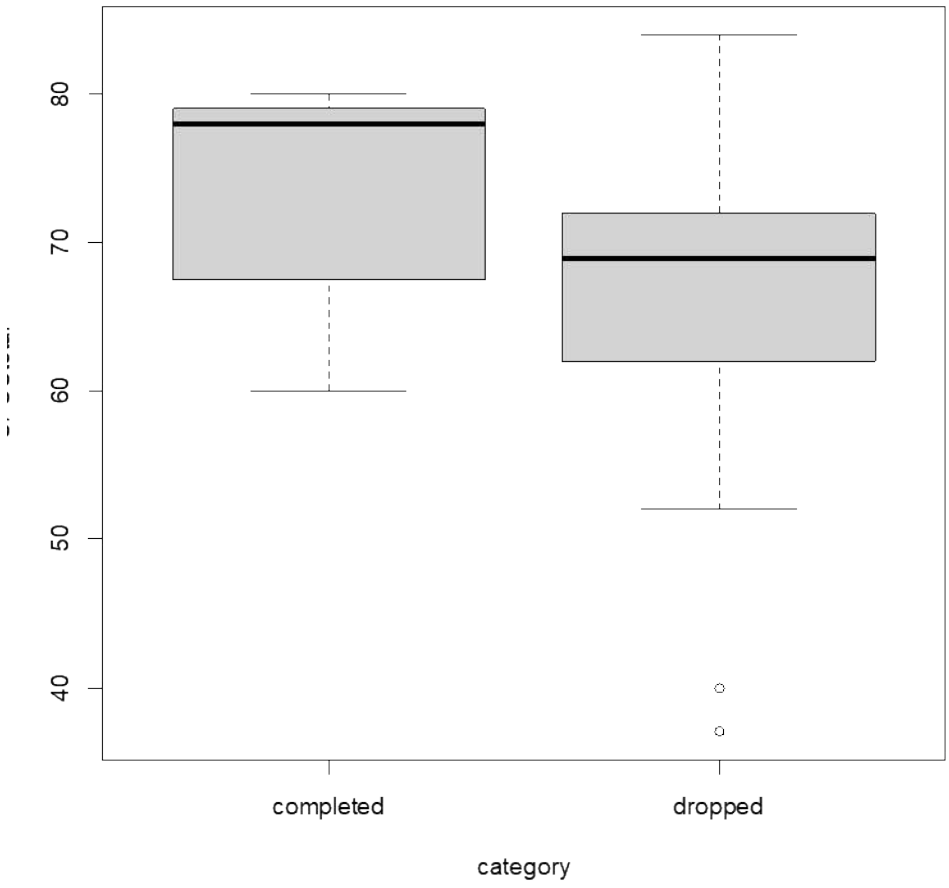
According to table 10., ssupport from a significant other is higher in the completed group with less variability. This suggests that those who completed the study feel more supported by their significant other. Support from family is slightly higher in the completed group, though the difference is not large. Both groups show similar variability in family support. Support from friends is higher and more consistent in the completed group. This indicates that those who completed the study have more robust support networks among friends. The total perceived social support score is higher in the completed group, indicating overall better perceived social support across all sources (significant other, family, and friends). The variability is also lower, suggesting more consistent social support among completers (boxplot 7.).

The analysis indicates that participants who completed the study generally perceive higher levels of social support from significant others, family, and friends compared to those who dropped out. The higher total MSPSS scores in the completed group suggest that strong and consistent social support may play a critical role in helping students persist in their studies. These findings emphasize the importance of fostering robust support networks for students to

potentially reduce dropout rates. Institutions may consider implementing support programs that encourage stronger connections with family, friends, and significant others to enhance students' overall perceived social support and improve retention.

Table 10: scores of perceived social supports between the two groups

Measure	Items	Dropout (N=17)			Completed (N=11)		
		M 1	***SD***	***Range***	***M 2***	***SD***	***Range***
MSPSS	Significant Other	22.35	6.62	8-28	25.09	2.91	18-28
	Family	21.47	6,07	4-28	23	6.13	11-28
	Friends	23.12	3.2	14-28	24.82	1.54	23-28
	Overall score	66.94	13.45	37-84	72.91	7.71	60-80



Boxplot 7: variability between perceived social support in both groups

6.4. The effect of the intervention: pre and post training scores.

Mental health and wellbeing

According to table 11., Anxiety and Depression scores show slight increases post-training, with a notable increase in variability (SD) and range, especially in Anxiety (from 2-10 to 0-17). This suggests that the training had diverse effects, with some participants experiencing increased anxiety and depression and others experiencing reductions. Stress shows a great increase in mean and Total scores show slight decreases in mean, with increases in variability and range, suggesting that while some individuals may have improved specially in reducing their stress levels, others might have worsened or shown more variability in their responses post-training. The marginal decrease in the mean total score and significant increase in variability indicate that while the overall combined symptoms of anxiety, depression, and stress improved slightly, the extent of improvement varied greatly among participants.

Regarding Perceived Stress scale, the mean score decreased from 23.00 to 19.82, indicating reduced stress levels post-training. The slight increase in SD, indicating a small increase in variability of stress levels among participants. The range narrowed suggests a more consistent reduction in stress levels, with fewer extreme high values.

The mean of MHC-SF remains relatively stable, increasing slightly. This suggests that, on average, the overall mental health of participants did not change significantly because of the training. The SD increased indicating that post-training, participants' mental health scores varied more widely than pre-training. This could suggest that while some participants' mental health improved, others may have experienced a decline. The increase in range, particularly the extension of the lower end, suggests that there were more extreme scores in the post-training assessment, with some participants reporting lower levels of mental health.

The mean score of Flourishing scale remained stable, increasing slightly. The SD increased significantly from 5.59 to 8.83, indicating more diverse experiences of flourishing post-training. The range widened, suggesting that while some participants experienced lower levels of flourishing, others reached higher levels post-training.

Table 11: Mental health scores pre and post

Scales	Subscales	T1			T2		
		Mean	***SD***	***Range***	***Mean***	***SD***	***Range***
DASS-21	Anxiety symptoms	5.55	2.5	2-10	6.45	5.65	0-17
	Depression Symptoms	6.45	4.89	1-16	6.55	5.65	1-16
	Stress symptoms	11	3.71	6-16	9.82	4.69	3-19
	Overall score	23.00	8.07	10-37	22.82	14.55	6-52
PSS		23.00	6.03	13-35	19.82	6.19	13-32
MHC-SF		42.00	9.78	22-54	42.18	11.79	19-56
FS		45.55	5.59	35-53	45.64	8.83	23-56

Coping skills and emotion regulation

According to table 12., all three subscales in coping scale show an increase in mean scores post-training, indicating improved coping abilities. Variability (SD) and range generally increase, suggesting diverse improvements among participants. The increase in the mean, indicates a substantial improvement in problem-focused coping abilities post-training. The mean score increased, showing enhanced ability to stop avoid undesired thoughts. The mean score increased, suggesting better utilization of support from others post-training. However, the increased variability and wider ranges indicate that participants' responses to the training were diverse, with some benefiting significantly more than others. The widening of ranges for all subscales and the total score reflects a broader spectrum of coping improvements among participants. This means that while some participants made small gains, others showed substantial progress, indicating diverse responses to the training.

In ERQ, the mean of reappraisal decreased, suggesting a decline in the use of cognitive reappraisal as an emotion regulation strategy post-training. The SD increased, indicating greater variability in how participants used reappraisal post-training. The range widened significantly from 26-35 to 15-33, showing a broader spectrum of reappraisal use post-training, with some participants reporting much lower use. Nonetheless, the mean score of suppression decreased, suggesting a significant reduction in the use of suppression as an emotion regulation

strategy post-training. The range narrowed, suggesting that while the mean decreased, the extreme values of suppression use were less pronounced post-training.

Table 12: Coping and ERQ scores pre and post training

Scales	Subscales	T1			T2		
		Mean	***SD***	**Range**	***Mean***	***SD***	**Range**
CSES	Problem-Focused	78.73	6.80	65-89	85.91	12.31	66-100
	Stopping	51.64	6.58	43-62	58.36	8.38	46-73
	Support From Others	32.64	8.56	12-40	35.91	8.07	17-47
	Overall score	163	17.55	120-187	180.18	22.97	151-212
ERQ	Reappraisal	28.91	2.84	26-35	27.18	4.85	15-33
	Suppression	14.18	4.6	6-22	11.82	4.73	4-18
	Overall score	43.09	10.8	58-96	39.00	8.04	19-46

Perceived social support.

According to table 13., regarding perceived social support, the mean score of receiving support from a significant other decreased, indicating that perceived support from a significant other declined post-training. The SD increased significantly from 2.91 to 7.67, suggesting more variability in perceived support levels. The range widened dramatically from 18-28 to 4-28, indicating that while some participants felt much less support, others maintained high levels of support. The mean of family support increased, indicating improved perceived support from family members post-training. The SD decreased from 6.13 to 3.96, suggesting more consistent perceptions of family support. The range narrowed, indicating that lower scores were less common post-training, and perceptions of support became more uniform. The mean of friend's support remained relatively stable. The SD increased, indicating more variability in perceived support from friends. The range narrowed slightly, suggesting a slight decrease in extreme low values. Although, the mean total score decreased slightly, The SD increased, suggesting more variability in overall social support perceptions and the range widened, indicating that while some participants perceived much less support, others maintained or improved their levels of support.

Table 13:Perceived social support scores pre and post training

Scales	Subscales	T1			T2		
		Mean	***SD***	***Range***	***Mean***	***SD***	***Range***
MSPSS	Significant Other	25.09	2.91	18-28	22.36	7.67	4-28
	Family	23	6.13	11-28	24.55	3.96	17-28
	Friends	24.82	1.54	23-28	24.73	2.53	21-28
	Overall score	72.91	7.71	60-80	71.64	11.02	53-84

Overall, the data suggest mixed results post-training. While coping abilities (CSES) and perceived stress (PSS) generally improve, indicating positive training effects, the increases in variability and range in several measures (especially DASS and MSPSS) suggest that the training's impact varies widely among participants. Some show significant improvement, while others may not benefit as much or could even experience worsened outcomes.

Chapter 7

Discussion

This study's main goal was to investigate if a stress management training via mobile application, could be useful to help international students manage stress. As a preliminary step of the study, we also aim at describing international students' stress levels as well as their mental health and coping skills.

Findings revealed that overall international students might benefit of a preventive intervention to help them deal with stress as, even if with a wide variability, reported levels of distress and mental health issue could also reach high levels.

The use of the app was very difficult to test as compliance was low. However, in the 11 international students that completed the training there was an overall improvement in coping strategies and wellbeing.

7.1 A picture of international students' stress levels and wellbeing

With the preliminary evaluation we were able to pinpoint important areas of concern and strengths. However, it is important to note that the wide variation among participants in most scales indicates that while some may not struggle others may be in distress, people's views of what constitutes stress and how they react to it vary greatly (Fink, 2016).

International students at the university of Padova reported moderate level of perceived stress and strongly correlated with the tension-stress scale in the DASS. Students reported higher scores in the stress sub-scale compared with the depression and anxiety ones, this is in line with previous studies in international students (Rafidah, Azizah, Norzaidi, Chong, Salwani, & Noraini, 2009). However, participants scored well in mental health, flourishing, emotion regulation, coping skills and perceived social support thus suggesting that stress appraisals can have a positive effect to some extent (Moskowitz et al., 2007).

As expected, higher level of stress was also associated with poorer wellbeing and greater mental health issues and lower flourishing capacities (Tsoory, Cohen, & Richter-Levin, 2007; Moore, Zoellner, & Mollenholt, 2008) also correlated to lower coping abilities, indicating that students with higher perceived stress levels tend to have poorer coping skills (García-León, Pérez-Mármol, Gonzalez-Pérez, del Carmen García-Ríos, & Peralta-Ramírez 2019). Our

results showed that international students use mainly active coping skills, which have been found to be associated with acculturative stress (Akthar & Herwig, 2015; Kosic, 2004; Mohammady et al., 2012; Noh, Beiser, Kasper, Hou, & Runmens, 1999). Compared to studies, participants expressed greater life dissatisfaction, or the majority stayed neutral, indicating that students who do not speak the language of the host country may have more challenges daily even when they are able to communicate in English in a university context (Masgoret, 2006; Selmer & Lauring, 2015; Yeh & Inose, 2003).

Regarding emotion regulation our results showed that most students regulate through reappraisal as opposed to suppression strategies. In other words, people don't always repress their emotions; instead, they actively seek strategies to control them. The results of our research primarily focused on females which can justify the lack of suppression (Misra et al., 2000; Verma et al., 2011; An Ra & Trusty, 2015; English et al., 2015; Mohammady et al., 2012; Sheikh et al., 2004; Taylor et al., 2004; Wei et al., 2008).

Students rely on a significant other or friends rather than family, this might show how, since the family is not present most of students find support in friends. This however might also be related to the age; most participants were young adults which might still prefer friends as family for support. proving that numerous forms of social support can assist lower stress (Maymon, & Hall, 2021; Amini, & Samani, 2021; Bozionelos, 2006). Most of the participants are from a collectivist country which might also influence the results of social support (Cipoletta et al., 2020). The correlation between social support and stress is not very substantial, according to our findings. Rather, there appears to be a mediated relationship between social support and stress mediated through coping skills this in line with Thomas & Choi, 2006; Lee, Koeske, & Sales, 2004; Ickes et al., 2015; Yeh & Inose 2003.

To conclude, moderately to elevate stress is associated with students' motivation to work more and study more to attain their goals which support the research of the significance of having a healthy mental state and thriving under pressure. The findings support the idea that stress can be beneficial since they demonstrate how students' life goals drive them to feel somewhat pressured, which in turn triggers a stress response to help them reach their objectives. For instance, a student whose goal in life is to become a doctor would be stressed before every exam because he needs to do well to graduate. However, if he has a high degree of flourishing and well-being, he will be able to handle stress in a way that will help him progress. Important impact from stress is improved education and personal development (Everly et al., 2002;

Lazarus & Folkman, 1984). Foreign students may so exhibit greater acculturative stress than academic stress, which suggests the application of problem-focused rather than passive coping.

7.2 Comparing characteristics of dropouts compared to completers.

When starting the long process of implementing the application we didn't expect to have to face such many dropouts, in general such intervention can have a 67% dropout (Hall, Brown, & Humphries, 2018; Wierzbicki and Pekarik 1993). One rational for such a low compliance might be that the majority of those who disregarded the instruction did never have a direct face to face interaction with the researcher face-to-face, this might suggest that when the support given by the in-person interaction is lacking compliance is lower (Buizza, Ghilardi, Olivetti, & Costa, 2019. This might also be due to the stress levels as previous studies have found that the dropout rate among students enrolled in online training programs was correlated to higher levels of stress (Zhao, Xiong, Zhang, & Qi, 2021; Lewis, & al., 2021).

To better understand what characterized students that decide to complete the training a differentiated them from those who didn't we computed several descriptive and qualitative comparisons.

As mentioned above we can't assess gender since we don't have enough males who participated however it is mentioned in different research that women tend to complete the training more compared to males due to gender norms that seeking help indicates weakness (Zhuzha, 2018; Herman, Poindexter, Witt, & Eisenberg, 2012; Mahalik et al., 2003), or maybe simply less men knew about the training compared to women.

According to our results, students from individualistic countries were the most likely to drop out as cultural similarities prevented acculturation stress from occurring particularly when dealing with more stressors (Skromanis et al., 2018, Yang et al., 2018). Students from collectivist eastern countries were more likely to complete fully the training, considering their nation's crisis and the lack of psychological resources already available to them (Cipoletta et al., 2020),

Our data revealed that students who experience social or financial hardships at home are more dedicated to and persistent in finishing the online training may be because it is provided for free. Conversely, individuals hailing from wealthier families might not experience the same

sense of drive to complete it. However, there is still cofounding results regarding SES and dropout rates (Lavine, 2019).

Students majoring in psychology had a higher dropout rate than students in other disciplines. This might be because psychology students find the information redundant because they are already familiar with the tools of stress management compared to someone being exposed to it for the first time and might be more interested to try it out more (Beutler, Rocco, Moleiro, & Talebi, 2001).

Our study found that students who are more in contact with their family and have a higher number of friends and engage in activities together the more they are more willing to complete the training. This is in line with previous studies in international students and social support in completing a training (Bender, van Osch, Sleegers, & Ye, 2019). However, it is important to note that the more a student is dissatisfied with the studies and life the more willing to complete it supporting the research (Cruwys, Ng., Haslam, & Haslam 2021).

Our results revealed that those who completed the training had higher depression and stress level compared to dropouts, but they are still in the moderate range which is in accordance with the studies discovering that mild symptoms participants are more likely to participate (Hall, Brown, & Humphries, 2018), also such result can seem to support the hypothesis (Baldwin, Berkeljon, Atkins, Olsen, & Nielsen, 2009) that lower levels of initial severity are associated with early dropout when a patient have adapted to the point where they believe no additional treatment is required.

The research revealed that students that took part in the intervention had higher scores regarding mental health, flourishing, emotion regulation, coping skills and perceived social support, indicating that internal motivation lead to greater completion (Gulliver, Griffiths, & Christensen, 2010; Quinn, Wilson, MacIntyre, & Tinklin, 2009). Also having a higher social support was important in terms of participation (Bender, van Osch, Sleegers, & Ye, 2019).

Although completers scored higher in all scales it is important to take into consideration other factors that lead to dropping out such as individual characteristics. ACT literature shows that the main reason of dropping out is related to time demands, intervention material and dropped communication and therapy setting and specific factors (e.g., non-time limited therapy, which was our case) (Karekla, Konstantinou, Ioannou, Kareklas, & Gloster, 2019;

Bados, Balaguer, & Saldaña, 2007; Roe, Dekel, Harel, & Fennig, 2006; Swift & Greenberg, 2012).

7.3. Assessment of the effectiveness of the training

Through the post survey, we were able to identify key areas of concern and strength of our training to measure our initial hypothesis. The primary objective of Acceptance and Commitment Therapy (ACT) is to support people in adopting behaviour's that minimize stress and enable them to achieve their desired outcomes. Nonetheless, it is important to highlight that supportive research conducted are for immigrants and asylum seekers and not for international students due to lack of finding in that last.

Our results revealed a decrease in stress but not anxiety or depression this is in line with Acarturk et al, 2022 research revealing that SH+ doesn't show improvement in reducing depressive symptoms. This reveal indicates that the training is effective in reducing acculturative stress but not academic stress or other mental distress.

Regarding other scales, there is no significant improvement in the overall mental health, flourishing, emotion regulation nor perceived social support which oppose the research of Karyotaki, & al. 2023, it is crucial to mention that the students in our research already scored high on those scales before conducting the training.

Participants had a major improvement in problem focused coping and stopping their negative thoughts which is one of the key aspects in the SH+, these findings support the research (A-tjak, Davis, Morina, Powers, Smits, & Emmelkamp, 2015; Fledderus, Bohlmeijer, Pieterse, & Schreurs 2012). SH+ helps participants to act in accordance with their values even in the face of challenging external circumstances, allowing them to respond more adaptively to changing situational demands. Through the application of mindfulness techniques, participants could develop the flexibility to manage adversity by learning to adapt challenging thoughts and feelings. This could aid in enhancing coping mechanisms especially active coping.

At the end of the post-survey participants provided insight on what could improve the application. Many expressed a need to have a transcript for the audios, it would make it easier to review the content and help individuals who are better readers than listeners. It was also suggested that users should be able to check the duration of the audio and accelerate its

playback, which would allow them to move through the content more quickly without having to pause the audio. There was also criticism directed towards the present mobile format; some participants had difficulty accurately registering progress and concerns with slow or boring voice transmission. The user experience would be considerably improved by addressing these issues by making improvements to the audio interface, however those improvements need to be discussed with the creators of the application since they don't have those features. Furthermore, adding more practical and real-world tasks to the training could improve its interest and usefulness.

Attendees provided insightful recommendations for further training sessions, highlighting the importance of customized and adaptable strategies. One suggestion was to hold the training sessions once a week, which would provide participants with a more manageable schedule. Further suggested enhancements included giving users the ability to accelerate the audio playback and improving the checklist function for more accurate progress monitoring. Additionally, participants indicated that they preferred textual content over audio recordings, and they suggested adding transcripts and more real-world examples to highlight important themes in future sessions. These adjustments would improve the training's overall efficacy and engagement while also accommodating a variety of learning styles.

In addition, participants provided a range of other ideas and remarks regarding the course, expressing gratitude as well as helpful criticism. Many praised the training's visual aids and straightforward language, finding it to be well-organized, practical, and easy to follow. A few individuals reported that the instruction inspired them and furnished practical resources for handling tension and feelings. Some, however, thought that despite the content's early repetition and simplicity, its effectiveness came from its adaptability and accessibility. Future enhancement suggestions included keeping flexible and accessible interventions available and adding components of incentive to assist start the day or week on a positive note. Overall, the feedback shows that although the training is successful, there is always room for improvement, especially about the way the content is delivered and how users interact with it.

Practical Implications

The empirical data acquired for this investigation supports the fundamental ideas of Self-Help+ being an effective to manage stress (Tol et al. 2020; Acarturk et al., 2022; Purgato et al., 2021; Carswell, Harper-Shehadeh, Watts, Van't Hof, Abi Ramia, Heim, Wenger, & van

Ommeren, 2018; Mediavilla et al., 2022; Abi Ramia et al., 2024). These findings serve as a starting point for developing interventions for international students that consider the acculturative stress more than the academic one and linking it to ACT.

The unexpected results suggest a need to reconsider the applicability of digitized intervention compared to face-to-face in Carlbring, Andersson, Cuijpers, Riper & Hedman-Lagerlöf, 2018 research. As well as adaptability in timing, contrary to the assumption of Amstadter, Broman-Fulks, Zinzow, Ruggiero, & Cercone, 2009; Eisenberg, Golberstein, & Gollust, 2007. However, having an e-coach or a known reference person might lead to better engagement even if the whole training was conducted online, this theory is supported by Johansson and Andersson, 2012; Newman et al., 2011; Richards and Richardson, 2012; Cuijpers, Donker, van Straten, Li, & Andersson, 2010; Spek et al., 2007; Gellatly et al., 2007.

Our results emphasize the necessity for easily navigable online resources that are tailored to better stress management encountered by overseas students, specially as their country are under hardship and they are expected to fully adapt to the new culture. We suggest in providing tools in different languages visually and auditory that accommodate the majority. Such application can be conducted by collaborating with diverse universities to provide more strategies as well as make it available to more students. The main goal is not to diagnose nor eliminate all mental disorders but to provide step by step instruments to better cope with distress.

Maybe by including a community forum in the online application, foreign students can interact, exchange stories, and look for guidance, creating a feeling of support and community therefore leading to less dropout rate. It is possible to create an information section where they are given easy, fast responses to situations that contribute to acculturative stress such as visa requirements and financial aid options.

7.4. Limitations of the Study

We have encountered various limitations in our research, mainly a limited sample size that limited our capacity to draw generalizations and measure its effectiveness from our findings and prevented us from making broad judgments and rely mainly on qualitative descriptive statistics; Lack of communication on the training—which was limited to psychology students mainly—is the primary cause of the small sample size.

Second, the lack of a follow-up study made it impossible to evaluate the web application's sustainability and long-term impacts, because there was no deadline for participants to complete the training and the results needed to be analyzed before presenting this research, it was impossible to assess a post-survey in such a tight interval.

Third, the study encountered methodological issues, such as the inability to compare the online application to in-person processes leading to absence of randomized control trial. As a result, it was challenging to ascertain whether the benefits observed were specific to the online application or if they applied to other approaches as well.

Fourth, we are aware that using participant self-reported data may induce response biases, due to the possibility that participants inflated or underestimated their experiences. As well as, the accuracy of the responses may have been compromised by language limitations, as some participants may have had difficulty understanding and expressing themselves.

7.5. Strengths Of the Study and Future Directions

By proving the viability of a stand-alone, application-based intervention that tackles typical obstacles to psychological health services for international students, such as time, cost, and accessibility, this research makes a unique contribution in promoting distress management tools. To proactively promote foreign students' value-based relationships and help them better cope their new country journey, the study provides insightful information about how the intervention might be incorporated into college orientation processes.

Despite some hypotheses not being fully supported or statistically significant the creation of such training is evident in contributing mental health service to higher number of international students that aren’t in high distress and in need of immediate psychological intervention.

The present investigation has uncovered multiple gaps in the existing literature, specifically with the sample size and follow-up survey. Future studies ought to examine the long-term impacts of utilizing an application that is free of charge on stress management for overseas students that is modeled after ACT, to better track better the students’ outcomes and have a deeper insight on the longevity. A more comprehensive and reliable picture of user experiences might be obtained by using a mixed-methods approach that incorporates both quantitative

surveys and qualitative interviews, which could be achieved by expanding the target audience and enlisting more participants.

Further research on the effects of cultural origins and the role of perceived social support on the usability and efficacy of online apps would be helpful. Also, taking into consideration the feedback of participants regarding adjusting audios features, creating a checklist, having a fixed schedule is essential for a better engagement in the training.

In conclusion, this study has shown how an easily navigable, free application may greatly enhance the foreign student stress management strategies. In addition, the results showed that, although reported levels of discomfort and mental health issues could vary widely, overall, international students might benefit from a preventive intervention to help them manage stress.

This study serves as a first step in developing a workable and scalable free strategy application for the mental health of all foreign students, particularly at the University of Padua, which may ultimately be embraced by educational institutions around the world.

This study has started to show how crucial it is to provide an ongoing feedback and adapted intervention while creating instructional materials for international students, and it provided pilot strategies to enhance the effectiveness of the tool. Because our research focuses on the difficulties experienced by international students, it has personally strengthened my trust in the use of technology to remove barriers and build more inclusive interventions.

References

Abbott, D. H., Keverne, E. B., Bercovitch, F. B., Shively, C. A., Mendoza, S. P., Saltzman, W., ... & Sapolsky, R. M. (2003). Are subordinates always stressed? A comparative analysis of rank differences in cortisol levels among primates. Hormones and behavior, 43(1), 67-82.

Abi Ramia, J., Abi Hana, R., Noun, P., Cuijpers, P., Carswell, K., Van't Hof, E., Heim, E., Zoghbi, E., Sijbrandij, M., & El Chammay, R. (2024). Feasibility and uptake of a digital mental health intervention for depression among Lebanese and Syrian displaced people in Lebanon: a qualitative study. *Frontiers in public health*, *11*, 1293187. https://doi.org/10.3389/fpubh.2023.1293187

Acarturk C, Uygun E, Ilkkursun Z, Carswell K, Tedeschi F, Batu M, Eskici S, Kurt G, Anttila M, Au T, Baumgartner J, Churchill R, Cuijpers P, Becker T, Koesters M, Lantta T, Nosè M, Ostuzzi G, Popa M, Purgato M, Sijbrandij M, Turrini G, Välimäki M, Walker L, Wancata J, Zanini E, White RG, van Ommeren M, Barbui C. Effectiveness of a WHO self-help psychological intervention for preventing mental disorders among Syrian refugees in Turkey: a randomized controlled trial. World Psychiatry. 2022 Feb;21(1):88-95. doi: 10.1002/wps.20939. PMID: 35015365; PMCID: PMC8751562.

Ahmed Khan, M., et al. (2017). Assessment of stress level among university students and local population. http://dx.doi.org/10.20959/wjpr201714-9970

Aikawa, M., & Kleyman, K. (2021). Immigration, coping, and well-being: Implications for communities' roles in promoting the well-being of immigrants and refugees. *Journal of Prevention & Intervention in the Community*, *49*(1), 81-92.

Akshay Misra, Ashley Bryan, Naomi S. Faber, Destiny Printz Pereira, Sonya Faber, Monnica T. Williams, Matthew D. Skinta, A systematic review of inclusion of minoritized populations in randomized controlled trials of acceptance and commitment therapy, Journal of Contextual Behavioral Science, Volume 29, 2023, Pages 122-130, ISSN 2212-1447, https://doi.org/10.1016/j.jcbs.2023.05.008.

Alemi Q, James S, Cruz R, Zepeda V, Racadio M. Psychological distress in afghan refugees:a mixed-method systematic review. J Immigr Minor Health. 2014 Dec;16(6):1247-61. doi:10.1007/s10903-013-9861-1. PMID: 23784146; PMCID: PMC3912229.

Ali, A. M., Alkhamees, A. A., Hori, H., Kim, Y., & Kunugi, H. (2021). The Depression Anxiety Stress Scale 21: Development and Validation of the Depression Anxiety Stress Scale 8-Item in Psychiatric Patients and the General Public for Easier Mental Health Measurement in a Post COVID-19 World. *International journal of environmental research and public health*, *18*(19), 10142. https://doi.org/10.3390/ijerph181910142

Amanvermez, Y., et al. (2023). Sources of stress among domestic and international students: a cross-sectional study of university students in Amsterdam, The Netherlands. https://doi.org/10.1080/10615806.2023.2280701

Amin, A., Van Assche, J., Abdelrahman, M., McCashin, D., Al-Adwan, D., & Hasan, Y. (2022). Can identity buffer against the detrimental effects of threat? The case of the Qatarblockade. Frontiers in Psychology, 13, Article 750471.https://doi.org/10.3389/fpsyg.2022.750471

Amini, S., & Samani, S. (2021). Causal modeling of student social support, academic skills and academic self-efficacy. *Biannual Journal of Applied Counseling*, *11*(1), 1-20.

Amstadter, A. B., Broman-Fulks, J., Zinzow, H., Ruggiero, K. J., & Cercone, J. (2009). Internet-based interventions for traumatic stress-related mental health problems: a review and suggestion for future research. *Clinical psychology review*, *29*(5), 410-420.

Andersson, G., & Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: a meta-analysis. *Cognitive behaviour therapy*, *38*(4), 196-205.

Arrow, K., Resnik, P., Michel, H., Kitchen, C., Mo, C., Chen, S., Espy-Wilson, C., Coppersmith, G., Frazier, C., & Kelly, D. L. (2023). Evaluating the Use of Online Self-Report Questionnaires as Clinically Valid Mental Health Monitoring Tools in the Clinical Whitespace. *The Psychiatric quarterly*, *94*(2), 221–231. https://doi.org/10.1007/s11126-023-10022-1

A-tjak, J. G., Davis, M. L., Morina, N., Powers, M. B., Smits, J. A., & Emmelkamp, P. M. (2015). A meta-analysis of the efficacy of acceptance and commitment therapy for clinically relevant mental and physical health problems. *Psychotherapy and Psychosomatics*, *84*(1), 30-36.

B. Sue Graves et al. Gender differences in perceived stress and coping among college students, 2021. https://doi.org/10.1371/journal.pone.0255634

Bados, A., Balaguer, G., & Saldaña, C. (2007). The efficacy of cognitive–behavioral therapy and the problem of drop-out. Journal of Clinical Psychology, 63, 585-592. https://doi.org/10.1002/jclp.20368

Balci S, Küchler AM, Ebert DD, Baumeister H. An Online Mindfulness Intervention for International Students: A Randomized Controlled Feasibility Trial. Clin Psychol Eur. 2023 Jun 29;5(2): e9341. doi: 10.32872/cpe.9341. PMID: 37732147; PMCID: PMC10508251.

Baldwin, S. A., Berkeljon, A., Atkins, D. C., Olsen, J. A., & Nielsen, S. L. (2009). Rates of change in naturalistic psychotherapy: Contrasting dose-effect and good-enough level models of change. Journal of Consulting and Clinical Psychology, 77, 203–211. doi:10:1037/a0015235

Barbayannis G. et al. Academic Stress and Mental Well-Being in College Students: Correlations, Affected Groups, and COVID-19 (2022); doi: 10.3389/fpsyg.2022.886344.

Barbui C et al (2022). Preventing the mental health consequences of war in refugee populations. Epidemiology and Psychiatric Sciences 31, e24, 1–3. https://doi.org/10.1017/S2045796022000154

Barnett et al., The efficacy of psychological interventions for the prevention and treatment of mental health disorders in university students: A systematic review and meta-analysis 2021; https://doi.org/10.1016/j.jad.2020.10.060

Barnett, P., Arundell, L. L., Saunders, R., Matthews, H., & Pilling, S. (2021). The efficacy of psychological interventions for the prevention and treatment of mental health disorders in university students: a systematic review and meta-analysis. *Journal of affective disorders*, *280*, 381-406.

Barrett LF, Simmons WK. Interoceptive predictions in the brain. Nat Rev Neurosci. 2015 Jul;16(7):419-29. doi: 10.1038/nrn3950. Epub 2015 May 28. PMID: 26016744; PMCID: PMC4731102.

Bender, M., van Osch, Y., Sleegers, W., & Ye, M. (2019). Social support benefits psychological adjustment of international students: Evidence from a meta-analysis. *Journal of Cross-Cultural Psychology*, *50*(7), 827-847.

Bernal, G., Jiménez-Chafey, M. I., & Domenech Rodríguez, M. M. (2009). Cultural adaptation of treatments: A resource for considering culture in evidence-based practice. *Professional Psychology: Research and Practice*, *40*(4), 361.

Berry, J. W. (2005). Acculturation: Living successfully in two cultures. International Journal of Intercultural Relations, 29(6), 697-712. ISSN 0147-1767.

Berry, J. W., & Annis, R. C. (1974). Acculturative Stress: The Role of Ecology, Culture and Differentiation. Journal of Cross-Cultural Psychology, 5(4), 382-406. https://doi.org/10.1177/002202217400500402

Beutler, L. E., Rocco, F., Moleiro, C. M., & Talebi, H. (2001). Resistance. *Psychotherapy: Theory, Research, Practice, Training*, *38*(4), 431.

Biglan, A., Hayes, S. C., & Pistorello, J. (2008). Acceptance and commitment: Implications for prevention science. *Prevention science*, *9*, 139-152.

Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S. M., & Olfson, M. (2008). Mental health of college students and their non–college-attending peers: results from the national epidemiologic study on alcohol and related conditions. *Archives of general psychiatry*, *65*(12), 1429-1437.

Boone, M. S., & Canicci, J. (2013). Acceptance and commitment therapy (ACT) in groups.

Bos, F. M., Snippe, E., Bruggeman, R., Doornbos, B., Wichers, M., & van der Krieke, L. (2020). Recommendations for the use of long-term experience sampling in bipolar disorder care: a qualitative study of patient and clinician experiences. *International Journal of Bipolar Disorders*, *8*, 1-14.

Bos, F. M., von Klipstein, L., Emerencia, A. C., Veermans, E., Verhage, T., Snippe, E., Doornbos, B., Hadders-Prins, G., Wichers, M., & Riese, H. (2022). A Web-Based Application for Personalized Ecological Momentary Assessment in Psychiatric Care: User-Centered Development of the PETRA Application. *JMIR mental health*, *9*(8), e36430. https://doi.org/10.2196/36430

Brandolin, F., Lappalainen, P., Gorinelli, S., Muotka, J., & Lappalainen, R. (2023). Examining the effectiveness and acceptability of a group-based ACT intervention delivered by

videoconference to international university students during the COVID-19 pandemic. Counselling Psychology Quarterly, Early online. https://doi.org/10.1080/09515070.2023.2254726

Breedlove, D. Crews, & M. M. McCarthy (Eds.), Behavioral endocrinology (2nd ed., pp.409–450). MIT Press.

Broadbent, D. E. (1982). Task combination and selective intake of information. ActaPsychologica, 50(3), 253-290. https://doi.org/10.1016/0001-6918(82)90043-9

Brosschot JF, Verkuil B, Thayer JF. Generalized unsafety theory of stress: unsafe environments and conditions, and the default stress response. Int J Environ Res Public Health. 2018; 15:464.

Brosschot JF. Ever at the ready for that never happen. Eur J Psychotraumatol.2017; 8:1309934.

Brown, S. B., Brosschot, J. F., Versluis, A., Thayer, J. F., & Verkuil, B. (2020). Assessing new methods to optimally detect episodes of non-metabolic heart rate variability reduction as an indicator of psychological stress in everyday life: A thorough evaluation of six methods. Frontiers in neuroscience, 14, 564123.

Buizza, C., Ghilardi, A., Olivetti, E., & Costa, A. (2019). Dropouts from a university counselling service: a quantitative and qualitative study. *British Journal of Guidance & Counselling*, *47*(5), 590-602.

Byrd-Craven, J., Calvi, J.L. & Kennison, S.M. Rapid Cortisol and Testosterone Responses to Sex-Linked Stressors: Implications for the Tend-and-Befriend Hypothesis. Evolutionary Psychological Science 2, 199–206 (2016). https://doi.org/10.1007/s40806-016-0053-9.

Cannon, W.B. (1935). STRESSES AND STRAINS OF HOMEOSTASIS. The American Journal of the Medical Sciences, 189, 13–14.

Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. *Cognitive behaviour therapy*, *47*(1), 1-18.

Carlbring, P., Nordgren, L. B., Furmark, T., & Andersson, G. (2009). Long-term outcome of internet-delivered cognitive–behavioural therapy for social phobia: A 30-month follow-up. *Behaviour research and therapy*, *47*(10), 848-850.

Carolyn Gotay et al., Cancer risk: Prevention is crucial. Science347,728- 728(2015). DOI:10.1126/science.aaa6462

Carswell, K., Harper-Shehadeh, M., Watts, S., Van't Hof, E., Abi Ramia, J., Heim, E., Wenger, A., & van Ommeren, M. (2018). Step-by-Step: a new WHO digital mental health intervention for depression. *mHealth*, *4*, 34. https://doi.org/10.21037/mhealth.2018.08.01

Castellanos, R., Yildiz Spinel, M., Phan, V., Orengo-Aguayo, R., Humphreys, K. L., & Flory, K. (2020). A systematic review and meta-analysis of cultural adaptations of mindfulness-based interventions for Hispanic populations. *Mindfulness*, *11*, 317-332.

Chase, J. A. (2010). *The additive effects of values clarification training to an online goal-setting procedure on measures of student retention and performance*. University of Nevada, Reno.

Chase, J. A., Houmanfar, R., Hayes, S. C., Ward, T. A., Vilardaga, J. P., & Follette, V. (2013). Values are not just goals: Online ACT-based values training adds to goal setting in improving undergraduate college student performance. *Journal of Contextual Behavioral Science*, *2*(3-4), 79-84.

Chen, Z., Zhang, M., Li, Y., Huang, Z., & Wang, L. (2017). Co-prevalence of chronic disease risk factors and influencing factors

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British journal of health psychology*, *11*(Pt 3), 421–437. https://doi.org/10.1348/135910705X53155

Chirkov, V., Vansteenkiste, M., Tao, R., & Lynch, M. (2007). The role of self-determined motivation and goals for study abroad in the adaptation of international students. *International Journal of Intercultural Relations*, *31*(2), 199-222.

Christensen, H., Griffiths, K. M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression: systematic review. *Journal of medical Internet research*, *11*(2), e1194.

Christodoulou, V., Flaxman, P. E., & Lloyd, J. (2021). Acceptance and commitment therapy in group format for college students. Journal of College Counseling, 24(3), 210–223.

Cipolette, S., et al. (2022). Perceived social support and well-being of international students at an Italian University. DOI:10.32674/jis. v12i3.3954

Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J. S. L., & Thornicroft, G. (2015). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. Psychological Medicine, 45(1), 11–27. 10.1017/S0033291714000129

Cohen, S., & Williamson, G. (1988). Perceived Stress in a Probability Sample of the United States. In S. Spacapan & S. Oskamp (Eds.), The Social Psychology of Health (pp. XX-XX). Newbury Park, CA: Sage.

Cohen, S., & Williamson, G. M. (1991). Stress and infectious disease in humans. Psychological bulletin, 109(1), 5.

Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. Jama, 298(14), 1685-1687.

Cole, D. A., Nolen-Hoeksema, S., Girgus, J., & Paul, G. (2006). Stress exposure and stress generation in child and adolescent depression: a latent trait-state-error approach to longitudinal analyses. Journal of abnormal psychology, 115(1), 40.

Connor, K. M., Vaishnavi, S., Davidson, J. R., Sheehan, D. V., & Sheehan, K. H. (2007). Perceived stress in anxiety disorders and the general population: A study of the Sheehan stress vulnerability scale. Psychiatry research, 151(3), 249-254.

Craske, M. G. (2012). Transdiagnostic treatment for anxiety and depression. *Depression and anxiety*.

Creel, S. (2022). A retrospective view of early research on dominance, stress and reproduction in cooperatively breeding carnivores. Hormones and Behavior, 140, 105119.

Cristaldi, F., & Morri, R. (2015). Vecchie e nuove emigrazioni: Il Lazio fuori dal Lazio. Edizioni Nuova Cultura.

Croom, K., Staiano-Coico, L., Lesser, M. L., Lewis, D. K., Reyna, V. F., Marchell, T. C., ... & Ives, S. (2015). The glass is half full: Evidence for efficacy of alcohol-wise at one university but not the other. *Journal of health communication*, *20*(6), 627-638.

Cruwys, T., Ng, N. W., Haslam, S. A., & Haslam, C. (2021). Identity continuity protects academic performance, retention, and life satisfaction among international students. *Applied Psychology*, *70*(3), 931-954.

Cuijpers, P., Donker, T., van Straten, A., Li, J., & Andersson, G. (2010). Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A systematic review and meta-analysis of comparative outcome studies. *Psychological medicine*, *40*(12), 1943-1957.

Cutuli, D. (2014). Cognitive reappraisal and expressive suppression strategy's role in the emotion regulation: An overview on their modulatory effects and neural correlates. Frontiers in Systems Neuroscience, 8, Article 175.

Danitz, S. B., & Orsillo, S. M. (2014). The Mindful Way Through the Semester: An Investigation of the Effectiveness of an Acceptance-Based Behavioral Therapy Program on Psychological Wellness in First-Year Students. Behavior Modification, 38(4), 549-566. https://doi.org/10.1177/0145445513520218

De La Fuente J. et al. Effects of Levels of Self-Regulation and Regulatory Teaching on Strategies for Coping With Academic Stress in Undergraduate Students (2020); https://doi.org/10.3389/fpsyg.2020.00022.

DE VECCHIS, G. (2015). Parchi e Aree Naturali: l'educazione come strumento per superare la conflittualità tra ambiente e sviluppo del territorio. In Annuario dei dati ambientali 2014-2015 (pp. 32-36). ISPRA.

Delahanty, D. L., Nugent, N. R., Christopher, N. C., & Walsh, M. (2005). Initial urinary epinephrine and cortisol levels predict acute PTSD symptoms in child trauma victims. Psychoneuroendocrinology, 30(2), 121-128. https://doi.org/10.1016/j.psyneuen.2004.06.004.

Delahanty, D. L., Raimonde, A. J., Spoonster, E., & Cullado, M. (2003). Injury severity, prior trauma history, urinary cortisol levels, and acute PTSD in motor vehicle accident victims. Journal of Anxiety Disorders, 17(2), 149-164. https://doi.org/10.1016/S0887-6185(02)00185-8.

Den Boer, P. C., Wiersma, D., & van den Bosch, R. J. (2004). Why is self-help neglected in the treatment of emotional disorders? A meta-analysis. *Psychological medicine*, *34*(6), 959-971.

DeSteno D, Gross JJ, Kubzansky L. Affective science and health: the importance of emotion and emotion regulation. Health Psychol. 2013 May;32(5):474-86. doi: 10.1037/a0030259. PMID: 23646831.

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social indicators research*, *97*, 143-156.

Du H, Li X. Acculturation and HIV-related sexual behaviours among international migrants: a systematic review and meta-analysis. Health Psychol Rev. 2015;9(1):103-22. Doi: 10.1080/17437199.2013.840952. Epub 2013 Oct 10. PMID: 25793493; PMCID: PMC4368855.

Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: Depressive symptoms, stress, and coping. Journal of clinical psychology, 62(10), 1231-1244.

Eid, M., & Larsen, R. J. (Eds.). (2008). *The science of subjective well-being*. Guilford Press.

Eisenberg, D., Golberstein, E., & Gollust, S. E. (2007). Help-seeking and access to mental health care in a university student population. *Medical care*, 594-601.

Eisler, R.T., & Levine, D.S. (2002). Nurture, Nature, and Caring: We Are Not Prisoners of Our Genes. Brain and Mind, 3, 9-52.

Eisma, M. C., et al. (2023). Cognitive reappraisal, emotional expression and mindfulness in adaptation to bereavement: a longitudinal study. https://doi.org/10.1080/10615806.2023.2165647

Enkhtaivan, B., Brusa, J., & Davaadorj, Z. (2020). A gap in brain gain for emerging countries: Evidence of international immigration on non-resident patents. Journal of Risk and Financial Management, 14(1), 7.

Epel, E. S., Crosswell, A. D., Mayer, S. E., Prather, A. A., Slavich, G. M., Puterman, E., & Mendes, W. B. (2018). More than a feeling: A unified view of stress measurement for population science. Frontiers in neuroendocrinology, 49, 146-169.10.1038/oby.2010.241. Epub 2010 Oct 14. Erratum in: Obesity (Silver Spring). 2011 Jun;19(6):1315. PMID: 20948519.

Epping-Jordan, J. E., Harris, R., Brown, F. L., Carswell, K., Foley, C., García-Moreno, C., Kogan, C., & van Ommeren, M. (2016). Self-Help Plus (SH+): a new WHO stress management package. *World psychiatry : official journal of the World Psychiatric Association (WPA)*, *15*(3), 295–296. https://doi.org/10.1002/wps.20355

Farah, D. R., & Choi, H. (2019). Associations of acculturative stress, depression, and quality of life among Indonesian migrant workers in South Korea. Journal of Korean Academy of Psychiatric and Mental Health Nursing, 28(2), 172-180. https://doi.org/10.12934/jkpmhn.2019.28.2.172

Farrer, L., Gulliver, A., Chan, J. K., Batterham, P. J., Reynolds, J., Calear, A., ... & Griffiths, K. M. (2013). Technology-based interventions for mental health in tertiary students: systematic review. *Journal of medical Internet research*, *15*(5), e2639.

Ferrario, C. (2023). Finding Common Ground: International Students in UPO and their Academic Experiences. DOI:10.4458/5970-07

Fledderus, M., Bohlmeijer, E. T., Pieterse, M. E., & Schreurs, K. M. G. (2012). Acceptance and commitment therapy as guided self-help for psychological distress and positive mental health: a randomized controlled trial. *Psychological medicine*, *42*(3), 485-495.

Flynn, M. (2021, November 11). Immigration and stress. DOI: 10.1007/978-3-658-27789-5_36

Folkersma, W., Veerman, V., Ornée, D. A., Oldehinkel, A. J., Alma, M. A., & Bastiaansen, J. A. (2021). Patients' experience of an ecological momentary intervention involving self-monitoring and personalized feedback for depression. *Internet Interventions*, *26*, 100436.

Folkman S, Lazarus RS. If it changes it must be a process: study of emotion and coping during three stages of a college examination. J Pers Soc Psychol. 1985 Jan;48(1):150-70. Doi: 10.1037//0022-3514.48.1.150. PMID: 2980281.

Ford, J. D. (2015). Social, cultural, and other diversity issues in the traumatic stress field. https://doi.org/10.1016%2FB978-0-12-801288-8.00011-X

Francesca Brandolin, Päivi Lappalainen, Simone Gorinelli, Joona Muotka & Raimo Lappalainen (2023) Examining the effectiveness and acceptability of a group-based ACT intervention delivered by videoconference to international university students during the COVID-19 pandemic, Counselling Psychology Quarterly, DOI: 10.1080/09515070.2023.2254726

Francesca Brandolin, Päivi Lappalainen, Simone Gorinelli, Joona Muotka, Panajiota Räsänen & Raimo Lappalainen (2023) The effectiveness of a five-session workshop on the distress of international students in Finland – a pilot study, British Journal of Guidance & Counselling, 51:6, 865-882, DOI: 10.1080/03069885.2023.2165636

Fries, P. (2005). A mechanism for cognitive dynamics: neuronal communication through neuronal coherence. Trends in cognitive sciences, 9(10), 474-480.

Frumkin, M. R., Piccirillo, M. L., Beck, E. D., Grossman, J. T., & Rodebaugh, T. L. (2021). Feasibility and utility of idiographic models in the clinic: a pilot study. *Psychotherapy Research*, *31*(4), 520-534.

Fuchs, C., Lee, J. K., Roemer, L., & Orsillo, S. M. (2013). Using mindfulness-and acceptance-based treatments with clients from nondominant cultural and/or marginalized backgrounds: Clinical considerations, meta-analysis findings, and introduction to the special series: Clinical considerations in using acceptance-and mindfulness-based treatments with diverse populations. *Cognitive and behavioral practice*, *20*(1), 1-12.

Gallagher, R. P. (2014). National survey of college counseling centers 2013, section one: 4-year directors.

Ganz JB, Earles-Vollrath TL, Heath AK, Parker RI, Rispoli MJ, Duran JB. A meta-analysis of single case research studies on aided augmentative and alternative communication systems with individuals with autism spectrum disorders. J Autism Dev Disord. 2012 Jan;42(1):60-74. doi: 10.1007/s10803-011-1212-2. PMID: 21380612.

Ganz, F. D. (2012). Tend and befriend in the intensive care unit. Critical care nurse, 32(3), 25-34.

Gao, W., Gong, M., & Wang, L. (1988). Comparative analysis of bibliotherapy for mental problems in college students. *Chinese Mental Health Journal*.

García-León, M. Á., Pérez-Mármol, J. M., Gonzalez-Pérez, R., del Carmen García-Ríos, M., & Peralta-Ramírez, M. I. (2019). Relationship between resilience and stress: Perceived stress, stressful life events, HPA axis response during a stressful task and hair cortisol. *Physiology & behavior*, *202*, 87-93.

Garfinkel, S. N., & Critchley, H. D. (2016). Threat and the body: how the heart supports fear processing. Trends in cognitive sciences, 20(1), 34-46.

Gellatly, J., Bower, P., Hennessy, S. U. E., Richards, D., Gilbody, S., & Lovell, K. (2007). What makes self-help interventions effective in the management of depressive symptoms? Meta-analysis and meta-regression. *Psychological medicine*, *37*(9), 1217-1228.

Gill, Amarjit. (2011). The effects of capital structure on profitability: Evidence from UnitedStates. International Journal of Management. 28. 3-15.

Glass, C., & Cruz, N. (2022). Moving towards multipolarity: shifts in the core-periphery structure of international student mobility and world rankings (2000–2019). Volume 85, pages 415–435, (2023).

Greenaway, K. H., Haslam, S. A., Cruwys, T., Branscombe, N. R., Ysseldyk, R., & Heldreth, C. (2015). From "we" to "me": Group identification enhances perceived personal control with consequences for health and well-being. Journal of personality and social psychology, 109(1), 53.

Gregory D. Zimet , Nancy W. Dahlem , Sara G. Zimet & Gordon K. Farley (1988) The Multidimensional Scale of Perceived Social Support, Journal of Personality Assessment, 52:1, 30-41, DOI: 10.1207/s15327752jpa5201_2

Gregory, R. J., Schwer Canning, S., Lee, T. W., & Wise, J. C. (2004). Cognitive bibliotherapy for depression: A Meta-Analysis. *Professional Psychology: Research and Practice*, *35*(3), 275.

Grist, R., & Cavanagh, K. (2013). Computerised cognitive behavioural therapy for common mental health disorders, what works, for whom under what circumstances? A systematic review and meta-analysis. *Journal of Contemporary Psychotherapy*, *43*, 243-251.

Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. Journal of Personality and Social Psychology, 85, 348-362.

Guardino CM, Schetter CD. Coping during pregnancy: a systematic review and recommendations. Health Psychol Rev. 2014;8(1):70-94. doi:10.1080/17437199.2012.752659. Epub 2014 Jan 8. PMID: 24489596; PMCID: PMC3904449.

Gulliver, A., Griffiths, K.M., Christensen, H., 2010. Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. BMC Psychiatry 10(1), 113.

GURUNG, R.A.R., SARASON, B.R. and SARASON, I.G. (1997), Personal characteristics, relationship quality, and social support perceptions and behavior in young adult romantic relationships. Personal Relationships, 4: 319-339. https://doi.org/10.1111/j.1475-6811.1997.tb00149.x

Hall, M., Musick, K., & Yi, Y. (2019). Living Arrangements and Household Complexity among Undocumented Immigrants. Population and Development Review, 45(1), 81–101. http://www.jstor.org/stable/45174477

Hall, S. B., Brown, N. W., & Humphries, J. R. (2018). Premature termination from outpatient psychotherapy in a university-based counseling center. *Counseling outcome research and evaluation*, *9*(1), 28-41.

Hawkley, L. C., Thisted, R. A., Masi, C. M., & Cacioppo, J. T. (2010). Loneliness predicts increased blood pressure: 5-year cross-lagged analyses in middle-aged and older adults.Psychology and Aging, 25(1), 132–141. https://doi.org/10.1037/a0017805

Hayes S. C., Luoma J., Bond F., Masuda A., Lillis J. (2006). Acceptance and Commitment Therapy: Model, processes, and outcomes. *Behaviour Research and Therapy*, 44, 1-25

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy* (Vol. 6). New York: Guilford press.

Hazelkorn, E. (2012). European “transparency instruments”: Driving the modernisation of European higher education. European Higher Education at the crossroads: between the Bologna Process and national reforms, 339-360.

Herman, P. M., Poindexter, B. L., Witt, C. M., & Eisenberg, D. M. (2012). Are complementary therapies and integrative care cost-effective? A systematic review of economic evaluations. *BMJ open*, *2*(5), e001046.

Hetrick, S. E., Goodall, J., Yuen, H. P., Davey, C. G., Parker, A. G., Robinson, J., ... & Simmons, M. B. (2016). Comprehensive online self-monitoring to support clinicians manage risk of suicide in youth depression. *Crisis*.

Howell, A.J., Passmore, HA. Acceptance and Commitment Training (ACT) as a Positive Psychological Intervention: A Systematic Review and Initial Meta-analysis Regarding ACT’s Role in Well-Being Promotion Among University Students. *J Happiness Stud* **20**, 1995–2010 (2019). https://doi.org/10.1007/s10902-018-0027-7

https://www.qualtrics.com/about/

https://www.who.int/news/item/11-10-2021-new-stress-management-course-for-people-living-with-adversity

Hutcherson CA, Seppala EM, Gross JJ. Loving-kindness meditation increases social connectedness. Emotion. 2008 Oct;8(5):720-4. doi: 10.1037/a0013237. PMID: 18837623.

Jack A. Haeger , Carter H. Davis & Michael E. Levin (2022) Utilizing ACT daily as a self-guided app for clients waiting for services at a college counseling center: A pilot study, Journal of American College Health, 70:3, 742-749, DOI: 10.1080/07448481.2020.1763366

Joëls M, Pu Z, Wiegert O, Oitzl MS, Krugers HJ. Learning under stress: how does it work? Trends Cogn Sci. 2006 Apr;10(4):152-8. doi: 10.1016/j.tics.2006.02.002. Epub 2006 Mar 2. PMID: 16513410.

Johansson, R., & Andersson, G. (2012). Internet-based psychological treatments for depression. *Expert review of neurotherapeutics*, *12*(7), 861-870

Joseph, S. A., Williams, R., Yule, W., & Walker, A. (1992). Factor analysis of the Impact of Events Scale with survivors of two disasters at sea. Personality and Individual Differences,

Karekla, M., Konstantinou, P., Ioannou, M., Kareklas, I., & Gloster, A. T. (2019). The phenomenon of treatment dropout, reasons and moderators in acceptance and commitment therapy and other active treatments. *Clinical Psychology in Europe*, *1*(3), 1-36.

Karlsson, E., Dybdahl, R., & Vittersø, J. (2006, September 21). The possible benefits of difficulty: How stress can increase and decrease subjective well-being. DOI: https://doi.org/10.1111/j.1467-9450.2006.00549.x

Karyotaki, E., Sijbrandij, M., Purgato, M., Acarturk, C., Lakin, D., Bailey, D., ... & Barbui, C. (2023). Self-Help Plus for refugees and asylum seekers: an individual participant data meta-analysis. *BMJ Ment Health*, *26*(1).

Kass, A. E., Trockel, M., Safer, D. L., Sinton, M. M., Cunning, D., Rizk, M. T., ... & Taylor, C. B. (2014). Internet-based preventive intervention for reducing eating disorder risk: A randomized controlled trial comparing guided with unguided self-help. *Behaviour research and therapy*, *63*, 90-98.

Katajavuori, N., Vehkalahti, K., & Asikainen, H. (2021). Promoting university students' well-being and studying with an acceptance and commitment therapy (ACT)-based intervention. Current Psychology, 42(6), 4900–4912.

Kate French, Nima Golijani-Moghaddam, Thomas Schröder, What is the evidence for the efficacy of self-help acceptance and commitment therapy? A systematic review and meta-analysis, Journal of Contextual Behavioral Science, Volume 6, Issue 4, 2017, Pages 360-374, ISSN 2212-1447, https://doi.org/10.1016/j.jcbs.2017.08.002.

Keyan, D., Habashneh, R., Akhtar, A., El-Dardery, H., Faroun, M., Abualhaija, A., Aqel, I. S., Dardas, L. A., & Bryant, R. (2024). Evaluating a stepped care model of psychological support for adults affected by adversity: study protocol for a randomised controlled trial in Jordan. *BMJ open*, *14*(2), e078091. https://doi.org/10.1136/bmjopen-2023-078091

Khaled, S. M., and Gray, R. (2019). Depression in migrant workers and nationals of Qatar: an exploratory cross-cultural study. Int. J. Soc. Psychiatry 65, 354–367. doi:10.1177/0020764019850589

Khumalo, I. P., Temane, Q. M., & Wissing, M. P. (2012). Socio-demographic variables, general psychological well-being and the mental health continuum in an African context. *Social Indicators Research*, *105*, 419-442.

Kim, J., & Kim, H. (2013). The experience of acculturative stress-related growth from immigrants' perspectives. *International Journal of Qualitative studies on Health and Well-being*, *8*(1), 21355.

Kira, I. A., et al. (2010). Cumulative tertiary appraisals of traumatic events across cultures: Two studies. https://doi.org/10.1080/15325024.2010.519288

Kivlighan, K. T., Granger, D. A., & Booth, A. (2005). Gender differences in testosterone and cortisol response to competition. Psychoneuroendocrinology, 30(1), 58-71.

Klein, A., Clucas, J., Krishnakumar, A., Ghosh, S. S., Van Auken, W., Thonet, B., Sabram, I., Acuna, N., Keshavan, A., Rossiter, H., Xiao, Y., Semenuta, S., Badioli, A., Konishcheva, K., Abraham, S. A., Alexander, L. M., Merikangas, K. R., Swendsen, J., Lindner, A. B., & Milham, M. P. (2021). Remote Digital Psychiatry for Mobile Mental Health Assessment and Therapy: MindLogger Platform Development Study. *Journal of medical Internet research*, *23*(11), e22369. https://doi.org/10.2196/22369

Krista Anderson-Ross. We Are What We Think: Downregulating the Chronic Stress Response with Technology-Assisted Mindfulness Meditation 2019. DOI 10.14200/jrm.2019.0116

Küchler, AM., Schultchen, D., Pollatos, O. *et al.* StudiCare mindfulness—study protocol of a randomized controlled trial evaluating an internet- and mobile-based intervention for college students with no and "on demand" guidance. *Trials* **21**, 975 (2020). https://doi.org/10.1186/s13063-020-04868-0

Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in onlineeducation courses. The Internet and Higher Education, 20(1), 35-50. https://doi.org/10.1016/j.iheduc.2013.10.001

Laberg, J.C., Eid, J., Johnsen, B.H., Eriksen, B.S., Zachariassen, K.K. (2000). Coping with Interrogations. In: McCann, C., Pigeau, R. (eds) The Human in Command. Springer, Boston, MA. https://doi.org/10.1007/978-1-4615-4229-2_22

Lamers, S. M., Glas, C. A., Westerhof, G. J., & Bohlmeijer, E. T. (2012). Longitudinal evaluation of the mental health continuum-short form (MHC-SF). *European journal of psychological assessment*.

Lantero, L., & Finocchietti, C. (2023). Recognising Refugee Qualifications for Access to Higher Education: A European Perspective. In Global Perspectives on the Difficulties and Opportunities Faced by Migrant and Refugee Students in Higher Education (pp. 57-79). IGI Global.

Larsson, G., Kempe, C. and Starrin, B. (1988), Appraisal and coping processes in acute time-limited stressful situations: A study of police officers. Eur. J. Pers., 2: 259-276. https://doi.org/10.1002/per.2410020404

Lavine, E. S. (2019). Psychotherapy Dropout and Socioeconomic Status: A Qualitative Analysis of College Students.

Lazarus, R. S. (1974). Psychological Stress and Coping in Adaptation and Illness. The International Journal of Psychiatry in Medicine, 5(4), 321-333. https://doi.org/10.2190/T43T-84P3-QDUR-7RTP

Lazarus, R. S. (1991). Emotion and adaptation. Oxford University Press.

Lehrer, P. M., & Woolfolk, R. L. (2007). Research on clinical issues in stress management. In P. M. Lehrer, R. L. Woolfolk, & W. E. Sime (Eds.), Principles and practice of stress management (3rd ed., pp. 703–721). The Guilford Press.

Levin, M. E., Pistorello, J., Hayes, S. C., Seeley, J. R., & Levin, C. (2015). Feasibility of an acceptance and commitment therapy adjunctive web-based program for counseling centers. *Journal of Counseling Psychology*, *62*(3), 529.

Levin, M. E., Pistorello, J., Seeley, J. R., & Hayes, S. C. (2014). Feasibility of a prototype web-based acceptance and commitment therapy prevention program for college students. *Journal of American College Health*, *62*(1), 20-30.

Levin, M.E., Hayes, S.C., Pistorello, J. and Seeley, J.R. (2016), Web-Based Self-Help for Preventing Mental Health Problems in Universities: Comparing Acceptance and Commitment Training to Mental Health Education. J. Clin. Psychol., 72: 207-225. https://doi.org/10.1002/jclp.22254

Lévy, E., El Banna, N., Baïlle, D., Heneman-Masurel, A., Truchet, S., Rezaei, H., ... & Vernis, L. (2019). Causative links between protein aggregation and oxidative stress: a review. International journal of molecular sciences, 20(16), 3896.

Lewis, C., Roberts, N. P., Gibson, S., & Bisson, J. I. (2020). Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: Systematic review and meta-analysis. *European journal of psychotraumatology*, *11*(1), 1709709.

Li, P., Wong, Y. J., & Toth, P. (2013). Asian international students' willingness to seek counselling: A mixed-methods study. *International Journal for the Advancement of Counselling*, *35*, 1-15.

Liem, A., Renzaho, A. M., Hannam, K., Lam, A. I., & Hall, B. J. (2021). Acculturative stress and coping among migrant workers: A global mixed-methods systematic review. *Applied Psychology: Health and Well-Being*, *13*(3), 491-517.

Linley, P.A. and Joseph, S. (2004), Positive change following trauma and adversity: A review. J. Traum. Stress, 17: 11-21. https://doi.org/10.1023/B:JOTS.0000014671.27856.7e

Lommel, L.L., Chen, JL. The Relationship Between Self-Rated Health and Acculturation in Hispanic and Asian Adult Immigrants: A Systematic Review. J Immigrant Minority Health 18, 468–478 (2016). https://doi.org/10.1007/s10903-015-0208-y

Lovibond, S.H., & Lovibond, P.F. (1995). Manual for the Depression Anxiety Stress Scales (2nd ed.). Sydney: Psychology Foundation.

Luethi, M., Meier, B., & Sandi, C. (2009). Stress effects on working memory, explicit memory, and implicit memory for neutral and emotional stimuli in healthy men. Frontiers in Behavioral Neuroscience, 2, Article 5.

Luisa F. Cañón, Evelyn R. Gould, Emily K. Sandoz, Orla Moran, Mikala A. Grimaldi, Cultural adaptation of ACT to support caregivers of autistic Latino children: A pilot study,

Journal of Contextual Behavioral Science, Volume 28, 2023, Pages 1-9, ISSN 2212-1447, https://doi.org/10.1016/j.jcbs.2023.03.003.

Luo, J., et al. (2023). The Stressful Personality: A Meta-Analytical Review of the Relation Between Personality and Stress. https://doi.org/10.1177/10888683221104002

Lupien, S., de Leon, M., de Santi, S. et al. Cortisol levels during human aging predict hippocampal atrophy and memory deficits. Nat Neurosci 1, 69–73 (1998). https://doi.org/10.1038/271

Machul, M., Bieniak, M., Chałdaś-Majdańska, J., Bąk, J., Chrzan-Rodak, A., Mazurek, P., ... & Dobrowolska, B. (2020). Lifestyle practices, satisfaction with life and the level of perceived stress of Polish and foreign medical students studying in Poland. International journal of environmental research and public health, 17(12), 4445.

Mahalik, J. R., Good, G. E., & Englar-Carlson, M. (2003). Masculinity scripts, presenting concerns, and help seeking: Implications for practice and training. *Professional Psychology: Research and Practice*, *34*(2), 123.

Maiworm, F., & Teichler, U. (2002). *Die Internationale Frauenuniversität aus der Sicht der Teilnehmerinnen* (pp. 45-87). VS Verlag für Sozialwissenschaften.

Masuda, A., & Tully, E. C. (2012). The role of mindfulness and psychological flexibility in somatization, depression, anxiety, and general psychological distress in a nonclinical college sample. *Journal of Evidence-Based Complementary & Alternative Medicine*, *17*(1), 66–71.

Matsumoto, D., LeRoux, J. A., Bernhard, R., & Gray, H. (2004). Unraveling the psychological correlates of intercultural adjustment potential. *International Journal of Intercultural Relations*, *28*(3-4), 281-309.

Matthew S. Tryon, Kimber L. Stanhope, Elissa S. Epel, Ashley E. Mason, Rashida Brown, Valentina Medici, Peter J. Havel, Kevin D. Laugero, Excessive Sugar Consumption May Be a Difficult Habit to Break: A View from the Brain and Body, The Journal of Clinical Endocrinology & Metabolism, Volume 100, Issue 6, 1 June 2015, Pages 2239–2247, https://doi.org/10.1210/jc.2014-4353

Matud, M. P., Díaz, A., Bethencourt, J. M., and Ibáñez, I. (2020). Stress and psychological distress in emerging adulthood: a gender analysis. *J. Clin. Med.* 9, 2859. doi: 10.3390/jcm9092859

Maymon, R., & Hall, N. C. (2021). A review of first-year student stress and social support. *Social Sciences*, *10*(12), 472.

McEwen, B. S. (1998). Stress, adaptation, and disease: Allostasis and allostatic load. Annals of the New York academy of sciences, 840(1), 33-44.

McEwen, B.S. (2001), Plasticity of the Hippocampus: Adaptation to Chronic Stress and Allostatic Load. Annals of the New York Academy of Sciences, 933: 265-277. https://doi.org/10.1111/j.1749-6632.2001.tb05830.x

Mediavilla, R., McGreevy, K. R., Felez-Nobrega, M., Monistrol-Mula, A., Bravo-Ortiz, M. F., Bayón, C., Rodríguez-Vega, B., Nicaise, P., Delaire, A., Sijbrandij, M., Witteveen, A. B., Purgato, M., Barbui, C., Tedeschi, F., Melchior, M., van der Waerden, J., McDaid, D., Park, A. L., Kalisch, R., Petri-Romão, P., … RESPOND Consortium (2022). Effectiveness of a stepped-care programme of internet-based psychological interventions for healthcare workers with psychological distress: Study protocol for the RESPOND healthcare workers randomised controlled trial. *Digital health*, *8*, 20552076221129084. https://doi.org/10.1177/20552076221129084

Mehdi Zemestani, Mojgan Hosseini, Julie M. Petersen, Michael P. Twohig, A pilot randomized controlled trial of culturally-adapted, telehealth group acceptance and commitment therapy for Iranian adolescent females reporting symptoms of anxiety, Journal of Contextual Behavioral Science, Volume 25, 2022, Pages 145-152, ISSN 2212-1447, https://doi.org/10.1016/j.jcbs.2022.08.001.

Meini, M. (2008). Mobilità e territorio. Flussi, attori, strategie (autore di più saggi nel volume, per complessive 173 pp.). Pàtron.

Mezuk, B., & Gallo, J. J. (2013). Depression and medical illness in late life: Race, resources, and stress. In H. Lavretsky, M. Sajatovic, & C. F. Reynolds III (Eds.), Late-life mood disorders (pp. 270–294). Oxford University Press. https://doi.org/10.1093/med/9780199796816.003.0016

MindLogger. [2020-07-06]. https://mindlogger.org/

Misirlis, N., et al. (2020). International students' loneliness, depression and stress levels in COVID-19 crisis: The role of social media and the host university. http://dx.doi.org/10.5281/zenodo.4256624

Mohsen Joshanloo, Marié P. Wissing, Itumeleng P. Khumalo, Sanne M.A. Lamers, Measurement invariance of the Mental Health Continuum-Short Form (MHC-SF) across three cultural groups, Personality and Individual Differences, Volume 55, Issue 7, 2013, Pages 755-759, ISSN 0191-8869, https://doi.org/10.1016/j.paid.2013.06.002.

Moore, S. A., Zoellner, L. A., & Mollenholt, N. (2008). Are expressive suppression and cognitive reappraisal associated with stress-related symptoms?. *Behaviour research and therapy*, *46*(9), 993-1000.

Moskowitz, J. T., Hult, J. R., Bussolari, C., & Acree, M. (2009). What works in coping with HIV? A meta-analysis with implications for coping with serious illness. Psychological Bulletin, 135(1), 121–141. https://doi.org/10.1037/a0014210

Mowbray, C. T., Mandiberg, J. M., Stein, C. H., Kopels, S., Curlin, C., Megivern, D., . . . Lett, R. (2006). Campus mental health services: Recommendations for change. American Journal of Orthopsychiatry, 76(2), 226-237.

Mr. Raymond Fleming, Dr. Andrew Baum Ph.D. , Ms. Martha M. Gisriel & Dr. Robert J.Gatchel Ph.D. (1982) Mediating Influences of Social Support on Stress at Three Mile Island, Journal of Human Stress, 8:3, 14-23, DOI: 10.1080/0097840X.1982.9936110

Murnane, E. L., Cosley, D., Chang, P., Guha, S., Frank, E., Gay, G., & Matthews, M. (2016). Self-monitoring practices, attitudes, and needs of individuals with bipolar disorder: implications for the design of technologies to manage mental health. *Journal of the American Medical Informatics Association*, *23*(3), 477-484.

Mustanski, B., & Liu, R. T. (2013). A longitudinal study of predictors of suicide attempts among lesbian, gay, bisexual, and transgender youth. Archives of sexual behavior, 42, 437-448.

Muto, T., Hayes, S. C., & Jeffcoat, T. (2011). The effectiveness of acceptance and commitment therapy bibliotherapy for enhancing the psychological health of Japanese college students living abroad. Behavior Therapy, 42(2), 323–335.

Naghmeh Shafiei et al. (2012). Acute Stress Induces Selective Alterations in Cost/Benefit Decision-Making.

Naldi, M. (2020). A conversation analysis of interactions in personal finance forums. In Text Analytics: Advances and Challenges (pp. 65-74). Springer International Publishing.

Neff, L. A., & Karney, B. R. (2004). How does context affect intimate relationships? Linking external stress and cognitive processes within marriage. Personality and Social Psychology Bulletin, 30(2), 134-148.

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy? *Clinical psychology review*, *31*(1), 89-103.

Nicole L. Novak, et al. (2016, November 15). Change in birth outcomes among infants born to Latina mothers after a major immigration. DOI: 10.1093/ije/dyw346

Novak, N. L., et al. (2016, November 15). Change in birth outcomes among infants born to Latina mothers after a major immigration. Doi: 10.1093/ije/dyw346

Oecd, F. A. O. (2022). OECD-FAO agricultural outlook 2022-2031.

Ömer Özer, Burak Köksal, Ahmet Altinok, Understanding university students' attitudes and preferences for internet-based mental health interventions, Internet Interventions, Volume 35, 2024, 100722, ISSN 2214-7829, https://doi.org/10.1016/j.invent.2024.100722.

Oosterholt, B. G., Maes, J. H., Van der Linden, D., Verbraak, M. J., & Kompier, M. A. (2015). Burnout and cortisol: evidence for a lower cortisol awakening response in both clinical and non-clinical burnout. Journal of psychosomatic research, 78(5), 445-451. Epub 2014 Nov 8. PMID: 25433974.

Oudin, A., Maatoug, R., Bourla, A., Ferreri, F., Bonnot, O., Millet, B., Schoeller, F., Mouchabac, S., & Adrien, V. (2023). Digital Phenotyping: Data-Driven Psychiatry to Redefine Mental Health. *Journal of medical Internet research*, *25*, e44502. https://doi.org/10.2196/44502

Panajiota Räsänen, Päivi Lappalainen, Joona Muotka, Asko Tolvanen, Raimo Lappalainen, An online guided ACT intervention for enhancing the psychological wellbeing of university

students: A randomized controlled clinical trial, Behaviour Research and Therapy, Volume 78, 2016, Pages 30-42, ISSN 0005-7967, https://doi.org/10.1016/j.brat.2016.01.001.

Park, S. Y., Cho, S., Park, Y., Bernstein, K. S., & Shin, J. K. (2013). Factors associated with mental health service utilization among Korean American immigrants. *Community mental health journal*, *49*, 765-773.

Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. International journal of adolescence and youth, 25(1), 104-112.

Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological assessment*, *5*(2), 164.

Pavot, W., & Diener, E. (2008). The satisfaction with life scale and the emerging construct of life satisfaction. *The journal of positive psychology*, *3*(2), 137-152.

Pennell, D., et al. (2023). Australian school psychologists' and counselors' experience of stress. https://doi.org/10.1177/20556365231207410

Pettit, H., & Ruijtenberg, W. (2019). Migration as hope and depression: existential im/mobilities in and beyond Egypt. Mobilities, 14(5), 730-744. https://doi.org/10.1080/17450101.2019.1609193

Pistorello, J., Hayes, S. C., Lillis, J., Long, D. M., Christodoulou, V., Lejeune, J., ... & Yadavaia, J. (2013). Acceptance and commitment therapy (ACT) in classroom settings.

Porcelli, A. J., & Delgado, M. R. (2009). Acute Stress Modulates Risk Taking in Financial Decision Making. Psychological Science, 20(3), 278-283. https://doi.org/10.1111/j.1467-9280.2009.02288.x

Purgato, M., Carswell, K., Tedeschi, F., Acarturk, C., Anttila, M., Au, T., Bajbouj, M., Baumgartner, J., Biondi, M., Churchill, R., Cuijpers, P., Koesters, M., Gastaldon, C., Ilkkursun, Z., Lantta, T., Nosè, M., Ostuzzi, G., Papola, D., Popa, M., Roselli, V., … Barbui, C. (2021). Effectiveness of Self-Help Plus in Preventing Mental Disorders in Refugees and Asylum Seekers in Western Europe: A Multinational Randomized Controlled Trial. *Psychotherapy and psychosomatics*, *90*(6), 403–414. https://doi.org/10.1159/000517504

Putman P, Antypa N, Crysovergi P, van der Does WA. Exogenous cortisol acutely influences motivated decision making in healthy young men. Psychopharmacology (Berl). 2010 Feb;208(2):257-63. doi: 10.1007/s00213-009-1725-y. Epub 2009 Dec 2. PMID: 19953227;PMCID: PMC2797621.

Quinn, N., Wilson, A., MacIntyre, G., Tinklin, T., 2009. 'People look at you differently':Students' experience of mental health support within higher education. British Journal of Guidance Counselling 37 (4), 405–418

Rafidah, K., Azizah, A., Norzaidi, M. D., Chong, S. C., Salwani, M. I., & Noraini, I. (2009). The impact of perceived stress and stress factors on academic performance of pre-diploma science students: a Malaysian study. *International journal of scientific research in education*, *2*(1), 13-26.

Raio, C. M., Orederu, T. A., Palazzolo, L., & Phelps, E. A. (2013). Cognitive emotion regulation fails the stress test. Proceedings of the National Academy of Sciences, 110(37), 15139-15144. https://doi.org/10.1073/pnas.1305706110

Raja, R., Zhou, W., Li, X. Y., Ullah, A., & Ma, J. (2021). Social identity change as an integration strategy of international students in China. International Migration, 59(5), 230-247.

Rees, B., Travis, F., Shapiro, D., & Chant, R. (2014). Significant reductions in posttraumatic stress symptoms in Congolese refugees within 10 days of transcendental meditation practice. *Journal of traumatic stress*, *27*(1), 112-115.

Regehr et al., Interventions to reduce stress in university students: A review and meta-analysis, 2013; https://doi.org/10.1016/j.jad.2012.11.026

Register, A. C., Beckham, J. C., May, J. G., & Gustafson, D. J. (1991). Stress inoculation bibliotherapy in the treatment of test anxiety. *Journal of Counseling Psychology*, *38*(2), 115.

Repetti, R. L., Taylor, S. E., & Seeman, T. E. (2002). Risky families: Family social environments and the mental and physical health of offspring. Psychological Bulletin, 128(2), 330–366. https://doi.org/10.1037/0033-2909.128.2.330

Richards, D., & Richardson, T. (2012). Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clinical psychology review*, *32*(4), 329-342.

Richmond, B. (1994). System dynamics/systems thinking: Let's just get on with it. *System Dynamics Review*, *10*(2-3), 135-157

Riepenhausen, A., et al. (2022). Positive Cognitive Reappraisal in Stress Resilience, Mental Health, and Well-Being: A Comprehensive Systematic Review. https://orcid.org/0000-0001-8749-5349

Roe, D., Dekel, R., Harel, G., & Fennig, S. (2006). Clients' reasons for terminating psychotherapy: A quantitative and qualitative inquiry. Psychology and Psychotherapy, 79, 529-538. https://doi.org/10.1348/147608305X90412

Roos, R., Witteveen, A. B., Ayuso-Mateos, J. L., Barbui, C., Bryant, R. A., Felez-Nobrega, M., Figueiredo, N., Kalisch, R., Haro, J. M., McDaid, D., Mediavilla, R., Melchior, M., Nicaise, P., Park, A. L., Petri-Romão, P., Purgato, M., van Straten, A., Tedeschi, F., Underhill, J., Sijbrandij, M., … RESPOND Consortium (2023). Effectiveness of a scalable, remotely delivered stepped-care intervention to reduce symptoms of psychological distress among Polish migrant workers in the Netherlands: study protocol for the RESPOND randomised controlled trial. *BMC psychiatry*, *23*(1), 801. https://doi.org/10.1186/s12888-023-05288-5

Rousseau C, Frounfelker RL. Mental health needs and services for migrants: an overview for primary care providers. J Travel Med. 2019 Feb 1;26(2):tay150. doi: 10.1093/jtm/tay150. PMID: 30561687.

Rowan Burckhardt, Vijaya Manicavasagar, Philip J. Batterham, Dusan Hadzi-Pavlovic, A randomized controlled trial of strong minds: A school-based mental health program combining acceptance and commitment therapy and positive psychology, Journal of School Psychology, Volume 57, 2016, Pages 41-52, ISSN 0022-4405, https://doi.org/10.1016/j.jsp.2016.05.008.

Rubeis, G. (2022). iHealth: The ethics of artificial intelligence and big data in mental healthcare. *Internet Interventions*, *28*, 100518.

Sam, D. L., & Berry, J. W. (2010). Acculturation: When Individuals and Groups of Different Cultural Backgrounds Meet. Perspectives on Psychological Science, 5(4), 472-481. https://doi.org/10.1177/1745691610373075

Sapolsky R. The Uniqueness of Humans. 2009. https://www.ted.com/talks/robert_sapolsky_the_uniqueness_of_humans.

Sapolsky, R. M. (2002). Endocrinology of the stress-response. In J. B. Becker, S. M.

Sapolsky, R. M. (2004). Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping. Holt paperbacks.

Sauter, S. L., & Murphy, L. R. (1995). Organizational risk factors for job stress (pp. xii-400). American Psychological Association.

Schmidt, N. B., Eggleston, A. M., Woolaway-Bickel, K., Fitzpatrick, K. K., Vasey, M. W., & Richey, J. A. (2007). Anxiety Sensitivity Amelioration Training (ASAT): A longitudinal primary prevention program targeting cognitive vulnerability. *Journal of anxiety disorders*, *21*(3), 302-319.

Segerstrom SC, Geiger PJ, Boggero IA, Schmitt FA, Sephton SE. Endogenous Cortisol Exposure and Declarative Verbal Memory: A Longitudinal Study of Healthy Older Adults. Psychosom Med. 2016 Feb-Mar;78(2):182-91. doi: 10.1097/PSY.0000000000000249. PMID: 26569538; PMCID: PMC4738083.

Selye, H. (1946, February 1). The general adaptation syndrome and the diseases of adaptation. DOI: https://doi.org/10.1210/jcem-6-2-117

Selye, H. (1956). The stress of life. McGraw-Hill.

Selye, H. (1970). The evolution of the stress concept: Stress and cardiovascular disease. The American journal of cardiology, 26(3), 289-299.

Selye, H. (1976, July 3). Forty years of stress research: principal remaining problems and misconceptions. PMC1878603

Shafiei, N., et al. (2012). Acute Stress Induces Selective Alterations in Cost/Benefit Decision-Making.

Shelley Viskovich, Kenneth I. Pakenham, James A. Fowler, A mixed-methods evaluation of experiential intervention exercises for values and committed action from an Acceptance and Commitment Therapy (ACT) mental health promotion program for university students, Journal of Contextual Behavioral Science, Volume 22, 2021, Pages 108-118, ISSN 2212-1447, https://doi.org/10.1016/j.jcbs.2021.10.001.

Shepherd, K., Golijani-Moghaddam, N., & Dawson, D. L. (2022). Acting towards better living during COVID-19: The effects of acceptance and commitment therapy for individuals affected by COVID-19. Journal of Contextual Behavioral Science, 23, 98–108.

Simon Grégoire, Lise Lachance, Thérèse Bouffard, Frédérick Dionne, The Use of Acceptance and Commitment Therapy to Promote Mental Health and School Engagement in University Students: A Multisite Randomized Controlled Trial, Behavior Therapy,Volume 49, Issue 3, 2018, Pages 360-372, ISSN 0005-7894, https://doi.org/10.1016/j.beth.2017.10.003.

Smyth, J. M., et al. (2023). Computing Components of Everyday Stress Responses: Exploring Conceptual Challenges and New Opportunities. https://doi.org/10.1177/17456916221082108

Soylu, A. (2020). Immigrant Workers, Foreign Students, and Stress.

Spijkerman, M. P. J., Pots, W. T. M., & Bohlmeijer, E. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical psychology review*, *45*, 102-114.

Stafford-Brown, J., & Pakenham, K. I. (2012). The effectiveness of an ACT informed intervention for managing stress and improving therapist qualities in clinical psychology trainees. Journal of Clinical Psychology, 68(6), 592–513.

Staniscia, B. (2012). Mobility of students and attractiveness of universities. The case of Sapienza University of Rome. International Review of Sociology, 22(2), 245-258.

Steffen, P. R. (2016). Treating Chronic Stress to Address the Growing Problem of Depression and Anxiety: Biofeedback and Mindfulness as Simple, Effective Preventive Measures. https://doi.org/10.1177/237273221668533

Stewart, C., White, R. G., Ebert, B., Mays, I., Nardozzi, J., & Bockarie, H. (2016). A preliminary evaluation of Acceptance and Commitment Therapy (ACT) training in Sierra Leone. *Journal of Contextual Behavioral Science*, *5*(1), 16-22.

Strentz, T., & Auerbach, S. M. (1988). Adjustment to the stress of simulated captivity: Effects of emotion-focused versus problem-focused preparation on hostages differing in locus

of control. Journal of Personality and Social Psychology, 55(4), 652–660. https://doi.org/10.1037/0022-3514.55.4.652.

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: A metaanalysis. Journal of Consulting and Clinical Psychology, 80, 547-559. https://doi.org/10.1037/a0028226

Taborsky, B., English, S., Fawcett, T. W., Kuijper, B., Leimar, O., McNamara, J. M., ... & Sandi, C. (2021). Towards an evolutionary theory of stress responses. Trends in ecology & evolution, 36(1), 39-4

Taylor, S. E. (2006). Tend and Befriend: Biobehavioral Bases of Affiliation Under Stress.Current Directions in Psychological Science, 15(6), 273-277. https://doi.org/10.1111/j.1467-8721.2006.00451.x

Teresa E. Seeman, Bruce S. McEwen, Burton H. Singer, Marilyn S. Albert, John W. Rowe, Increase in Urinary Cortisol Excretion and Memory Declines: MacArthur Studies of Successful Aging, The Journal of Clinical Endocrinology & Metabolism, Volume 82, Issue 8, 1 August 1997, Pages 2458–2465, https://doi.org/10.1210/jcem.82.8.4173

Thomas, L., Orme, E., & Kerrigan, F. (2020). Student loneliness: The role of social media through life transitions. Computers & Education, 146, 103754.

Thomson, M.S., Chaze, F., George, U. et al. Improving Immigrant Populations' Access to Mental Health Services in Canada: A Review of Barriers and Recommendations. J Immigrant Minority Health 17, 1895–1905 (2015). https://doi.org/10.1007/s10903-015-0175-3

Tiwari, P., Bhat, A. K., & Tikoria, J. (2017). An empirical analysis of the factors affecting social entrepreneurial intentions. Journal of Global Entrepreneurship Research, 7(1). https://doi.org/10.1186/s40497-017-0067-1

Tol WA, Leku MR, Lakin DP, Carswell K, Augustinavicius J, Adaku A, Au TM, Brown FL, Bryant RA, Garcia-Moreno C, Musci RJ, Ventevogel P, White RG, van Ommeren M. Guided self-help to reduce psychological distress in South Sudanese female refugees in Uganda: a cluster randomised trial. Lancet Glob Health. 2020 Feb;8(2):e254-e263. doi: 10.1016/S2214-109X(19)30504-2. PMID: 31981556; PMCID: PMC9899129.

Trautmann, S., Rehm, J., & Wittchen, H.-U. (2016). The economic costs of mental disorders: Do our societies react appropriately to the burden of mental disorders? EMBO Reports, 17(9), 1245-1249. https://doi.org/10.15252/embr.201642951

Tsoory, M., Cohen, H., & Richter-Levin, G. (2007). Juvenile stress induces a predisposition to either anxiety or depressive-like symptoms following stress in adulthood. *European Neuropsychopharmacology*, *17*(4), 245-256.

Unsworth, K. L., Dmitrieva, A., & Adriasola, E. (2013). Changing behaviour: Increasing the effectiveness of workplace interventions in creating pro-environmental behaviour change. Journal of Organizational Behavior, 34(2), 211-229.

Van Ballegooijen, W., Cuijpers, P., Van Straten, A., Karyotaki, E., Andersson, G., Smit, J. H., & Riper, H. (2014). Adherence to Internet-based and face-to-face cognitive behavioural therapy for depression: a meta-analysis. *PloS one*, *9*(7), e100674.

van Genugten, C. R., Schuurmans, J., Lamers, F., Riese, H., Penninx, B. W., Schoevers, R. A., ... & Smit, J. H. (2020). Experienced burden of and adherence to smartphone-based ecological momentary assessment in persons with affective disorders. *Journal of clinical medicine*, *9*(2), 322.

van 't Hof, E., Heim, E., Abi Ramia, J., Burchert, S., Cornelisz, I., Cuijpers, P., El Chammay, R., Harper Shehadeh, M., Noun, P., Smit, F., van Klaveren, C., van Ommeren, M., Zoghbi, E., & Carswell, K. (2021). Evaluating the Effectiveness of an E-Mental Health Intervention for People Living in Lebanon: Protocol for Two Randomized Controlled Trials. *JMIR research protocols*, *10*(1), e21585. https://doi.org/10.2196/21585

Vancampfort, D., Sánchez, C. P. R., Hallgren, M., Schuch, F., Firth, J., Rosenbaum, S., ... & Stubbs, B. (2021). Dropout from exercise randomized controlled trials among people with anxiety and stress-related disorders: a meta-analysis and meta-regression. *Journal of affective disorders*, *282*, 996-1004.

Vergara, M. B., & Noom, S. H. Acculturative stress and coping among Burmese women migrant workers in Thailand. floating population in China. Chinese Journal of Epidemiology, 38(9), 1226–1230

Viskovich S, Pakenham Dr KI. Pilot Evaluation of a web-based acceptance and commitment therapy program to promote mental health skills in university students. *J Clin Psychol*. 2018; 74: 2047–2069. https://doi.org/10.1002/jclp.22656

Wang, S., Zhou, Y., Yu, S., Ran, L. W., Liu, X. P., & Chen, Y. F. (2017). Acceptance and commitment therapy and cognitive–behavioral therapy as treatments for academic procrastination: A randomized controlled group session. Research on Social Work Practice, 27(1), 48–58.

Wang, S., Zhou, Y., Yu, S., Ran, L.-W., Liu, X.-P., & Chen, Y.-F. (2017). Acceptance and Commitment Therapy and Cognitive–Behavioral Therapy as Treatments for Academic Procrastination: A Randomized Controlled Group Session. Research on Social Work Practice, 27(1), 48-58. https://doi.org/10.1177/1049731515577890

Wardle J, Chida Y, Gibson EL, Whitaker KL, Steptoe A. Stress and adiposity: a meta-analysis of longitudinal studies. Obesity (Silver Spring). 2011 Apr;19(4):771-8.

Watson-Singleton, N. N., Black, A. R., & Spivey, B. N. (2019). Recommendations for a culturally responsive mindfulness-based intervention for African Americans. Complementary Therapies in Clinical Practice, 34(404), 132–138. 10.1016/j.ctcp.

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. Professional Psychology: Research and Practice, 24, 190–195. doi:10.1037/0735-7028.24.2.190

Worsley JD, Pennington A, Corcoran R. Supporting mental health and wellbeing of university and college students: A systematic review of review-level evidence of interventions. PLoS One. 2022 Jul 29;17(7): e0266725. doi: 10.1371/journal.pone.0266725. PMID: 35905058; PMCID: PMC9337666.

Worsley, J. D., Pennington, A., & Corcoran, R. (2022). Supporting mental health and wellbeing of university and college students: A systematic review of review-level evidence of interventions. *PloS one*, *17*(7), e0266725. https://doi.org/10.1371/journal.pone.0266725

Xu, H., O'Brien, W. H., & Chen, Y. (2020). Chinese international student stress and coping: A pilot study of acceptance and commitment therapy. Journal of Contextual Behavioral Science, 15, 135–141.

Yusufov et al., 2019; Meta-Analytic Evaluation of Stress Reduction Interventions for Undergraduate and Graduate Students; http://dx.doi.org/10.1037/str0000099

Żemojtel-Piotrowska, M., Piotrowski, J. P., Osin, E. N., Cieciuch, J., Adams, B. G., Ardi, R., ... & Maltby, J. (2018). The mental health continuum-short form: The structure and application for cross-cultural studies–A 38 nation study. *Journal of clinical psychology*, *74*(6), 1034-1052.

Zhao, H., Xiong, J., Zhang, Z., & Qi, C. (2021). Growth mindset and college students' learning engagement during the COVID-19 pandemic: A serial mediation model. *Frontiers in Psychology*, *12*, 621094.

Zhuzha, K. (2018). *International Students' Intentions to Seek Group Therapy and Self-Stigma: Effects of Informational and Therapist Rapport Interventions* (Doctoral dissertation, Auburn University).

Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990). Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment, 55(3-4), 610-617.