# ROLE OF RESILIENCE AND EMOTION REGULATION IN THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND PROCRASTINATION AMONG UNIVERSITY STUDENTS

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**(2025)**

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Submitted to the Department of Psychology (Female Campus),

International Islamic University Islamabad

In partial fulfilment of the requirements

For the award of degree of

MS

IN

PSYCHOLOGY

By

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**2025**

Role of resilience and emotion regulation in the relationship between physical activity and procrastination among university students

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## DECLARATION

I, Ms. **SANIA KANWAL**, Registration No. **360-FSS/MSEP/F23** students of **MS** in the subject of Psychology, session **2023-2025**, hereby declare that the matter printed in the thesis titled: Role of Resilience and Emotion Regulation in the Relationship between Physical Activity and Procrastination Among University Students is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research Institution etc. in Pakistan or abroad.

Sania Kanwal

Signatures of Deponent

27 Oct 25

Dated:

## RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled: Role of Resilience and Emotion Regulation in the Relationship between Physical Activity and Procrastination Among University Students has been carried out and completed by Ms. Sania Kanwal, Registration No. 360-FSS/MSEP/F23 under my supervision.

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## Dedication

To My Beloved Parents *MANZOOR AHMED & PARVEEN AKTTHAR*, whose endless encouragement and selfless sacrifices have been the guiding light of my academic journey. Without your support, this achievement would not have been possible. I would also like to dedicate my work to my beloved siblings, whose prayers and support helped me to continue with my studies and complete my degree.

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## List of Abbreviations

| | |
|---|---|
| SPSS | Statistical Package for Social Sciences |
| IPAQ | International Physical Activity Questionnaire |
| ERQ | Emotion Regulation Questionnaire |
| BRS | Brief Resilience Scale |
| GPS | General Procrastination |
| SDT | Self-Determination Theory |
| PA | Physical Activity |
| ER | Emotion Regulation |
| CR | Cognitive Reappraisal |
| ES | Expressive Suppression |

## Acknowledgement

Firstly, and foremost, all praise and gratitude are due to Allah Almighty, who granted me the wisdom, patience, and perseverance to accomplish this work

I am deeply grateful to my supervisor, Dr. Rabia Mushtaq, for her invaluable guidance, constructive feedback, and continuous encouragement, which greatly enriched this research.

I am profoundly grateful to my parents for their belief in me, their patience and unwavering support throughout this scholarly journey. Lastly, I would like to direct a special thanks to my siblings for their support and understanding. Each of these individuals has played an integral role in the completion of this thesis, and for that, I am sincerely thankful.

**SANIA KANWAL**

## Abstract

The present study aims to find out the relationship between physical activity, procrastination among university students and also to examine the mediating role of resilience and moderating role of emotion regulation between physical activity and procrastination. The sample comprised of 300 university students from different public and private universities of the Rawalpindi and Islamabad. Emotion Regulation Questionnaire (Gross & John., 2003), General Procrastination Scale (Lodha et., 2016), International Physical Activity Questionnaire (Craig et al., 2003) and Brief Resilience Scale (Smith et al., 2008) has been used for data collection. The findings of the study showed a significantly negative relationship of physical activity with procrastination among university students. Resilience mediates the relationship between physical activity and procrastination among university students. Furthermore, among the two subscales of emotion regulation, expressive suppression emerged as a significant moderator between the relationship of physical activity and procrastination, whereas cognitive reappraisal showed no significant effect. The t-test analysis revealed that male students exhibit greater levels of physical activity and resilience. Furthermore, students with master's degrees procrastinate more than those with students with bachelor's degrees. Additionally, the study found that the age group 18-22 were more physically active, whereas the age group 23-27 showed more procrastination and resilience. Additionally, university students who are day scholars have higher levels of procrastination than those who are hostelite. The present study showed the importance of involvement in physical activity in enhancing emotional regulation, resilience and reducing maladaptive strategy in university students.

*Keyword***:** Physical activity, procrastination, resilience and emotion regulation

# Chapter 1

## Introduction

Students are an integral part of our society. They spent most time gaining knowledge, skills to become an active part of society. So, their physical and mental health is a major concern for students and society. As many of today's students are suffering from stress, anxiety and depression (Asif et al., 2020), Procrastination is however, another big issue that students nowadays are suffering from. A study conducted on students revealed that at least 54% students frequently experienced academic procrastination (Özer, 2009), another study found that nearly all students (100%) do procrastinate to some extent (Kosnin and Khan, 2014). College students and undergraduate students are found to procrastinate more than university and high school students. (Khan et al., 2014, Özer, 2011). According to Khan et al., (2014) male students procrastinate more than female students. Many factors like academic pressure, societal pressure and financial problems etc. are contributing to decline in students' mental health. So, the importance of physical activity has been increased now a days to improved mental health of students like Mason and Holt (2012) in his review highlights that physical activity can be effective in mental health by improving social interaction and personal achievement. By improving the levels of physical activity in a daily routine will actually benefit both physical health and mental well-being. As Saxena et al. (2005) highlight that physical activity can serve as a primary intervention for the enhancement of mental health and can also serves as a tool in rehabilitation for some mental health problems.

**Physical Activity**

Physical activity is described as different type of bodily movement that includes variety of activities, like different types of exercises, sports, gardening, walking or household chores (Hardman & Stensel, 2009). Physical activity can be different type of moderate or energetic-intensity type of activities. Physical activity improves a person's health. Different kind of physical activity include walking, sports, cycling, wheeling, active recreation and play can be done at different level (World Health Organization, 2024). Physical activity is useful for reducing depressive symptoms, mental stress, anxiety and also enhancing mood (Kayani et al., 2020). Among university students, physical activity has a negative correlation with academic burnout (Rehman et al., 2024), a positive correlation with mental well-being (Ho et al., 2015), and a strong correlation with academic achievements (Ávila-García et al., 2020). Men were more active than women, according to the World Health Organisation. Similarly, according to the WHO data, 81% of adolescents between the ages of 11 and 17 were not physically active. According to Seçer and Yildizhan (2020), there is evidence that men engage in greater physical activities than women. Being physically active can assist in managing stress, anxiety, and tension, which in turn aids with Emotion regulation (Zhu et al., 2022)**.**

Exercise as a solution was advised to overcome the challenges and maintain the mental and physical fitness (Ghrouz et al. 2019) and to reduce the negative symptoms of schizophrenia (Sabe et al. 2019). Additionally, research by Hallgren et al. (2018) has demonstrated that exercise can help prevent alcohol use disorder and issues like diabetes, hypertension or any other cardiovascular issues that can occur with alcohol use disorder. Although there is a positive attitude towards physical activity in general but by the study of Habib et al. (2022), It can be determined that Pakistani teens and students lack an appropriate optimal level of physical activity in their daily

routine. Alam et al. (2021) sample showed that 41 percent showed moderate level of physical activity level while 13.7 percent of participants were totally inactive, four in each ten students are physically inactive (Pengpid et al., 2015). Imtiaz et al. (2020) studies on physical activity among adolescents in Pakistan describe a wide variation, with some showing as few as 6% being physically active, while others show up to 70%. This meta-analysis suggested that about 36% of adolescents in Pakistan are physically active on average. Additionally, university students exhibit modest levels of physical activity and fitness (Kljajević et al., 2021). Reason of low physical activity can be many for example busy schedules of part time jobs, burden of study or poor health. (Safdar et al., 2024).

**Procrastination**

Procrastination can be the tendency or inclination to delay the start or finishing a desired task to the point of experiencing discomfort (Ferrari et al., 2017). Rakes & Dunn (2010) defined Procrastination as the purposeful delaying of necessary chores or tasks. In investigating the connection between self-regulation and procrastination, it is found that people who procrastinate regularly face trouble regulating their emotion. (Ferrari et al., 2017). Procrastinators frequently struggle with organization and the time management, which can intensify their anxiety and panic. Consequently, they may develop low self-esteem. (Abbasi & Alghamdi, 2015).

Procrastination can negatively effects students learning can result in low achievements or failure in exams. This is further supported by multiple studies conducted in this field. As Hussain and Sultan (2010) conducted a study to know the factors of procrastination and how its impacting on university students of Pakistan and concluded that procrastination can affects on students's academic performance, learning and participation in classroom. The authors also discovered that

students' poor time management and excessive workload contributed to procrastination. Students' procrastination and inability to complete their work on time appeared to be caused by a variety of factors, including illnesses, social and family issues, lack of motivation and interest, overconfidence, laziness, a lack of guidance and counseling, lack of coordination with their classmates, dependency habits, communication gaps, and enjoying their classmates' company. Students are occasionally forced to postpone their academic work due to unforeseen issues or circumstances. ((Hussain & Sultan, 2010). Procrastination can also be caused by the internet addiction (Saleem et al., 2015). In addition to Awan et al. (2023) conducted quantitative correlational research on students with age range 18 - 25 years, from both private and public universities of Lahore and result found that procrastination is greatly linked with fear of negative evaluation. The study conducted on college students by Shi et al. (2021) found that 53% of total students showed procrastination behavior in their daily life. Kosnin and Khan (2014) conducted study on students of different universities of two countries Malaysia and Pakistan and the results showed that the students of both countries are affected by procrastination. The results of the study found that almost 100% of the students procrastinate to some degree. There was majority of moderate procrastinators as compared to mild and severe procrastinators among these university students. However, one study showed that there was significant negative correlation between procrastination and self-esteem among Pakistani university students. (Saleem and Rafique, 2012)

**Resilience**

Sahi (2016) defined resilience as a capability to recover from a difficult and tough situation and as a constructive and positive personality trait that improved individual and control the harmful effect of stressful situation. Resilience is a positive emotion have positive impact on reducing distress from the life of individual (Matzka et al., 2016) and a negative association with perceived

stress. (Thomas & Zolkoski, 2020). When an individual can escape intense, frequent, or chronic stress, or when the consequences are mitigated by supportive connections, resilience is more likely to be developed in a person. In addition to Herrman et al. (2011) investigate two important resilience concepts. One is how resilience is dynamic or interactive throughout life, and the other is how resilience interacts with key life functions like attachments and intimate relationships.

According to McRae et al. (2012), resilience is the capacity to regulate negative beliefs and substitute them out for more positive ones through cognitive reappraisal. This emotion regulation technique, often referred to as cognitive flexibility or cognitive reframing, involves altering one's perspective on circumstances or events. Resilience was greatly linked to re-evaluating negative or traumatic experiences to identify the positive aspects (Gross, 2002). Haider et al. (2022) highlight the importance of strategies that by improving life satisfaction resilience can be enhanced students. Tafoya et al. (2023) also explained that resilience also had the influence on the relationship between sleep and perceived stress. Auttama et al. (2021) study showed that the majority of university students had mental health problems but those students who had a close relationship with friends was significantly associated with high resilience.

Low and Chong (2023) study focused on how the is study also shows that health science resilience of university students could be enhanced by reducing the fear of negative evaluation, and results also showed that helicopter parenting can predict resilience. Resilience is also positively correlated with self-efficacy (Konaszewski et al. 2019; Siddique et al., 2021). Moreover, the findings of Sarmiento et al. (2021) indicated that university students usually had high levels of resilience. The survey also revealed that males were more resilient than female students. Resilience is higher among students who live alone or with persons other than their parents.

Additionally, this study demonstrates that students studying health sciences were more likely to be flexible, handle today's difficulties, and believe in their ability to overcome adversity. Rasheed et al. (2022) study highlighted the need for effective actions to improve meaningfulness and strength among university students. Moreover, the study by Hornor (2017) focused on resilience as an intervention to enhance personal strengths and interests, such as involvement in academic, athletic, or artistic activities

**Emotion Regulation**

Emotion regulation is described as the ability to control and govern one's emotions. It includes both emotional experience and emotional expression. Emotion experience means the person's feelings, and emotion expression means how the individual expresses their thoughts and feelings (Gross & John, 2003). Furthermore, emotion regulation was described as the activation of a goal to modify the emotion-generating process (Gross, 2015). Emotion regulation theory explained that extrinsic emotion regulation is the control of another person's emotions, whereas intrinsic emotion regulation is the control of one's own emotions. Gross (2015). Extrinsic emotion regulation can help reduce depressive symptoms like negative mood and persistent negative thinking. (Massarwe & Cohen, 2023). Effective emotion regulation skills can determine a person's behavior pattern in their life (Supervía & Robres, 2021). However, it can be difficult for people with substance use disorders. (Stellern et al., 2022).

According to the study, both positive and negative emotion control were involved, and behavioural skills were more strongly associated with substance use than cognitive skills. (Weiss et al., 2021). Furthermore, the significance of better emotion regulation for enhanced well-being in individuals with mental illnesses was examined in the Kraiss et al. (2020) study. Numerous

studies have examined the significance of particular emotion management techniques as well as general emotion regulation deficiencies in the setting of psychopathology. The results of a meta-analysis study that examined the connection between emotion regulation and well-being revealed that the strategies of avoidance and rumination had significant, small to moderate negative relationships with well-being, while reappraisal and acceptance had positive relationships. Overall, there was a moderately unfavorable connection between well-being and emotion regulation. This study explains that when people use strategies like avoiding or rumination, it lowers the well-being of an individual, and when people use the positive strategies like reappraisal (evaluation of the situation), accepting their emotions, they have good well-being.

As every young adolescent experience major social, cognitive, and biological change during the critical stage of adolescence, it is essential for the development of better emotion control skills. Silvers (2021) study investigates how parenting styles can have a major impact on the development of emotion regulation. Warmth and emotional sensitivity from the parents were examples of positive emotion activities that can lead to improved outcomes in adolescents' lives. Challenges in caregiving, such as abuse or neglect, can hinder the development of better emotion regulation skills. Adolescents' transition from depending on caregivers to managing their emotions on their own is greatly linked with the maturation of brain areas like the prefrontal cortex. The prefrontal cortex is usually engaged in cognitive regulation. These brain changes during adolescence make a particular emotion regulation technique, cognitive reappraisal, more successful. (Silvers, 2021).

## Theoretical Framework

### *Self-Determination theory*

Physical activity can be related to procrastination through self-determination theory, by an increase in motivation and self-esteem. Self-determination was described as the ability of individuals to make their own decisions (Deci, 1971). The self-determination hypothesis of human motivation and personality states that once a person's needs for competence, autonomy, and relatedness are satisfied, they can become self-determined. The concept of self-determination was created by psychologists Edward Deci and Richard Ryan, who first introduced it in their 1985 book Self-Determination and Intrinsic Motivation in Human Behavior. The self-determination hypothesis states that people can become self-determined after their needs for competence, autonomy, and connection are satisfied. According to self-determination theory, persons need to go through specific experiences in order to develop mentally (Ryan & Deci, 2020). First one was Autonomy. Autonomy means individuals must believe that they are in charge of their own actions and objectives. The ability to take action can shape the sense of self-determination of any person. Second one was competence. It implies that people must learn new skills and become proficient at a variety of tasks. When people think they have the skills needed to succeed, they are more likely to take actions that will help them achieve their objectives. The last one was connection or relatedness. Connection or relatedness was the ability to experience a sense of attachment and belonging to other people.

Duraiswamy et al. (2007) studied physical activity like yoga and found that it enhanced the quality of life and improved cognitive functioning of a person. The involvement in physical activity can raise sense of autonomy and competence, which are essential for self-determined motivation. Researches have proved that involvement in physical activity can lead to less

procrastination (Oram et al. 2021; Zhang et al.2024) as self-esteem increased (Zhuan et al., 2024; Ren et al., 2021). Specifically, physical activity enhances self-perceptions, which subsequently reduces procrastination behaviors (Ren et al., 2021). Self-determination theory suggests that fulfilling psychological needs can improve intrinsic motivation, leading to a high level of physical activity (Puigarnau, 2017).

Physical activity is also related to resilience through Self-Determination Theory (SDT). Luthar and Cicchetti (2000) explained resilience as the process of constructively adjusting to severe hardship. Adversity can include a variety of negative life experiences, such as difficulties adjusting, any sort of mental disorders, inadequate parenting, homelessness, traumatic events, any type of violence, conflict, natural disasters, and physical ailments etc. Many authors define resilience in multiple ways as Wald et al. (2006) defined resilience as a positive adaptation—that is, the capacity to preserve or recover mental health despite hardship and Bonanno (2008) defined resilience as a personal human quality that can emerge from a single, brief trauma. Resilience was greatly linked with hope, resourcefulness, social attachment, cognitive flexibility, intellectual functioning, emotion regulation, and positive emotions (Joseph & Linley, 2006). Previous research has established that involvement in physical activity enhances resilience by meeting basic psychological needs such as autonomy and competence, which in turn boosts self-efficacy (Li et al., 2024). This relationship is backed by results that suggest students with higher self-determined motivation are more involved in physical activity, leading to better psychological well-being (Bagøien et al., 2010). Furthermore, resilience can reduce procrastination. This is evident in by the study conducted, individuals  can maintain focus on everyday tasks, hence reducing the probability of procrastination. (The Oxford Handbook of Self-Determination Theory, 2023). The link between emotion regulation and academic procrastination can be better studied by the study

conducted by (Wei & Gaik 2023). The authors study the relationship between emotion regulation and academic procrastination among university students and conclude that theories like Self-determination theory and B.F. Skinner's reinforcement theory of Motivation can explain the relationship between the two variables. Although both theories have a different viewpoint on the sources of procrastination. The three components, competence, autonomy and relatedness, proved to influence the Emotion regulation skills, which include conscientiousness, self-control and adaptability. The authors study the relationship conclude that theories like SDT and B.F. Skinner's reinforcement theory of Motivation can explain the relationship. When people engage in physical activity, they feel more autonomous (in control), competent (capable), and related (connected to others) — these are the three basic needs in SDT. Fulfilling these needs increases intrinsic motivation, meaning people act because they want to, not because they have to. According to Skinner's Reinforcement Theory, when people feel rewarded (like feeling good or relaxed after exercise), they're more likely to repeat that behavior. Together, both theories explain that physical activity builds positive motivation and emotional balance. This improved motivation and emotional control help people regulate their emotions better and reduce negative habits like procrastination. Moreover, according to reinforcement theory. Positive reinforcement from ending the chores also enhanced the motivation level of an individual and helped him to deal with procrastination. That will eventually decrease the procrastination level (Wei & Gaik 2023).

There can be various factors that can lead to Procrastination. Academic procrastination among university students can be due to perfectionism (Ashraf et al., 2023). Fear of failure, difficulty in making decisions, laziness, and risk taking as the main four factors that caused procrastination were noted among a group of high school students of Turkey (Özer, 2009). Çapan, (2010) explored that the self-oriented perfectionist personality trait can lead to procrastination.

Furthermore, Laziness, lack of motivation, stress, internet addiction and task nature were also identified as major reasons for academic procrastination. (He, 2017). Moreover, Academic procrastination among students can also be due to task aversiveness, decision-making, and risks (Afzal & Jami, 2018). Task overload, lack of understanding of the materials given and procrastination habit can also be the reasons of procrastination (Setiyowati et al., 2020).

**Literature Review**

Physical activity is a widely studied topic in the literature, as Mahindru et al. (2023) analyse the effect of physical activity and exercise on mental health through a literature study and found that physical activity is greatly linked with mental health. In this study, physical exercise was shown reducing the depressive and anxiety symptoms and was also explored that yoga and physical activity has more positive effect in persons with schizophrenia. There is also found that consistent physical activity may also improve sleep quality. Regular physical activity with the combination of medical therapy can benefit patients with alcohol dependence syndrome. There is a lot of study has been done on the exploring the role of physical activity in health lifestyle and how it can help in managing mental health. There is many health benefit that individual an achieve by regular physical activity.

Researchers also studied the impact of regular physical activity on sleep quality and duration of sleep. For that purpose, researchers conducted a 12-week fitness training, and the result showed that regular physical activity improved the REM sleep (Ghrouz et al. 2019). Both moderate and active types of physical exercise can increase the sleep quality (Collier et al., 2014). Similarly, according to a meta-analysis of randomized controlled trials conducted on adults with mental health issues showed that physical exercise had a significant effect on sleep quality (Leder-man et al. 2018).

The significance of exercise in enhancing the quality of life for individuals with various conditions was highlighted by all of these findings. According to the World Health Organization, illnesses like depression play a significant role in the worldwide burden of disease. However, approximately 10% to 25% of those who are depressed really go to therapy. There could be many causes, such as a lack of funds, a shortage of qualified medical professionals in the area, or the social stigma attached to depression (Dinas et al., 2010). For those individuals with less severe forms of mental illness, such as mild level of depression and anxiety, regular physical exercise may become a crucial part of their treatment and management Mahindru et al. (2023).

***Relationship between Physical Activity and Procrastination***

Literature review has found that increased level of physical activity linked with reduced procrastination (Li et al.2022). For exploring the importance of physical activity in reducing mental health problems, Mitchell (2012) in his experimental study found that physical activity in a natural environment can lead to a greater decrease in mental health problems than doing any physical activity in any other environment. It was found that it can lower the risk of poor mental health by 6%. The relationship between physical activity and mental health was further explored by other researchers as well. Like Kim et al. (2012) also examined the relationship between mental health and physical activity and found that lower physical activity is linked with poorer mental health. They also investigated the best amount of physical activity for improving mental health. For that purpose, authors gathered a sample of 7674 adult respondents and result found that participant who has better mental health were more physically active. In this research it was suggested that physical activity of 2.5–7.5 weekly hours is better for improving the mental health while highlighting

Recent studies have indicated that physical activity or exercise can also improve symptoms of depression and overall mood in individuals. According to one study's findings, exercise can help in children and adolescents with their anxiety and depression symptoms (Larun et al., 2006). A similar argument is made by Jayakody et al., (2013) that argued that exercise can serve as a a supplementary treatment for anxiety disorders. For that purpose, researchers conducted randomized controlled trials that examined exercise therapy for anxiety disorders.

Moreover, there was also shown in several studies that physical activity can enhanced self-esteem, cognitive functioning, mood and quality of life of a person. (Biddle, 2016), Researches also had proved that individuals who tend to exercise regularly produce more neurochemical like opioids and endocannabinoids that causes pleasure, sleepiness, and release in pain (Godse et al., 2014). Additionally, attention span, focus, memory and decision-making skills can be enhanced for up to two hours if a person includes exercise for some amount of time in his daily routine. (Hallam et al., 2018).

A growing body of research has demonstrated that physical activity not only can enhance mental health but also can enhance physical well-being. For example, Physical activity can signicantly reduce cardiovascular disease (Varambally & Bangalore, 2012). If physical activity is incorporated in daily routine many chronic diseases can be reduced by 20%-30%. Similarly, Cabral et al., (2011) study showed that even a small amount of physical exercise in a daily routine can help to get various health benefits. In a similar way, Iqbal (2023) conducted more research on physical activity and found that incorporating regular exercise into daily routines can enhance muscle strength and improve sleep. A minimum of 150 minutes of moderate aerobic activity or 75 minutes of strenuous aerobic activity, or a mix of both, should be performed each week, according to the recommendations. It was suggested that at least 300 minutes per week be done for the

increased health benefits. Physical activity can also stimulate various brain chemicals that help a person to feel relaxed and happier. (Iqbal, 2023). Moreover, physical activity also proved to enhanced the working of the hypothalamus-pituitary-adrenal (HPA) axis, lowering the cortisol secretion and balancing of leptin and ghrelin (Telles et al., 2018).

Jabeen et al. (2018) found that 69% of subjects reported as physically inactive while conducting research in Lahore university. Furthermore, Physical activity a showed significant positive relationship with life satisfaction, and self-efficacy (Deng et al., 2023) body self-esteem and overall self-esteem and negatively correlated with procrastination (Zhuan et al., 2024). Procrastination has negative impact on daily life such as depression ((Moljord et al., 2014) poor academic performance (Kim & Seo, 2015; Ren et al., 2023) psychological distress (Khan & Hassandra, 2016) lower self-esteem (Athulya et al., 2016; Duru & Balkis, 2017; Zhuan et al., 2024) and lower self-control (Özer & Ferrari, 2020).

Procrastination can be due to various reasons for example higher levels of anxiety, depression, and stress (Rozental et al., 2022). Procrastination is a self-regulation failure as well as a time management problem, and it is frequently associated with negative emotions including stress, guilt, and low self-esteem. (Ferrari et al., 2017). Van Eerde and Klingslieck (2018) reported that procrastination can be reduced with the help of therapies like cognitive behavioral therapy (CBT). Studies have shown a reduction of light/mild physical activity post COVID-19 as compared to pre-COVID-19 pandemic. (López-Valenciano et al., 2021). In accordance to Ferrari (2018) 20 % of adults were defined as chronic procrastinators. Jauhar et al. (2024) study shows that procrastination is a significant positive indicator of academic stress among university students. Moreover, male students showed the greater level of stress and procrastination as compared to females. Moljord et al. (2014) noted that high physical activity is linked with lower symptoms of

depression in girls. Zhuan et al. (2024) study found the significant relationship between physical activity and procrastination. Previous studies also showed that higher level of physical activity was linked with reduced intensities of procrastination (Codina et al., 2020; Shi et al., 2021). Similarly, Batool et al. (2017) study showed that there was significant negative relationship between self-esteem and procrastination.

***Relationship of Physical Activity with Resilience***

Resilience is usually a capability to recover from tough circumstances Sahi (2016). Resilience negatively relates with the stress, the students who are more resilient experienced less stress (Zahra & Riaz, 2018) positively relates with high activity (Matzka et al., 2016). Studies has shown high level of resilience is strongly associated with lower levels of psychological distress (Matzka et al., 2016; Anser et al., 2021) and significantly positively correlated with life satisfaction (Deng et al., 2023). Resilience can develop in an individual when he can cope with negative life experience (Rutter, 2012) There was also strong evidence that early caregivers who are sensitive and supportive can boost resilience in infancy and childhood. (Gunnar & Fisher, 2006). Resilience was fostered by higher cognitive ability, psychological hardiness, self-esteem, social support, and a sense of hope and control over life. (Hornor, 2017)

Findings of one study also indicated that harsh environment in early year of life can affect the child' developing brain structure. (Cicchetti and Curtis, 2006). A person's ability to manage negative emotions and demonstrate resilience in the face of adversity can be impacted by changes in the brain and other biological processes. Similarly, an EEG study of children between the ages of 6 and 12 revealed a strong correlation between EEG activity and maltreatment status and resilience. (Curtis & Cicchetti, 2007). The findings indicated that there was clearly distinguish between resilient and non-resilient children as indicating by EEG asymmetry across central

cortical regions. There was greater left hemisphere activity among those children who were resilient. Moreover Hornor (2017) also study on how both genetic and environmental factors can influence on resilience, and result showed that stress can affect brain function and behavior.

Multiple longitudinal studies have investigated that how individual transition from childhood or adolescence impact on their life and resilience. The findings of these studies clearly showed that a more successful transition to adulthood and more resilient functioning. The smooth and successful transition can be influenced by a multiple but important factors such as positive peer, family relationships, supportive adults, self-discipline, and cognitive ability. (Burt & Paysnick, 2012), In addition to, resilience in children and youth can also be impacted by the parenting, family functionality, and attachment pattern, (Sapienza & Masten, 2011). Moreover, resilience can also be developed by cognitive processes, personality traits, and active coping mechanisms (Charney, 2004). Furthermore, Wu et al. (2013) also found multiple factors that can influence resilience and found that there are many factors like genetic, developmental, psycho-social, and neurochemical factors may contribute to resilience. For example, specific genes, such as hypothalamic-pituitary-adrenal (HPA) axis and neurotransmitter systems can influence stress responses and resilience. Childhood environment, Psychosocial factors like cognitive reappraisal (reframing negative thoughts), and active coping strategies, can also enhance resilience. Resilience is moreover can also be improved by higher cognitive ability, psychological hardiness, self-esteem, social support, hope and control over life. (Hornor, 2017).

Physical activity has positive relationship with resilience (Moljord et al., 2014; Román-Mata et al., 2020). Similarly, Li et al. (2024) in his study also noted that physical activity was significantly linked with high level of resilience. Moreover, Deng et al. (2023) also suggested that physical activity exhibit significant positive relationship with resilience. In some recent researches

resilience has been shown as the significant mediator in the relationship between PA and mental well-being (Ho et al., 2015), also mediated 27.44% of the relationship between physical activity and life satisfaction (Deng et al., 2023). This indicate that higher level of physical activity linked to enhanced life satisfaction partly through increased resilience.

Moreover, research by Seçer and Yildizhan (2020) also found that physical activity had a low but positive association with psychological resilience. Similarly, the study by Ueno et al. (2024) also explored the relationship between physical activity and resilience on the Japanese's individuals and the study found that there is significant positive relationship between physical activity and resilience. Furthermore, resilience can include challenges, self-commitment and control. Physical activity or exercises can improve resilience by strengthening or enhancing person brain regions and large-scale neural circuits. MRI results also suggest that different types of physical activities help resilience by improving the structure and function of the prefrontal cortex. (Belcher et al., 2020). Furthermore, Xu et al. (2021) in his study found that physical activity can considerably enhance resilience among students. Study have shown that there is a positive association between the physical activity and resilience. For example, involvement in physical activity can enhance competence need satisfaction by 20%, which is crucial for increasing resilience. Moreover, physical activity also enhances emotion regulation that can help individuals to cope with hardship more efficiently. Carriedo et al. (2020) conclude that persons who consistently engaged in vigorous PA showed improved resilience in context of better optimism, better self-efficacy and stronger locus of control.

Several studies have shown that physical activity can significantly enhanced resilience Ozkara et al. (2016) study has shown the positive impact of physical activity on resilience (r = .598). The intensity of physical activity also plays an important role in enhancing resilience in

college students. For example, Dunston et al., (2020) studied different level of physical activity on college-level students and found that only vigorous level of physical activity significantly enhance the resilience, where mild and moderate levels of physical activity does not significantly correlate with students' resilience ability. Similarly, there was another study that also show similar findings. The study demonstrated that the person can enhance the ability of resilience by actively taking part in good amount of physical activity (Zhang et al., 2022). Lastly the study by (Qiu et al. 2025) also shows that physical activity significantly and positively leads to more resilience.

***Relationship between Physical Activity and Emotion Regulation***

Nozaki and Mikolajczak., (2020) defined emotion regulation as an activity or skill that is performed with the intention of changing emotions. Emotion regulation can be defined as how individuals respond to any external or environmental challenges by modifying the intensity of their emotions (Aldao & Plate, 2018). Recent studies have shown that emotion regulation strategies are positively related to well-being (Morrish et al., 2017; Finkelstein-Fox et al., 2018; Kraiss et al., 2020) and self-efficacy (Supervía & Robres, 2021). Similarly, use of emotion strategies can impact mental and social well-being (Chervonsky & Hunt, 2018). Regular exercise and emotional well-being are also frequently linked by emotion management (Bernstein & McNally, 2018). On the other hand, maladaptive emotion regulation can lead to a higher level of anxiety when it is linked with a low level of mindfulness activity. (Malik & Perveen, 2021). Moreover, emotion regulation strategies were negatively related to academic burnout (Mahasneh et al., 2022).

Physical activity has a positive relationship with emotion regulation (Román-Mata et al., 2020). Zafar et al. (2020) study described that individuals who struggle to manage their emotions are more prone to face depression, anxiety or other behavioural issues. One study found that females use more emotion regulation strategies compared to males when they experienced sadness,

anxiety and anger (Sanchis-Sanchis et al., 2020). Additionally, Kozubal et al., (2023) findings suggested that men may use more emotion regulation strategies than women in a difficult situation. Individual who suppresses their emotions tend to experience more anxiety. Moreover, female medical students experience higher anxiety than male students (Chervonsky & Hunt, 2018). Some studies also showed that expressive suppression of emotion regulation, significantly moderates the relationship between several aspects of impulsivity and procrastination (Wypych et al., 2018), whereas Kozubal et al. (2023) study shows that intensity of emotion determines how individuals make decisions in a difficult and complex situation.

Some individual usually suppresses their emotions. These sorts of patterns can lead to loneliness in these individuals. (Preece et al., 2021). Similarly, maladaptive emotion regulation can lead to poor sleep quality and depression symptoms (O'Leary et al., 2016). The study found that using adaptive emotion regulation strategies lead to fewer depressive and anxiety symptoms, while relying on maladaptive strategies associated with depression and anxiety symptoms. (Schäfer et al., 2017). Additionally, depression can also occur when an individual faces difficulty with the regulation of their positive emotions (Vanderlind et al., 2020). Wu et al. (2022) study shows that cognitive reappraisal significantly increases with higher physical activity. This suggests that those who engage in more PA are better at cognitively reframing their emotional experiences.

The literature review explained that emotion regulation and physical activity were positively correlated, indicating that students who engage in greater physical activity also have greater emotion regulation abilities. For example, according to one study students who engage in physical activity were more likely to employ constructive reinterpretation techniques to control their emotions. Additionally, physical activity and expression inhibition were also positively correlated, indicating that they are somewhat more adept at controlling their emotion expression.

(Sheng et al., 2024). There is also a positive impact of physical activity on emotion regulation and mental well-being (Martinez et al., 2024; Zhao et al., 2024). Moreover, Al-Wardat et al. (2024) study found that higher usage of expressive repression was linked to more anxiety symptoms. The group with the highest levels of physical activity reported fewer symptoms of anxiety and depression, even though there was no significant relationship between physical activity levels and Emotion regulation in that particular study.

Adaptive emotion regulation strategies have also been proven to mediate the effect between physical activity and mental health (Sánchez-Núñez et al., 2023). Physical exercises can improve emotion regulation ability (Zhang et al., 2019; Liu et al., 2022) and help to cope with difficult situations. Exercise was effective in regulating anger and anxiousness after a stressful event (Edwards et al., 2017). Physical activity tends to lead to fewer negative feelings in adolescents with anorexia nervosa. (Kolar et al., 2019) Regulation and control of emotions and empathy improved over time (Bahmani et al., 2019).

***Relationship between Resilience and Procrastination***

There is a lot of studies that explore the relationship between resilience and procrastination and have found that resilience **is** negatively correlated with procrastination. It means that higher resilience significantly reduces the procrastination level. For example, Zhang et al., (2024) explored the relationship between resilience and procrastination and found that resilience was negatively correlated with procrastination. Similarly, one another study also showed that resilience lowers procrastination (Öksüz & Güven, 2014). There were a lot of research conducted on students to understand the impact of resilience on their procrastination level. For example, Ko and Chang (2018) studied the resilience of college students and found that students who score high on resilience have a lower tendency toward procrastination. The College students who had greater

level of resilience were less likely to procrastinate about their career (Shin and Kelly, 2015). Moreover, Anwar et al. (2025) conducted a cross-sectional study on medical students of Pakistan, and the results were similar to earlier studies, resilience was found significantly negatively corelated with academic procrastination.

***Relationship between Emotion Regulation and Procrastination***

Emotion regulation is greatly linked with satisfaction and personal accomplishment. As in a study of emotion regulation abilities, Brackett et al. (2010) found that Emotion regulation ability was positively associated with increased personal accomplishment and job satisfaction among individuals. Additionally, it was proposed that teachers who possess greater emotion regulation skills would be better at producing positive emotions through various techniques such as cognitive reappraisal and self-talk. It can assist them in controlling their everyday stress and unpleasant emotional situations. In one study, DeArmond et al. (2014) found the impact of increasing workload on procrastination. Emotion regulation skills can significantly lower the procrastination level in an individual. Procrastinators usually tend to regulate the perceived stress and emotions by postponing or avoiding tasks. A lack of difficulty in managing negative emotions are likely to lead to more procrastination.

Wilms et al. (2020) in their study investigate how individuals regulate their emotions that emerge during negative life experiences. His study mentioned five strategies, like active coping, which involves taking actions to improve the negative life situation, the second one was distraction, which involve shifting attention away from the negative emotions, and the third was rumination. Rumination refers to any obsessive focus on negative thoughts and feelings about the emotions or situation. The fourth one was cognitive reappraisal. It is a productive strategy in which a person changes their perspective for life events. The last emotion regulation strategy was

expressive suppression, controlling how to express emotions. Authors also mentioned the predictors for emotion regulation, such as emotion regulation goals. Goals such as improving one's mood or maintaining social harmony to avoid conflict can influence the choice of emotion regulation strategy. The other one is situational factors. It involves emotion intensity, perceived control over the situation, and the likelihood of the situation recurring, which also form the basis for emotion regulation strategy selection. (Wilms et al., 2020).

Sanchis-Sanchis et al. (2020) conducted a study to explore how different age groups and gender showed differences in emotion regulation strategies. The results suggested that children and pre-adolescents obtained lower scores in the emotion regulation strategies than the teenage group. The authors also find that girls use more emotion regulation strategies when experiencing any distressing life event than boys. however, girls tended to have higher scores than boys when they were younger and lower scores than boys when they were older on emotion regulation scale. In a similar way, Zimmermann and Iwanski (2014) investigated and discovered that adolescents between the ages of 13 and 15 exhibit fewer adaptive regulation methods than those who are 11 or older. They discovered that, in contrast to early or late adolescence, adolescents frequently exhibit a decline in the usage of strategies in mid-adolescence (13–15 years). Other researchers also found that the mid-adolescent age group had less use of suppression and cognitive re-evaluation abilities as compared to younger age groups (Gullone et al., 2009). It was also shown in the study that problems in adolescence can be due to cognitive reevaluation and avoidance. Cognitive reevaluation was, however negatively related, and avoidance was positively related among the younger group.

Paley and Hajal (2022) study examined how family systems develop emotion regulation in childhood, adolescence, and adulthood. The author first mentioned that a secure and safe base

from caregiver help children to learn to regulate their emotions. Sociocultural norms and socio-political factors can also influence how families approach emotion regulation. Emotion regulation skills usually improve radically during the adolescence period (Silvers, 2020). Tamir et al. (2020) study emphasised that emotion regulation is a goal-directed activity and a motivated process. Emotion regulation strategies like cognitive reappraisal and emotion goals impact each other. The study suggested that difficulty in goal setting or goal striving can lead to maladjusted Emotion regulation.

Palmieri et al. (2022) article explored the role of Emotion regulation in different therapies like psychodynamic therapy and cognitive-behavioral therapy. This study explored the role of Emotion regulation as a central theme in therapeutic change. By regulating the emotions intrapersonal (within the individual) and interpersonally (within relationships) therapy result can be enhanced. As Psychodynamic Therapy (PDT) aims on uncovering unconscious and past experiences emotion regulation work on defence mechanisms and attachment patterns to regulate emotion responses. Also, as Cognitive-Behavioral Therapy (CBT) focuses to modify maladaptive thoughts and behaviors that lead to negative emotions. Emotion regulation in CBT involves strategies like reappraisal and mindfulness to foster emotion adaptability.

Better emotion regulation skills help people manage their negative emotions, reducing the chance of procrastination. (Eckert et al., 2016: Bytamar et al., 2020). Similarly, Schuenemann et al. (2022) study also found that development of general emotion regulation skills significantly reduced the procrastination in the behavior. Moreover Anwar et al. (2025) study expressive suppression that is sub-scale of emotion regulation on medical students and found that expressive suppression is significantly positively related with academic procrastination**.** -A study conducted by Chang (2020) showed that cognitive reappraisal a subscale of emotion regulation has significant

negative relationship with emotion exhaustion, de-personalization and inefficacy whereas expressive suppression, another subscale of emotion regulation, has positive impact on emotional exhaustion, depersonalization, inefficacy.

In conclusion to Herzog-Krzywoszanska et al. (2024) study also indicates that procrastination and physical activity are significantly influenced by Emotion self-regulation. Increased tendencies for both general and particular forms of procrastination linked to engaging in physically active activities are one indirect effect of lower levels of self-regulation. Hence the above findings demonstrated that there is a correlation between lower levels of physical activity and emotional self-regulation. In particular, those who struggled with emotion self-control were more likely to procrastinate in general, which in turn led to a larger tendency to postpone or delay from physically demanding activities. Consequently, these people were less likely to regularly exercise or training.

When the chores and tasks are delayed, it causes stress which is why Procrastination-Health Model proposes that procrastination negatively impacts mental health by causing stress. (Sirois, 2006). Procrastination is positively correlated with perceived stress in adolescents (Reinecke et al., 2018) and university students (Tice & Baumeister, 1997) This stress can lead to emotion dysregulation. Emotion regulation is crucial because it can help person manage their emotions successfully, stopping stress from growing and reducing procrastination behaviors. Sirois & Pychyl (2013) study explored the reason why people procrastinate and explained temporal mood-regulation perspective, which explored that the experience of negative Emotion states and difficulty in regulating them causes procrastinating behaviour.

According to some recent research, people who struggle with emotional self-regulation are likely to procrastinate more, especially when it comes to physical activity. As a result, they exercise less frequently each week and become less fit overall. A relationship between emotion self-

regulation and physical inactivity through procrastination is confirmed by Herzog-Krzywoszanska et al.'s (2024) study, which showed that emotion dysregulation increases procrastination, which then causes delays or avoidance of physical activity. As the emotion regulation described as people's capacity to successfully regulate and control their emotions. This may involve cognitive reappraisal, expressive suppression. Effective emotion regulation enables individuals to respond adaptively to stimuli and situations, which can result in enhanced health. (Polizzi & Lynn, 2021). It is a process in which we experience and express emotions effectively (Thompson et al., 2008). Essentially, these regulation strategies help to maintain balance in a daily routine (McRae & Gross, 2020). Effective emotion regulation strategies increase resilience and mental health, however difficulties with regulating one's own emotions can lead to various challenges (Iwakabe et al., 2023).

Moreover, Garzón-Umerenkova et al., (2018) research found that self-regulating ability has a positive impact on health and a negative impact on procrastination behavior. Moreover, Miao et al., (2024) study work on "intention–behaviour gap," where individuals intending to be active still fail to act due to procrastination tendencies. The temporal-affective self-regulation resource model was introduced, which demonstrates how any emotion state, especially a negative one, can change the intention and lead to procrastination. All the above observations highlight how important it is to incorporate techniques for emotion regulation to increase physical activity and decrease procrastination in order to improve long-term health results.

**Rationale**

As Procrastination is a predominant issue among university students, it can lead to poor results in academic grades, anxiety or stress, and struggling with organization and time. (Abbasi & Alghamdi., 2015). Physical activity has been shown to improve mental health by lowering stress

and anxiety (Saxena et al.,2005), which can affect procrastination. ((Ko & Chang, 2019). Although many previous studies have demonstrated the relationship between physical activity and procrastination (Codina et al., 2020; Ren et al., 2021; Zhuan et al., 2024), there is limited literature that focuses on the relationship between physical activity and procrastination, as well as the underlying mechanisms that can assist in comprehending this relationship in Pakistan.

As some literatures review exists that explain the relationship of physical activity with resilience (Ozkara et al., 2016, Xu et al., 2021) emotion regulation (Kraiss et al., 2020, Liu et al., 2022) and procrastination is also studied in relations with resilience (Zhang et al., 2024, Ko and Chang., 2019) and with the emotion regulation skills (Bytamar et al., 2020, Schuenemann et al. (2022) indicating the potential opportunity to explore the underlying mechanism behind the relationship between physical activity and procrastination. In order to better understand the pathways and conditional effects by which physical activity promotes procrastination, the current study primarily focused on investigating the mediational role of resilience and the role of emotion regulation as a moderator.

The present study aims to fill the gap in already existing literature with references to students of Pakistan. The present study will explore the relationship between physical activity, procrastination, resilience and emotion regulation among university students in Pakistan. Understanding this association could offer insight into developing an inclusive intervention. It can raise awareness about procrastination and highlight the importance of physical activity among university students in Pakistan. The purpose of the study is to address persistent psychological and behavioural issues that can disturb students' well-being and academic life. This study is important because procrastination is not only a prevalent problem but is also related to several disadvantages, including a decline in academic performance and productivity in career and low

well-being. By exploring how physical activity can impact procrastination, this research can be an addition to a growing literature on behavioural interventions that improve productivity and mental health of students. The conclusion could be mostly important for educators or mental health professionals aiming to design plans or programs that motivate students to engage in physical activity to improve resilience and emotion regulation and to reduce procrastination. Analyzing how the variables like emotion regulation and resilience within the perspective of physical activity could help to understand how physical and psychological factors both can contribute in influencing behaviour of university students.

**Objectives**

The study aims:

1. To study the relationship between physical activity, procrastination, resilience, and emotion regulation among university students.
2. To examine the effect of physical activity on procrastination among university students
3. To examine the mediating role of resilience in the relationship between physical activity and procrastination among university students.
4. To examine the moderating role of emotion regulation in the relationship between physical activity and procrastination among university students.
5. To investigate the effect of demographic factors like age, gender, and education level on physical activity, procrastination, resilience, and emotion regulation among university students.

**Hypotheses**

1. There is a positive relationship of physical activity, resilience, and emotion regulation among university students.
2. Physical activity negatively predicts procrastination among university students.
3. Resilience mediates the relationship between physical activity and procrastination among university students.
4. Emotion regulation moderates the relationship between physical activity and procrastination among university students.
5. Male university students have higher physical activity, procrastination, resilience, and emotion regulation than female university students.
6. The students studying in BS degree program have higher levels of procrastination and Emotion regulation as compared to students studying in MS degree program.
7. The younger university students (18–22 years) have a higher level of procrastination than older students (23–27 years).

**Conceptual Framework**

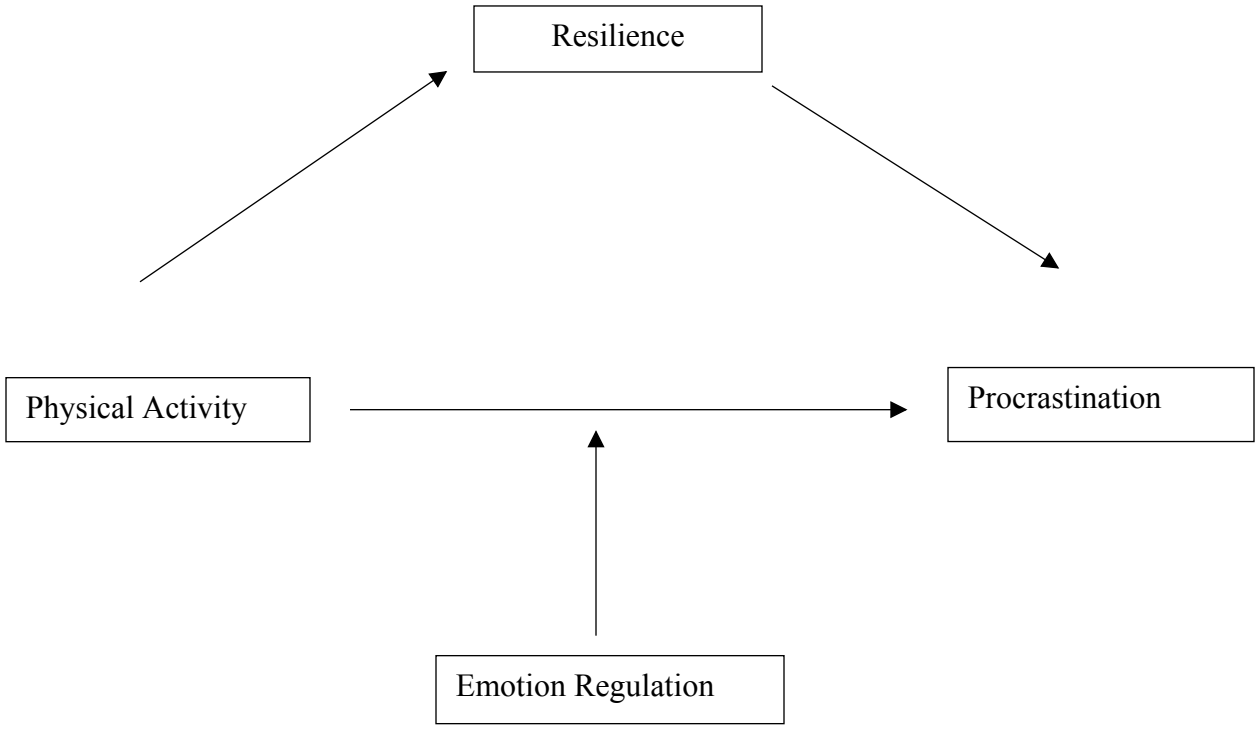


**Figure 1:** *Conceptual framework showing the mediation role of resilience and the moderation role of emotion regulation between the relationship of physical activity and procrastination among university students*

# Chapter 2

## Method

### Research Design

The study used a correlational research method, a research approach to investigate the statistical relationship between two or more variables without manipulating them experimentally**.** The study was based on a quantitative survey method**.**

### Sample

The sample was comprised of 300 participants (125 males and 175 females) aged 18 to 27 undergraduate and graduate students taken from different public and private universities of Rawalpindi and Islamabad, including International Islamic University, Riphah International University, Bahria University and Air University. A purposive sampling technique has been used for data collection of the present study.

#### *Inclusion Criteria*

Participants having an age range between 18 to 27 years enrolled in universities were included in this study.

#### *Exclusion Criteria*

Students with any physical disability or suffering from any mental illness have been excluded from the study

### Operational Definition

### *Physical Activity*

World Health Organization (2024) defined physical activity as any type of movement of the body that requires energy. It usually includes all the activities or movement, including relaxation time, movement to go from one place to another, or as part of an individual's work or home tasks. For the present study, physical activity was measured in terms of scores on the International Physical Activity Questionnaire (Craig et al., 2003). High and low levels of score interpretation indicate high and low levels of physical activity of an individual.

### *Procrastination*

Rakes & Dunn (2010) defined Procrastination as the purposeful delaying of necessary chores or tasks. For the present study, procrastination has been measured in terms of high scores on the General Procrastination Scale (Lodha et., 2016).

### *Resilience*

Sahi (2016) defined resilience as a capability to recover from a difficult and tough situation and as a constructive and positive personality trait that improves an individual and controls the harmful effects of stressful situations. In the present study, an individual's score on the Brief Resilience Scale (BRS) indicates the resilience of the individual.

### *Emotion regulation*

Emotion regulation is described as a person's ability to control and govern their emotions (Gross & John, 2003). In the present study, individuals' scores on the emotion regulation questionnaire (Gross & John, 2003) indicate their ability of emotion regulation.

## Instruments

### *Demographic Sheet*

The demographic sheet comprises gender, age, education level, family system, residence, marital status, CGPA, department and faculty, university, family income, father and mother education, father and mother occupation, number of siblings, birth order, hostelite/ Day-scholar status of university students.

### *International Physical Activity Questionnaire (IPAQ)*

The International Physical Activity Questionnaire (IPAQ) is a self-report measure developed by (Craig et al., 2003) to assess physical activity levels. For the present study, the short form of IPAQ was used. The reliability of IPAQ-Short Form is 0.8. The IPAQ-Short Form consists of 12 items. The questionnaire captures information about the frequency, duration, and intensity of physical activity performed over the past 7 days. The Data obtained from the IPAQ scale was transformed into a total score based on the Metabolic Equivalent of Task (MET) (Craig et al., 2003). An MET describes the energy used during different sorts of physical activities. The calculations performed for the continuous scores of the IPAQ scale were:

Walking MET-minutes/week = 3.3 * walking minutes * walking days

Moderate MET-minutes/week = 4.0 * moderate intensity activity minutes * moderate days Vigorous MET-minutes/week = 8.0 * vigorous intensity activity minutes * vigorous-intensity days

Total physical activity = Walking + Moderate + Vigorous MET-minutes/week scores.

The data gathered from the IPAQ were also categorized into three groups (Craig et al., 2003). The “high group”, also labelled as “03”, included the participants who did 1,500 MET-minutes/week of physical activity (vigorous) for at least 3 days or the participants who achieved a minimum of 3,000 MET-minutes of physical activity (combination of walking, moderate, or vigorous-intensity) per week for 7 or more days. The “moderate group”, also labelled as “02”, included the participants who did vigorous-intensity activities for 3 or more days only (20 min per session) or moderate intensity activity only or walking for 5 or more only (30 min per session) or the participants who achieved a minimum of 600 MET-minutes of physical activity (combination of walking, moderate, or vigorous-intensity) per week for 5 or more days. The “low group”, also labelled as “01” included the participant who did not fulfil the criteria of the above groups.

***General Procrastination Scale (GPS)***

The General Procrastination Scale (GPS) developed by Lodha et. (2016). With 23 items in total, the scale measures procrastination in 4 domains- academic, workplace, medical and civic responsibilities related to procrastination. The reliability score of the procrastination scale is 0.71. All items are required to be rated on a 5-point Likert scale ranging from 1 to 5.

***Brief Resilience Scale (BRS)***

The Brief Resilience Scale (BRS) was developed by Smith et al. (2008) to specifically measure an individual's ability to "bounce back" or recover from stress, rather than focusing on other factors like coping strategies or resources. The BRS consists of 6 items that assess the ability to recover from stress, with a focus on the speed and effectiveness of one's recovery. Participants rate their agreement with each item on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability score of the Brief Resilience Scale is 0.86.

### *Emotion Regulation Questionnaire (ERQ)*

The Emotion Regulation Questionnaire (ERQ) was developed by Gross and John (2003) to assess individuals' habitual use of two Emotion regulation strategies: Cognitive Reappraisal and Expressive Suppression. The ERQ consists of 10 items, where participants rate their agreement with statements on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The reliability of the ERQ scale is 0.69.

## Ethical Consideration

Ethical approval has been obtained from the Ethical Review Board of the Department of Psychology at the International Islamic University, Islamabad IIUI). Furthermore, informed consent was also obtained from the participants, and the privacy and confidentiality of related matters have been ensured.

## Procedure

With the permission of concerned authorities' university sector students were approached by the researcher. After the brief introduction about the study, informed consent has been obtained from the respondents. Then the data has been collected by using Emotion Regulation Questionnaire (Gross and John., 2003), General Procrastination Scale (Lodha et., 2016), IPAQ (Craig et al., 2003) and Brief Resilience Scale (Smith et al., 2008). During scale administration, each and every confusion of the participants has been made clear. Moreover, participants were also requested to be honest while providing answers and at the end, they were thanked for their cooperation. For results analysis SPSS was employed for descriptive analysis, Linear Regression Analysis and t-test. For moderation and mediation analyses PROCESS v4.2 by Hyes was utilized. For the mediation process model 4 was used and for moderation process model 1 was used.

# Chapter 3

## Results

**Table 1**

*Frequencies and percentage of demographic variable of study (N=300)*

| Variable | Category | *F* | % |
|---|---|---|---|
| Gender | Male | 125 | 41.7 |
| | Female | 175 | 58.3 |
| Family system | Nuclear | 184 | 61.3 |
| | Joint | 116 | 38.7 |
| Age group | 18-22 | 200 | 70.0 |
| | 23-27 | 100 | 30.0 |
| Marital status | Single | 279 | 93.0 |
| | Married | 21 | 7.0 |
| Residence | Urban | 230 | 76.7 |
| | Rural | 70 | 23.3 |
| University | Public | 90 | 30 |
| | Private | 210 | 70 |
| Socioeconomic status | Middle class | 144 | 48.0 |
| | Upper class | 156 | 52.0 |
| Education | BS | 200 | 66.7 |
| | MS | 100 | 33.3 |
| CGPA | 2-.5-3.0 | 122 | 40.7 |

| | | | |
|---|---|---|---|
| | 3.01-3.5 | 88 | 29.3 |
| | 3.51-4.0 | 90 | 30.0 |
| Degree Program/Dept | FSS | 63 | 21.0 |
| | Allied Health Sciences | 130 | 43.3 |
| | Science | 31 | 10.3 |
| | Engineering | 25 | 8.3 |
| | Computer & IT | 51 | 17.0 |
| Day scholar/Hostelite | Day scholar | 198 | 66.0 |
| | Hostelites | 102 | 34.0 |
| Father education | No education/ Primary | 29 | 9.7 |
| | Matric/Intermediate | 127 | 42.3 |
| | Bachelor/Master | 144 | 48.0 |
| Mother education | No education/ primary | 65 | 21.7 |
| | Matric/Intermediate | 125 | 41.7 |
| | Bachelors/Master | 110 | 36.7 |
| Father occupation | Government job | 136 | 45.3 |
| | Private | 46 | 15.3 |
| | Self-employed | 118 | 39.3 |
| Mother occupation | Housewives | 255 | 85.0 |
| | Employed | 45 | 15.0 |
| No of Sibling | Only child | 23 | 7.7 |
| | 1-2 sibling | 43 | 14.3 |

| | | | |
|---|---|---|---|
| | 3 or more | 234 | 78.0 |
| Birth order | First born | 100 | 33.3 |
| | Middle | 67 | 22.3 |
| | Last born | 133 | 44.3 |

*Note.* f= Frequency, %= Percentage

Above table shows frequency distribution and percentages of all demographic variables in the present study. The sample considered of 300 university students. There are 41.7% students's male and 58.3% female. Participants have different level of education. 66.7 % participants are from BS level; 33.3 % participants are from MS in the sample. The participants of age group 18-22 are 70% and participants of age group 23-27 are 30%. Furthermore, 93 % participant are single 7% are single. Above mentioned table shows that 76.7 % participants are from urban background while 23.3 % participant belong from rural background. The students studying in public universities are 30% whereas 70% students are studying in private universities. Moreover, 48% students belong from middle class and 52% from upper class. The above table also shows that 40.7% students' CGPA lies in range of 2-.5-3.0, whereas 29.3% scored CGPA from range 3.01-3.5 and 30 % CGPA lies between 3.51-4.0. Furthermore, majority of the respondent are from Allied Health Sciences deg i.e. 43.3 % whereas 21% are from Social Sciences, 43.3 10 % are from Sciences, 8.3 % are from Engineering, 17.0% from Computer & IT. Moreover 66% respondents are Day scholar while 34% are Hostelite.

The above table shows that 48% participants reported that their father has master's degree, 42.3% shows Matric/Intermediate level of degree while 9.7 % report no education or Primary level education. Whereas 41.7% of the respondent report that their mother receives Matric/Intermediate level of education, 36.7% respondent report that mother receives Master degree while 21.7%

report no education/ primary level education. Moreover, majority of participants report their father occupation as government job i.e. 45.3% where 15.3% as Private job and 39.3% Self-employed. Furthermore Moreover, majority of participants report their mother occupation as housewife i.e. 85 % while 15% are Employed. The table also shows that the participants who are only child are 7.7%, whereas who has 1-2 sibling are 14.3% and who have 3 or more are 78%. The participant who are first born are 33.3%, whereas middle is 22.3 % and last born are 44.3%. Majority of the participant belong nuclear family system i.e 61.3% whereas 38.7% are living in joint family system.

**Table 2**

*Descriptive Statistics and Reliability coefficient (α) for scales of Physical Activity, Procrastination, Emotion regulation and Resilience among university students (N=300)*

| Scales | k | α | M(SD) | Range | | Skew | Kurt |
|---|---|---|---|---|---|---|---|
| | | | | Potential | Actual | | |
| PA | 7 | .63 | 1543.36 (1314.65) | 0-19,278 | 0-5466.0 | .68 | -.28 |
| Procrastination | 23 | .69 | 64.32 (10.24) | 23- 115 | 38-102 | .03 | .17 |
| Resilience | 6 | .59 | 18.11(3.19) | 6-30 | 10-28 | .13 | .20 |
| CR | 6 | .73 | 28.68 (6.88) | 6-42 | 6-42 | -.72 | .20 |
| ES | 4 | .63 | 18.66 (5.03) | 4-28 | 4-28 | -.49 | -.35 |

*Note.* PA=Physical activity, ES=Expressive Suppression, CR= Cognitive Reappraisal

Table 2 shows descriptive statistics for scales used in this study. The Cronbach's Alpha values of all variables are in an acceptable range. The alpha reliability coefficient for Physical activity is .63, for Procrastination it is .69, and for Resilience is .59. The alpha reliability coefficient for the Cognitive reappraisal subscale of emotion regulation is .73, and for the expressive suppression subscale of Emotion regulation is .63. Alpha reliability coefficient shows satisfactory reliability. For all of the scales of the present study, the values of skewness and kurtosis lie in the normal range (-1 to +1), showing normal distribution of data.

**Table 3**

*Coefficient Matrix for Physical activity, Procrastination, Emotion regulation and Resilience among university students (N=300)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Physical activity | - | -.15** | .11* | .07 | .09 |
| Procrastination | | - | -.19*** | -.06 | .02 |
| Resilience | | | - | .11 | -.09 |
| Cognitive reappraisal | | | | - | .53* |
| Expressive suppression | | | | | - |

*Note*. **p < 0.01, *p<0.05, ***p<0.01

Table 3 shows the Pearson Product Moment Correlation of Physical activity, Procrastination, Emotion regulation and Resilience. It describes that Physical activity is significantly negatively correlated with Procrastination (r =-.15, p<.01). The p value is <0.01 which mean relationship is statistically significant. So, we can say that increase in physical activity cause decrease in Procrastination level. Furthermore, result show that physical activity is significantly positively related with resilience (r=.11, p<.01). However, there is positive but nonsignificant relationship between physical activity and emotion regulation, cognitive reappraisal, expressive suppression.

**Table 4**

*Sample Linear Regression Analysis shows Procrastination as Predictor of Physical activity among University Students (N=300)*

| | B | SEB | b | T | P |
|---|---|---|---|---|---|
| Constant | 66.11 | .90 | - | 73.12 | .00 |
| Predictor | -.001 | .00 | -.15 | -2.60 | .01 |
| R | .15 | - | - | - | - |
| $R^2$ | .022 | - | - | - | - |
| F | 6.79 | - | - | - | .01 |

Table 4 mentioned above shows the impact of physical activity on university students. The $R^2$ value of .022 shows that predictor variable explained a 2.2 % effect on procrastination is due to physical activity with F (1, 298) = 6.79 ($p$<0.05). The findings show that physical activity negatively predicts procrastination (β=-.15, $p$ < .01).

**Table 5**

*Difference across different level of Physical Activity on procrastination among university students(N=300).*

| | Physical activity (Low & Moderate) N=141 | | Physical activity (High) N=159 | | | | 95%CI | | Cohen's d |
|---|---|---|---|---|---|---|---|---|---|
| Variable | M | SD | M | SD | t | p | LL | UL | |
| Procrastination | 66.51 | 9.82 | 62.37 | 10.24 | 3.56 | 0.00 | 1.85 | 6.42 | 0.41 |

*Note.* CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit

An independent sample t-test revealed that students with higher physical activity (M=62.3, SD=10.42) had significantly lower procrastination than those with lower physical activity level (M=66.52, SD=9.82), t (3.62, p< .001). This supports the hypotheses that higher physical activity leads to less procrastination.

**Table 6**

*Analyzing the mediating effect of Resilience in the relationship between Physical activity and Procrastination among university students (N= 300).*

| | Total effect | | | | Direct Effect | | | | Indirect Effect | | 95%CI | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S. E | t | P | B | S. E | t | p | B | S. E | LL | UL |
| PA | -.15 | .06 | -2.60 | .01 | -.13 | .057 | -2.28 | .02 | -.02 | .013 | -.049 | -.0004 |

*Note.* PA=Physical Activity

The results suggest that resilience partially mediates the relationship between physical activity and procrastination. A significant indirect effect of physical activity on procrastination through resilience was observed as $b$ = .013, CI [-.049, -.004].

A comparative analysis of model 1 and 2 showed that the direct effect (path c'= -.13**) is greater than the total effect (path c= -.15**), although both are significant, suggested partial mediation. There was significant direct effect of physical activity on procrastination as well as a significant mediating effect of resilience in relationship between physical activity and procrastination.

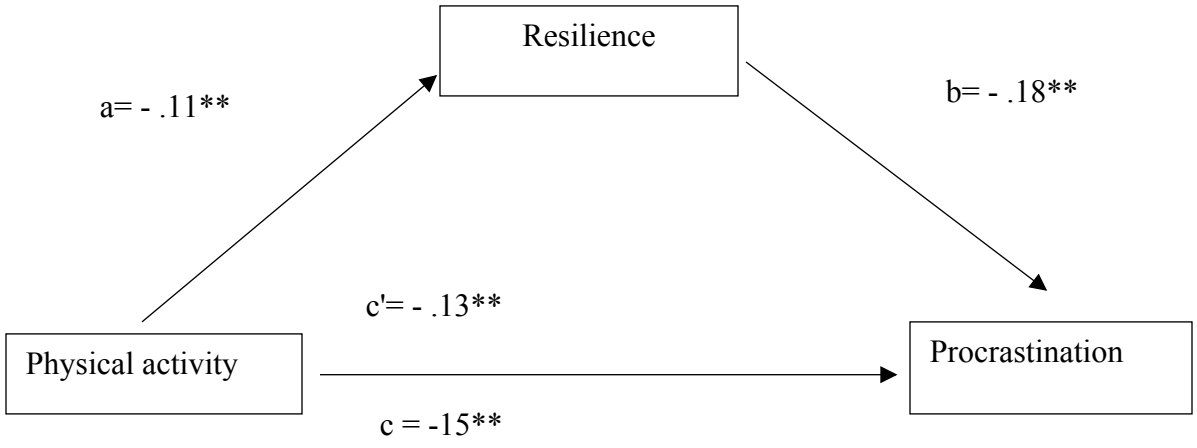


**Figure 2** *shows the mediating role of resilience between relationship of physical activity and procrastination among university students*.

**Table 7**

*Analyzing moderating role of Emotion regulation (Expressive suppression) in the relationship between physical activity and procrastination among university students (N=300).*

| | | | | | 95%CI | |
|---|---|---|---|---|---|---|
| Variables | b | SEB | T | P | LL | UL |
| Constant | .014 | .056 | .24 | .80 | -.097 | .126 |
| Exp | .007 | .057 | .12 | .90 | -.106 | .120 |
| PA | -.143 | .057 | -2.50 | .01 | -.255 | -.030 |
| Exp*PA | -.16 | .058 | -2.77 | .00 | -.276 | -.047 |

*Note* PA=Physical activity Exp=Expressive Suppression

Table 7 shows the moderating effect of expressive suppression on physical activity and procrastination among university students. Results show that there is a significant interaction between physical activity and expressive suppression in predicting procrastination β= -.161, t=-2.77, p <.05, 95% CI (-.276-.047).

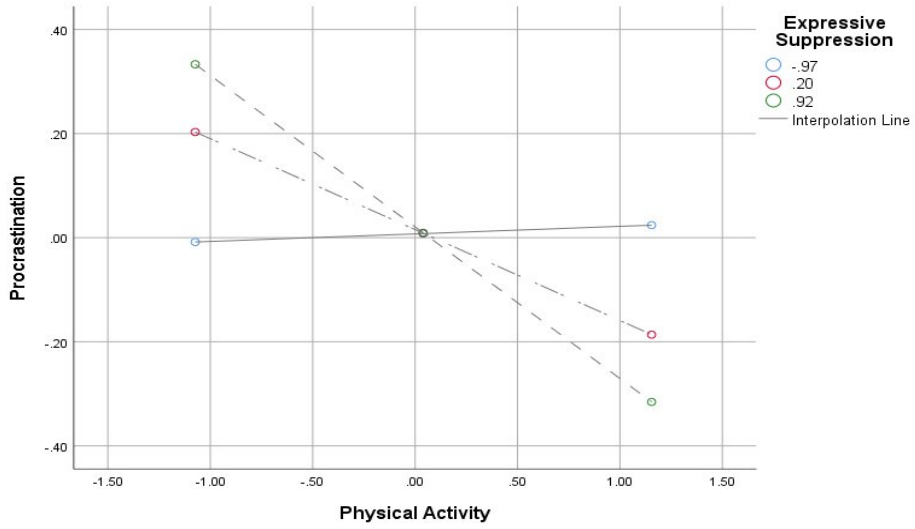

**Figure 3** *Moderation effect of Expressive Suppression in the relationship between Physical Activity and Procrastination.*

**Table 8**

*Analyzing the moderating role of Emotion regulation (Cognitive reappraisal) in the relationship between physical activity and procrastination among university students (N=300).*

| | | | | | 95%CI | |
|---|---|---|---|---|---|---|
| Variables | b | SEB | T | P | LL | UL |
| Constant | .006 | .0572 | .11 | .91 | -.10 | .12 |
| Cogn | -.035 | .057 | -.61 | .53 | -.149 | .078 |

| | | | | | | |
|---|---|---|---|---|---|---|
| PA | -.149 | .058 | -2.60 | .00 | -.262 | -.036 |
| Cogn*PA | -.097 | .05 | -1.75 | .08 | -.206 | .012 |

*Note* PA=Physical activity Cong=Cognitive Reappraisal

Table 8 shows the moderating effect of cognitive reappraisal on physical activity and procrastination among university students. Results shows that there is a nonsignificant interaction between physical activity and cognitive repression in predicting procrastination β= -.097, t=-1.75, p > .05, 95% CI (-.206, .012). This indicates that relationship between physical activity and procrastination is unconditional upon cognitive repression.

**Table 9**

*Difference across Gender in relation to physical activity and procrastination, resilience and Emotion regulation between male and female university students (N=300).*

| | Male N=125 | | Female N=175 | | | | 95%CI | | Cohen's d |
|---|---|---|---|---|---|---|---|---|---|
| Variable | M | SD | M | SD | t | p | LL | UL | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PA | 1727.02 | 1346.74 | 1412.17 | 1279.0 | 2.05 | .04 | 13.49 | 616.20 | .24 |
| Procrastination | 64.48 | 9.92 | 64.20 | 10.49 | .23 | .81 | -2.08 | 2.64 | .03 |
| Resilience | 18.68 | 3.18 | 17.71 | 3.15 | 2.60 | .01 | .23 | 1.69 | .31 |
| ES | 19.12 | 4.99 | 18.33 | 5.04 | 1.35 | .17 | -.36 | 1.95 | .16 |
| CR | 28.39 | 7.33 | 28.89 | 6.54 | -.62 | .53 | -2.09 | 1.08 | .07 |

*Note.* PA=Physical activity, ES=Expressive Suppression, CR= Cognitive Reappraisal

Table 9 shows the difference between male and female university students on physical activity and procrastination, resilience and emotion regulation. It indicates that Male university students score more on physical activity and resilience compared to female university students. However, there is a non-significant difference on procrastination and emotion regulation strategies.

**Table 10**

*Independent sample t-test to investigate the difference on the basis of educational level Difference across educational level on to procrastination and Emotion regulation between university students (N=300)*

| | BS | MS | | 95%CI | Cohen's |
|---|---|---|---|---|---|

| | N=200 | | N=100 | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| Variable | M | SD | M | SD | t | P | LL | UL | |
| PA | 1562 | 1262.2 | 1505.9 | 1419.5 | .33 | .73 | -274.7 | 387.0 | .04 |
| Procrastination | 63.48 | 10.95 | 66.01 | 8.45 | -2.20 | .03 | -4.78 | -.27 | .26 |
| ES | 18.93 | 4.94 | 18.12 | 5.17 | 1.32 | .18 | -.39 | 2.02 | .16 |
| CR | 28.59 | 6.72 | 28.88 | 7.21 | -.34 | .73 | -1.95 | 1.37 | .04 |

*Note*. ES= Expressive Suppression, CR= Cognitive Reappraisal

Table 10 shows the results of the mean difference on the basis of the education level of participants on procrastination and emotion regulation. Participants holding a Master's degree exhibit higher levels of procrastination compared to BS degree. However, there is no significant difference between BS and MS level students on physical activity, expressive suppression and cognitive reappraisal.

**Table 11**

*Independent sample t-test to investigate age group difference on physical activity procrastination, and resilience between university students (N=300).*

| | 18-22 | 23-27 | 95%CI | Cohen's |
|---|---|---|---|---|
| | N=200 | N=100 | | d |

| Variable | M | SD | M | SD | t | p | LL | UL | |
|---|---|---|---|---|---|---|---|---|---|
| PA | 1740.4 | 1272.5 | 1149.2 | 1315.1 | 3.75 | .00 | 281.04 | 901.35 | .46 |
| Procrastination | 62.55 | 9.95 | 67.86 | 9.94 | -4.35 | .00 | -7.70 | -2.90 | .53 |
| Resilience | 17.83 | 3.27 | 18.68 | 2.97 | -2.17 | .03 | -1.61 | -.079 | .27 |
| ES | 18.73 | 4.93 | 18.53 | 5.23 | 1.095 | .27 | -.77 | 2.71 | .03 |
| CR | 29.01 | 6.50 | 28.0 | 7.56 | .318 | .75 | -1.04 | 1.44 | .14 |

*Note.* PA=Physical activity, ES=Expressive Suppression, CR= Cognitive Reappraisal

Table 11 describes the results of a comparison between two age groups of study participants on physical activity, procrastination, and resilience. The results indicate that age group (18-22) are more physically active, less procrastination and less resilient than the age group (23-27). However, there is no significant difference in emotion regulation strategies.

**Table 12**

*Independent sample t-test to investigate the difference on the basis of Hostelites and Day Scholar across procrastination university students (N=300).*

| | Hostelites | Day Scholar | 95%CI | Cohen's |
|---|---|---|---|---|

| | N=102 | | N=198 | | | | | | d |
|---|---|---|---|---|---|---|---|---|---|
| Variable | M | SD | M | SD | t | P | LL | UL | |
| Procrastination | 17.58 | 2.99 | 18.38 | 3.26 | -2.06 | .04 | .038 | .156 | 0.25 |

Above Table 12 describes the results of the comparison between two groups of participants i.e. Hostelites and Day Scholars, on Procrastination. Analysis indicates that Day Scholars exhibit higher scores on procrastination as compared to Hostelites.

## Chapter 4

### Discussion

This study aims to investigate how physical activity affects procrastination and assess how role of resilience as a mediator and the role of emotion regulation as a moderator between procrastination and physical activity among university students. A sample of the study was taken from different universities of Islamabad and Rawalpindi. The sample was comprised of university students (N=300) studying at undergraduate BS (Hons), and postgraduate MS/MPhil degree

programs. Data of the present study was collected by using General Procrastination Scale (Lodha et., 2016), International Physical Activity Questionnaire (Craig et al., 2003), Emotion Regulation Questionnaire (Gross and John., 2003), and Brief Resilience Scale (Smith et al., 2008)). The reliability values for Brief Resilience Scale, ($\alpha = 0.59$) are slightly below the conventional threshold. These values can be due to short item length of the scales.

First hypothesis of the research was that there is a positive relationship between physical activity, resilience, and emotion regulation among university students. The findings in Table 3 demonstrated a strong positive correlation between university students' resilience, emotion regulation, and physical activity. These results are important for multiple reasons, as they highlight the link and interdependence of important psychological constructs. Physical activity, resilience, and emotion regulation are all integral parts of students' overall well-being and in academic life. This positive relationship suggests that increasing one of these aspects may have a beneficial effect on the other aspects. The rationale for investigating these relationships was backed by existing literature, and the current findings align with previous studies. According to earlier studies, physical activity improves emotion regulation (Zhao et al., 2024) and was linked to increased resilience (Mata et al., 2020).

Similarly, physical activity was significantly and positively associated with resilience (Xu et al. 2021; Liu et al., 2024). This indicates that as physical activity increases, resilience also increases. The finding also aligned with those reported by (Qiu et al., 2025), whose metanalysis of multiple studies demonstrated an enhanced positive correlation between resilience and physical activity. Similarly, the research conducted by Dunston et al., (2020) also explored the relationship of physical activity with resilience. The study found that involvement in vigorous levels of physical activity in daily routine can significantly and positively impact the person's ability of to bounce

back (resilience). There are contrasting studies on the connection between physical activity and emotion regulation. According to the results of the present study, physical activity shows a positive but nonsignificant relationship with cognitive reappraisal and with expressive suppression. That finding aligns with the results of another study by Edwards et al., (2018) that explores the relationship between aerobic exercises, meditation and emotion regulation, and results found that there was no significant difference between aerobic exercises, meditation, and emotion regulation after being exposed to a negative emotion trigger (Edwards et al., 2018). In another study, although regular physical activity contributed positively to controlling and regulating emotions, there was no significant change observed in perception and acknowledgement of emotions and emotion expressivity (Bahmani et al., 2019). Similarly, there was no significant correlation between physical exercise and emotion regulation in research by Al-Wardat et al. (2024). One study found that an emotion regulation intervention led to a relatively significant increase in physical activity (Rhodes et al., 2025).

However, the study conducted by Sheng et al., (2024) results showed that physical activity and cognitive reappraisal are positively correlated, and physical activity and expression inhibition are also positively correlated. Similarly, according to the study conducted by Wu et al., (2022) physical activity can significantly enhance the cognitive reappraisal strategy but physical activity was non significantly negatively correlated with the Expressive Suppression strategy. While other study conducted by (Wu et al., 2025) showed that physical exercise was significantly negatively correlated with expressive suppression.

The study's second hypothesis states that **“**Physical activity negatively predicts procrastination among university students”. Our results are consistent with previous research; for instance, one study identified a strong negative correlation between procrastination and a type of

intense physical activity (Shi et al., 2021). Numerous studies have examined the relationship between physical activity and procrastination; for instance, Ren et al.'s (2021) study found that academic procrastination decreases with increased physical activity. Furthermore, Yang et al. (2023) study of Chinese college students revealed that students who engage in more physical exercise tend to procrastinate less. Similarly, the greater level of physical activity has negative association with irrational procrastination (Kuang et al. 2023). On the other hand, study conducted by Ren et al. (2023) showed contrasting result that physical activity has weak negative but statistically non-significant on procrastination.

Furthermore, the result of this study found that higher physical activity shows significantly lower level of procrastination compared to the lower physical activity group that showed high level of procrastination. Similarly, Zhuan et al. (2024), explored the relationship and found a significant and negative correlation between procrastination and physical activity. For this, the authors split the subjects into three levels of physical activity (low, medium, and high) and examined how procrastination is affected by each level. The findings showed that, in comparison to the medium and lower physical activity groups, highly active participants exhibit noticeably less procrastination. Similarly, participants in the group that engages in more physical activity (more than 120 minutes per week) procrastinate less than those in the group that engages in less physical activity (less than 60 minutes per week) (Codina et al., 2020).

The third hypothesis is "Resilience significantly mediates the relationship between physical activity and procrastination among university students". Our findings showed that the association between procrastination and physical activity is partly mediated by resilience. These results are consistent with earlier studies showing that physical activity increases resilience (Cowdrey, 2025) and that procrastination decreases with increased resilience (Ko and Chang, 2019). Additionally,

a study by Xu et al. (2021) investigated the relationship and discovered a significant correlation between college students' resilience and physical activity. The findings are in line with those of Ho et al. (2015), who demonstrated that resilience mediated the association between an individual's level of physical exercise and mental health. Likewise, another study demonstrates that the association between physical exercise and physical self-efficacy was also partially mediated by resilience (Qiu et al., 2025). These findings highlight how important it is to include resilience in university students' overall physical and mental health.

The fourth hypothesis of the study is “Emotion regulation significantly moderates the relationship between physical activity and procrastination”. The results of the research showed that the expressive suppression of emotion regulation significantly moderated the relationship between physical activity and procrastination. That finding is supported by the existing researches for instance, study show that Physical exercises can enhance a person's ability to regulate their emotions (Liu et al., 2022). For better life quality inclusion of emotion regulation strategies can help an individual. For example, according to one research, emotion regulation enhances the quality of life (Dubey et al., 2020) and better psychological well-being (Extremera & Rey, 2014). According to one study Dai et al., (2021), emotion regulation is significantly related to overall wellbeing of an individual especially level of physical activity and physical health. Moreover, another study also shows that Emotion regulation use as a coping strategy to reduces the negative impact of anxiety and depression (Özdin & Özdin, 2020, Rajkumar, 2020). Emotion regulation significantly reduces procrastination (DeArmond et al. 2014, Eckert et al., 2016). One study also explains that difficulty in regulating the emotions can leads to procrastination among students (Rad et al., 2025)

As the findings of the present study revealed that the expressive suppression subscale of Emotion regulation significantly moderated the relationship between physical activity and procrastination. Students with more expressive suppression skills will benefit more from a higher level of physical activity. This supports previous work showing that emotion regulation enhances physical activity (Dai et al., (2021) and is linked with procrastination (Anwar et al., 2025). In contrast to findings, a study by Wu et al. (2022) found a negative but non-significant relationship between expressive suppression and physical activity, while Al-Wardat et al. (2024) found a non-significant relationship between expressive suppression and physical activity. The results are backed by the Self-determination theory The study by involvement in Physical activity satisfies self-determination needs and gives positive reinforcement and improves emotion regulation that reduces procrastination and stress (Wei & Gaik 2023) and also physical activity enhances resilience by fulfilling self-determination needs (Li et al., 2024) resilience however also reduces the procrastination ((The Oxford Handbook of Self-Determination Theory, 2023).

Interestingly, the cognitive reappraisal, another subscale of emotion regulation, did not significantly moderate this relationship. A similar to, study by Al-Wardat et al. (2024) demonstrates that there is no significant correlation with cognitive repression. According to study, higher use of cognitive reappraisal strategies might be associated with lower procrastination but there was a non-significant association between Cognitive reappraisal and procrastination (Sirois et al., 2018). Moreover, the study by Al-Wardat et al. (2024) also shows the non-significant relationship between physical activity and cognitive reappraisal strategies**.** Although some of the previous studies have shown a connection, but there are some studies that have shown the contrasting results. For example, previous studies (e.g., Wu et al. 2022) has showed that physical activity led to more cognitive repression in an individual. Our results suggests that this subscale

may not direct in the same way. This could be because of variations in measurement or context of the study, or it could be because emotion regulation is more important in this interaction between university students. This study explains that if someone regularly attempts to rethink situations in a more positive or calm way, it doesn't necessarily mean they will procrastinate less. Therefore, while using cognitive reappraisal might occasionally help with emotions regulation, it doesn't seem to play a major role in stopping people from procrastination.

The rejection of this hypothesis encourages more exploration of the intricate connections among procrastination, physical activity and cognitive reappraisal strategy. Future studies could concentrate on examining the specific processes and conditions that underpin these factors' interactions and how they affect the procrastination behavior of students and their overall wellbeing. Students' physical activity level and procrastination behavior are complex phenomenon and are influenced by multiple factors. Although physical activity level and cognitive reappraisal are interlinked individual characteristics according to many studies (Sheng et al., 2024; Wu et al., 2022), the current research suggests that they might not solely determine procrastination or could potentially determine it in a more complex way. Thus, furthermore, more future research could help to understand their roles in procrastination behaviour in university students.

The fifth hypothesis of the present study is that male university students have higher physical activity, procrastination, resilience, and emotion regulation than female university students. Our study shows that gender has an impact on how individuals are involved in levels of physical activity and resilienc. Male students is more physically active compared to female university students. For example, Wu et al.'s (2022) study revealed a significant difference in physical activity between males and females. Similarly, the study by Shi et al., (2021) men had significantly higher physical activity time than women. The study demonstrated that males have

higher physical activity as compared to females. Moreover, Kuang et al., 2023) study demonstrated that men have had significantly higher physical activity time as compared to females. However, one study, Rozental et al., (2022) showed that there was no significant difference between males and females. The results of the present study found that there is significant differences between male and female university students on resilience. Male university students score on resilience compared to females. In addition, one study examined resilience and showed that men participants showed greater resilience as compared to females (Qiu et al. 2025). However, Codina et al., (2020) research showed a non-significant difference between males and females.

According to the results of the present study, there is no significant difference between male university students and female university students in emotion regulation strategies. The results contrast with the study that found that females use more emotion regulation strategies than boys. (Sanchis-Sanchis et al., 2020). The study by Rad et al. (2025) showed that there is a significant difference between males and females. In males showed more difficulty in regulating emotions as compared to females (Rad et al., 2025). However, one study shows similar results to our results. The study showed that no significant differences between males and females in cognitive reappraisal strategy and expressive suppression strategy. According to the results of this research, there is no significant difference between male and female university students on procrastination. However, the Rad et al. (2025) study found that female participants procrastinate less compared to male participants. Similarly, the other studies also explored that males procrastinate more as compared to females (Shi et al. 2021; Jauhar et al., 2024).

The study also examined different educational level on procrastination and emotion regulation among university students. Our result shows that participants holding a Master's degree exhibit higher levels of procrastination as compare to BS degree level. This result can be due to

workload of Master's degree students as research conducted by Hussain and Sultan (2010) found that students' procrastination and inability to complete their work on time appeared to be caused by a variety of factors, including workload, lack of motivation and interest, overconfidence, assignments and presentations too much work to do at once that causes academic stress. However, the study by Rad et al. (2025) showed contrasting results. The authors compare different education levels to explore the impact of education level on procrastination of students and results found the significant difference between three education levels. The lower level of degree e.g., Associate degree showed higher level of procrastination compared to Bachelor degree and Professional doctorate degree. Furthermore, the study found there is no significant difference on emotion regulation. However, the study by Rad et al., (2025) compare different education level to explore the impact of different education level on difficulty in regulating emotions of students and results found the significant different between three education level. The lower level of degree e.g., Associate degree showed a higher level of emotion regulation as compared to the Bachelor degree and Professional doctorate degree.

The current study also examined different age groups on physical activity, resilience and procrastination among university students. The result of the study showed that the age group (18-22) are more physically active compared to the age group (23-27). The present study also showed that the age group 23 to 27 show more procrastination and resilience compared to the age group 18 to 22. The study conducted by Codina et al. (2020) found that the youngest age group (18–29) procrastinates more than other age groups. However, the research carried out by Rad et al. (2025) showed no significant difference between different age groups, like (18–22) and (23–27), on procrastination and difficulty in regulating emotions.

The results demonstrated a significant difference in procrastination between Hostelites and day scholars in universities. The day-scholar university students show more procrastination compared to the Hostelite.

**Limitations and Suggestions**

It is a complex and deep research topic to examine how physical activity affects procrastination in university students, with an emphasis on the mediating and moderating effects of resilience and emotion regulation. Here are some limitations and suggestions for this research study:

- The data was collected only from only Islamabad and Rawalpindi universities due to limited resources. That can affect the generalizability of the study.
- 
- Future research should think about adding more objective measures to increase the validity of the findings, as the current study relied only on self-report measures, which are often used yet susceptible to response biases.
- To investigate how these variables evolve over time and their long-term effects on procrastination, future study should be longitudinal research method. This might offer insightful information about the causal connections.
- Incorporating qualitative approaches, such focus groups or interviews, can help gain a deeper understanding of how students interpret resilience and emotion regulations. This could have practical implications for an educational institution.
- To evaluate the findings' generalizability, conduct the study again in different educational institutions and cultural contexts.

- Future study should look at participants who are teenager as well as the kind and amount of physical activity.

**Implications**

The study findings can guide future research in the field of educational psychology and student development. Researchers can build upon the results to delve deeper into the mechanisms by which physical activity, resilience, emotion regulation and procrastination. Promoting the overall wellbeing of students may be impacted by an understanding of how emotion regulation mitigates the effect of physical activity on procrastination. Educational institutions might think about providing workshops on developing emotion management skills or lowering students' procrastination. Furthermore, fostering students' overall well-being may be impacted by an awareness of resilience's involvement in the connection between procrastination and physical activity. Schools can organize sessions on resilience-building or ways to help students stop putting things off.

Findings from this research could help to educational policies and practices. The study suggests that integrating physical activity, resilience, and emotion regulation activities into school curricula or counselling services may be beneficial, as it shows that these practices can decrease procrastination among university students. The findings of this study can be used by university counselors and support services to enhance their intervention plans. To significantly minimize procrastination, they could, for instance, create programs that assist students in increasing their physical activity, improving their emotion regulation skills, and developing coping mechanisms. This study can help advance holistic education, which emphasizes not just academic performance but also the growth of one's emotion and personal qualities. Institutions might understand how

important it is to promote a well-rounded education that include students' both mental and physical health.

The research could promote interdisciplinary cooperation between studies of physical health, psychology, and education. Collaboration can lead to innovative approaches to students' both physical and psychological well-being. The research findings may inspire the development of personal development programs within universities, helping students build the skills and qualities associated with physical health, emotion regulation and resilience. Universities may consider offering resources and workshops aim at raising the awareness to help students become more conscious of the importance of physical activity. These materials can be made to assist students better controlling their emotions, managing stress, deal with life's challenges, focus better, and develop a sense of direction. The findings of the study can also benefit parents and teachers by highlighting the importance of encouraging these qualities in children from an early age.

**Conclusion**

The current study aimed to investigate how university students' emotion regulation and resilience relate to their procrastination and physical activity levels. First and foremost, the study has shown that university students who participate in greater physical activity tend to procrastinate less. The results of the study showed that resilience acts as a mediator in the study; students who physically exercise more are more resilient, which in turn leads to less procrastination. Furthermore, the study has shown the significant role of emotion regulation as a moderator between physical activity and procrastination. Similarly, the expressive suppression strategy enhances the impact of physical activity to reduce procrastination. Results also show a non-significant interaction between cognitive reappraisal and physical activity in predicting procrastination. According to the study's findings, male college students exhibit greater levels of

procrastination, resilience, emotion regulation, and physical activity than female students. According to the study's findings, students with master's degrees procrastinate more than those with bachelor's degrees. Additionally, the study found that those in the (18–22) age range are more physically active than students in the (23–27) age range. Additionally, compared to the (18–22) age group, the (23–27) age group exhibits higher levels of procrastination and resilience. Additionally, university students who are day scholars have higher levels of procrastination than those who are hostelite and the university students. It is essential to comprehend the complex and multidimensional link between these variables, which is impacted by personal characteristics, life events, and other external factors. Future studies in this area should therefore focus further on the processes and contextual differences that can influence the association between procrastination and physical activity.

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# Appendices

## Appendix A

### INFORM CONSENT

Respected Respondent, I am a students of Ms. Psychology from International Islamic University Islamabad. The present research is the part of ongoing conducted research at Department of Psychology, International Islamic University Islamabad. This present research is comprised of the attached questionnaires.

Therefore. it is requested to fill the attached questionnaires on the basis of your experience and personal view. While the information provided by you will be kept confidential and completely anonymous and will be solely used for the research purpose. The consent form also allows you the

privilege of right to withdraw from the process at any point where you don't want to participate any further. However, it will be grateful if you fill these questionnaires till the end. In case you counter any sort of difficulty regarding questionnaire items you can contact the researcher. Regards.

Email: sania.msep@students.iiu.edu.pk

**Appendix B**

**DEMOGRAPHIC SHEET**

| | | |
|---|---|---|
| Gender: | i). Male | ii). Female |
| Family System: | i) Nuclear | ii) Joint |
| Education level: | i) BS | ii) MS |
| Residence: | i) Rural. | ii) Urban |
| Marital status: | i) Single | ii) Marrier |

Age: _____

University: _____

Last obtained CGPA: _____

Department and faculty: _____

Estimated Family income(monthly): _____

Father education: _____

Mother education: _____

Father occupation: _____

Mother occupation: _____

Number of Siblings: _____

Birth order: _____

Hostelites/Day Scholars: _____

Do you involve in physical activities, if yes name them_____

Do you play physical game. i) Yes. ii) No

Name the game which you play on daily basis_____

Are you the member of any sports team at your institute _____

**Appendix C**

**International Physical activity questionnaire**

The following questions are about **physical activity** in the last 7 days. Please read carefully and answer to the best of your knowledge.

Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think about all the **vigorous activities** that you did in the last 7 days. **Vigorous physical activities** refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

___ days per week

- No vigorous physical activities

2. How much time did you usually spend doing vigorous physical activities on one of those days?

___ hours per day

____ minutes per day

- Don't know/Not sure

Now Think about all the **moderate activities** that you did in the last 7 days. **Moderate activities** refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

___ days per week

- No moderate physical activities

4. How much time did you usually spend doing moderate physical activities on one of those days?

____ hours per day

____ minutes per day

- Don't know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ days per week

- No walking

6. How much time did you usually spend walking on one of those days?

_____ hours per day

_____ minutes per day

- Don't know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend sitting on a week day?

_____ hours per day

_____ minutes per day

- Don't know/Not sure

**Annexure D**

## General Procrastination Scale

Following scale measure **procrastination**. Rate the extent to which you apply when you think about negative experiences or problem

1= Never 2= Rarely 3= sometime 4= Often 5= Always

| | Items | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|---|
| 1 | I often try to avoid doing a task that I have little or no interest in. | | | | | |
| 2 | I often delay tasks that are desirable to me. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | When a task is highly stressful, I'm likely to put in more effort. | | | | | |
| 4 | I think that certain problems can subside or be solved on their own, with a passage of time. | | | | | |
| 5 | I begin work immediately on a task once it has been given to me. | | | | | |
| 6 | I have often had services terminated because of unpaid bills. | | | | | |
| 7 | I often delay attending to medical issues concerning my health. | | | | | |
| 8 | I prefer submitting an assignment before the deadline. | | | | | |
| 9 | I generally don't start working on a project or assignment immediately. | | | | | |
| 10 | I am usually late when I have to go out and meet friends for a movie or dinner or other such plans. | | | | | |
| 11 | I often put off doing tasks until urgency develops | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12 | Whenever I make a plan of action, I follow it. | | | | | |
| 13 | I think too much about things I would like to do but rarely get around to doing them. | | | | | |
| 14 | I tend to work at the eleventh hour for a task or project. | | | | | |
| 15 | I postpone my chores to a later time when something more interesting comes up. | | | | | |
| 16 | I prefer planning ahead for tasks and events. | | | | | |
| 17 | I needlessly delay finishing jobs, even when they're important. | | | | | |
| 18 | I prefer working on one assignment at a time | | | | | |
| 19 | I do not complete tasks until I am insisted to complete them. | | | | | |
| 20 | I am generally late at the workplace or college | | | | | |
| 21 | I try to avoid any backlog of work. | | | | | |
| 22 | I delay the tasks that distress me. | | | | | |
| 23 | I feel guilty when I delay doing tasks | | | | | |

**Annexure E**

## Emotion Regulation Questionnaire

Following scale measures **Emotion regulation**. Read each statement carefully and select the statement that is suitable.

1----------2----------3----------4----------5----------6----------7

Strongly disagree | Neutral | Strongly agree

| | Items | Strongly disagree | Disagree | Slightly Disagree | Neutral | Slightly agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about. | | | | | | | |
| 2 | I keep my emotions to myself. | | | | | | | |
| 3 | When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about. | | | | | | | |
| 4 | When I am feeling positive emotions, I am careful not to express them | | | | | | | |
| 5 | When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm. | | | | | | | |
| 6 | I control my emotions by not expressing them. | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7 | When I want to feel more positive emotion, I change the way I'm thinking about the situation. | | | | | | | |
| 8 | I control my emotions by changing the way I think about the situation I'm in. | | | | | | | |
| 9 | When I am feeling negative emotions, I make sure not to express them. | | | | | | | |
| 10 | When I want to feel less negative emotion, I change the way I'm thinking about the situation. | | | | | | | |

**Annexure F**

**Brief resilience Scale**

Following scale measure **resilience.** Read each statement carefully and select the statement that is best suitable.

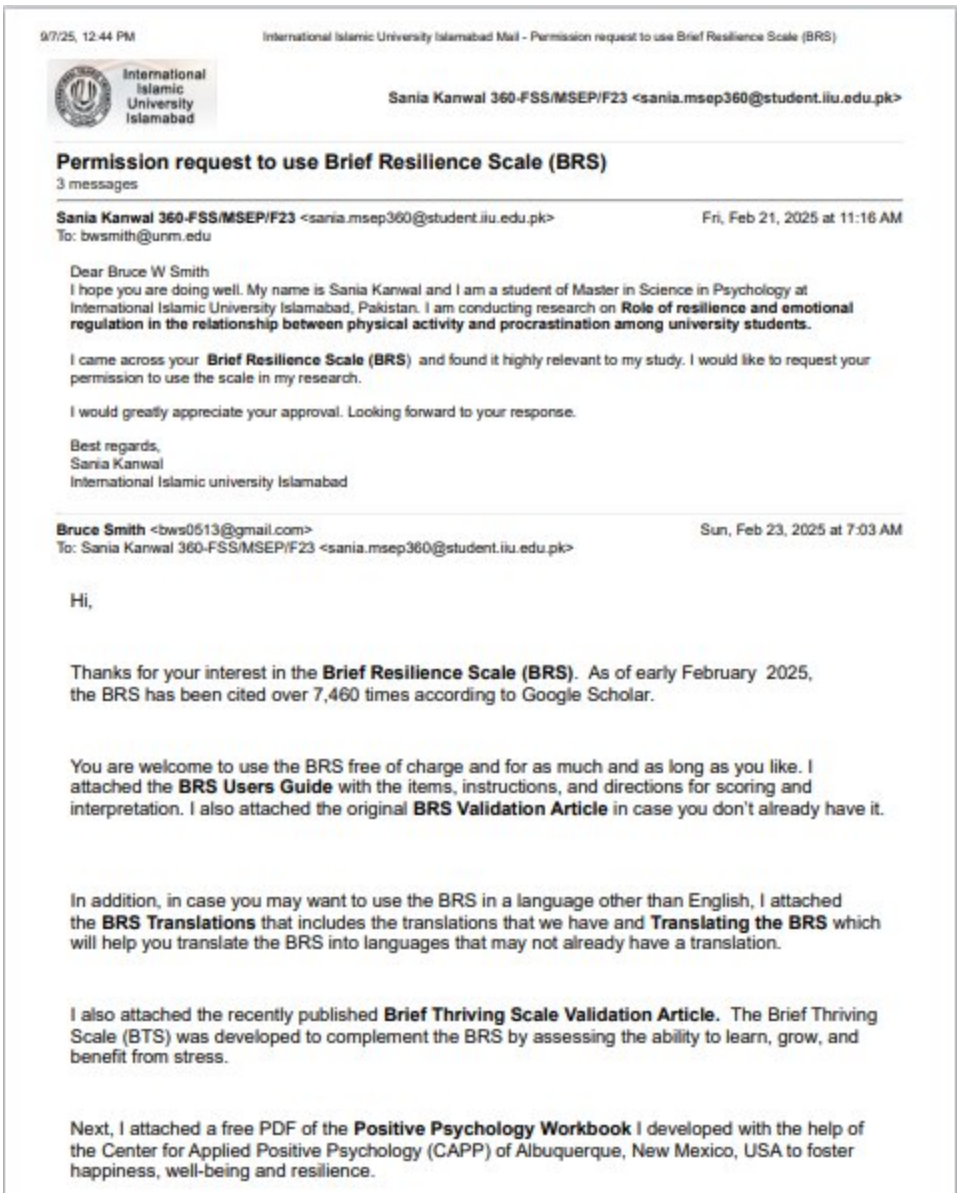
1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree

| | Items | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 1 | I tend to bounce back quickly after hard times | | | | | |
| 2 | I have a hard time making it through stressful events. | | | | | |
| 3 | It does not take me long to recover from a stressful event. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | It is hard for me to snap back when something bad happens | | | | | |
| 5 | I usually come through difficult times with little trouble. | | | | | |
| 6 | I tend to take a long time to get over set-backs in my life | | | | | |

**Annexure G**

**Permission from Author for using Brief Resilience Scale**



9/7/25, 12:44 PM International Islamic University Islamabad Mail - Permission request to use Brief Resilience Scale (BRS)

International Islamic University Islamabad

Sania Kanwal 360-FSS/MSEP/F23 <sania.msep360@student.iiu.edu.pk>

**Permission request to use Brief Resilience Scale (BRS)**

3 messages

**Sania Kanwal 360-FSS/MSEP/F23** <sania.msep360@student.iiu.edu.pk> Fri, Feb 21, 2025 at 11:16 AM
To: bwsmith@unm.edu

Dear Bruce W Smith
I hope you are doing well. My name is Sania Kanwal and I am a student of Master in Science in Psychology at International Islamic University Islamabad, Pakistan. I am conducting research on **Role of resilience and emotional regulation in the relationship between physical activity and procrastination among university students.**

I came across your **Brief Resilience Scale (BRS)** and found it highly relevant to my study. I would like to request your permission to use the scale in my research.

I would greatly appreciate your approval. Looking forward to your response.

Best regards,
Sania Kanwal
International Islamic university Islamabad

**Bruce Smith** <bws0513@gmail.com> Sun, Feb 23, 2025 at 7:03 AM
To: Sania Kanwal 360-FSS/MSEP/F23 <sania.msep360@student.iiu.edu.pk>

Hi,

Thanks for your interest in the **Brief Resilience Scale (BRS)**. As of early February 2025, the BRS has been cited over 7,460 times according to Google Scholar.

You are welcome to use the BRS free of charge and for as much and as long as you like. I attached the **BRS Users Guide** with the items, instructions, and directions for scoring and interpretation. I also attached the original **BRS Validation Article** in case you don't already have it.

In addition, in case you may want to use the BRS in a language other than English, I attached the **BRS Translations** that includes the translations that we have and **Translating the BRS** which will help you translate the BRS into languages that may not already have a translation.

I also attached the recently published **Brief Thriving Scale Validation Article.** The Brief Thriving Scale (BTS) was developed to complement the BRS by assessing the ability to learn, grow, and benefit from stress.

Next, I attached a free PDF of the **Positive Psychology Workbook** I developed with the help of the Center for Applied Positive Psychology (CAPP) of Albuquerque, New Mexico, USA to foster happiness, well-being and resilience.

## Annexure H

### Permission from Author for using Emotion Regulation Questionnaire

9/7/25, 12:47 PM International Islamic University Islamabad Mail - permission request to use Emotion Regulation Questionnaire(ERQ)

International Islamic University Islamabad

Sania Kanwal 360-FSS/MSEP/F23 <sania.msep360@student.iiu.edu.pk>

**permission request to use Emotion Regulation Questionnaire(ERQ)**

3 messages

**Sania Kanwal 360-FSS/MSEP/F23** <sania.msep360@student.iiu.edu.pk> Fri, Feb 21, 2025 at 11:13 AM
To: gross@stanford.edu

Dear Dr. Gross
I hope you are doing well. My name is Sania Kanwal and I am a student of Master in Science in Psychology at International Islamic University Islamabad, Pakistan. I am conducting research on **Role of resilience and emotional regulation in the relationship between physical activity and procrastination among university students.**

I came across your **Emotion regulation Questionnaire(ERQ,2003)** and found it highly relevant to my study. I would like to request your permission to use the scale in my research.

I would greatly appreciate your approval. Looking forward to your response.

Best regards,
Sania Kanwal
International Islamic University Islamabad

**James Gross** <gross@stanford.edu> Fri, Feb 21, 2025 at 6:47 PM
To: Sania Kanwal 360-FSS/MSEP/F23 <sania.msep360@student.iiu.edu.pk>

You're welcome to use the ERQ, which you may find on our website, URL below.
--

James J. Gross, Ph.D.
Ernest R. Hilgard Professor of Psychology
Professor of Philosophy (by courtesy)
Bass University Fellow in Undergraduate Education

Department of Psychology
Stanford University
Stanford, CA 94305-2130
Tel: (650) 723-1281
Email: gross@stanford.edu
Lab Website: http://spl.stanford.edu
Center Website: https://cas.stanford.edu/

[Quoted text hidden]

**Sania Kanwal 360-FSS/MSEP/F23** <sania.msep360@student.iiu.edu.pk> Fri, Feb 21, 2025 at 6:56 PM
To: James Gross <gross@stanford.edu>

Thank you for allowing this, I appreciate it
[Quoted text hidden]

https://mail.google.com/mail/u/0/?ik=7a49b79545&view=pt&search=all&permthid=thread-a:r1995667098009317466&simpl=msg-a:r5320464790266666... 1/1