

PROCRASTINATION AND ITS ASSOCIATION WITH STRESS AND SLEEPLESSNESS IN COLLEGE GOING STUDENTS - CROSS SECTIONAL STUDY

Gokul. P. Reghunathan ¹, Divya Prabha. A ², Iniyam Selvamani ^{3*} and Venkatraman Natarajan ⁴

¹ Final Year postgraduate, Department of Psychiatry, Saveetha Medical College Hospital, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, India.

² CRMI, Saveetha Medical College Hospital, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, India.

³ Professor, Department of Psychiatry, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, India.

⁴ Associate Professor, Department of Psychiatry, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, India.

Abstract

Background: Procrastination is the act of delaying or putting off tasks until the last minute, or past their deadline. Procrastination could be further stated as a habitual or intentional delay of starting or finishing a task despite knowing it might have negative consequences. The objective of the study was to measure the association of procrastination with sleeplessness and stress among college going students.

Methods: This Cross-sectional study was conducted among 204 college students. The questionnaires used in the study are Procrastination Quotient, Perceived Stress Scale (PSS), Insomnia Severity Index (ISI) which had questions related to procrastination, stress and sleep respectively. **Results:** Out of 204 study participants, Majority of the students studied were average procrastinators (n = 142; 69.6%), with moderate stress (160, 78.4 %) and with sub-threshold insomnia (99, 48.5%). There was a significant association between procrastination and stress. Even though there was no significant association between procrastination and ISI scores, a positive correlation was observed between PSS and ISI scores leading to indirect association between procrastination and insomnia. **Conclusion:** This result is in congruent with a growing body of evidence demonstrating that the proclivity to put off tasks or decisions may be key risk factors for the onset of stress and sleep disorders. The findings of this study highlights the necessity for an effective coaching programme that motivates and educates the students to focus on minimising procrastination by effective time management and organization skills

Keywords: Procrastination, Stress, Sleep, Procrastination Quotient, Perceived Stress Scale, Insomnia Severity Index.

INTRODUCTION

Procrastination is defined as “the act of needlessly delaying tasks to the point of experiencing subjective discomfort” by Solomon rothblum in 1984(1). Lay (1986) has also described procrastination with a different emphasis as “the tendency to postpone that which is necessary to reach some goal”(2). “Procrastinations involve the avoidance of the implementation of an intention” is another definition given by Van Eerde (2000)(3). These definitions individually covered the core features of procrastination that is delayed action, irrationality, known consequences, and intention.

Procrastination is a prevalent and significant problem in the modern day, and this negatively impacts upon their academic achievement(4). This has been associated with a variety of negative outcomes such as negative psychological symptoms, anxiety, depression, also the procrastinators suffered more health problems than non-procrastinators where they report more symptoms of physical illness(5). Student

procrastinators have been found to experience more overall stress than their non-procrastinator peers, especially right before their end of year deadlines(6).

The current study aimed to investigate the relationships between procrastination, stress and sleeplessness using Procrastination Quotient (PQ), Perceived Stress Scale (PSS), Insomnia Severity Index (ISI) respectively.

METHODOLOGY

This cross-sectional study was conducted after the approval of the Institutional ethical committee in Saveetha University, Chennai, South India. The study was conducted for a period of 6 months from January 2021 to June 2021. About 204 college students of both genders belonging to MBBS, Bachelor of Engineering and B.SC Nursing were recruited for the study after obtaining informed consent. Students less than 18 years and students with previous history of psychiatric illness were excluded from the study.

The study was conducted using an online questionnaire in Google form. The questionnaire used in the study had two parts. Part I had questions related to socio-demographic details and the individual's medical history. Part II was divided into three sections; the first section was to assess procrastination using Procrastination Quotient scale.(7) It consisted of 9 questions using Likert scale 1 – 5: 1 (very seldom or not true of me) to 5 (very often true, or true of me). Of the 9 questions, the 2nd, 5th and 8th questions were scored in opposite directions from the other items. The total score determines the severity of procrastination as the following: 19 or less indicates bottom 10%, 20 to 23 indicates bottom 10 to 25%, 24 to 31 indicates middle 50%, 32 to 36 indicates top 10 to 25%, 37 or more indicates top 10%. The bottom 10% stands for non-procrastinators, the top 10% stands for procrastinators and the middle 50% stands for average procrastinators.

The second section was to assess stress using Perceived Stress Scale (PSS) which consists of 10 questions (8). All the questions in this section were headed by the following question: 'in the last month, how often have you' the answers were graded using Likert scale 0 – 4: where 0 – never, 1 - almost never, 2 – sometimes, 3 - fairly often, 4 - very often. PSS scores are obtained by reversing responses (e.g., 0=4, 1=3, 2=2, 3=1 and 4=0) to the four positively stated items (item 4, 5, 7 & 8) and then summing across the scale items. Scores ranging from 0-13 would be considered low stress, 14-26 as moderate stress and 27-40 as high perceived stress.

The third section was to assess the current (last 2 weeks) severity of sleeplessness using Insomnia Severity Index consisted of seven questions using Likert scale (0-5).(9) The questions were rated to assess sleeplessness. The answers of all the seven questions were added up to get a total score. Total score of 0–7 is considered as No clinically significant insomnia, 8–14 as Subthreshold insomnia, 15–21 as Clinical insomnia (moderate severity), 22–28 as Clinical insomnia (severe).

A study done by Madhan B et.al.(10) reported that 27 % of students who participated exhibited a significant level of procrastination. Taking this as prevalence value, using Dobson's formula with 95% confidence interval and 6% as absolute error, the sample size was calculated to be 210 from which 204 students participated in the study after giving informed consent.

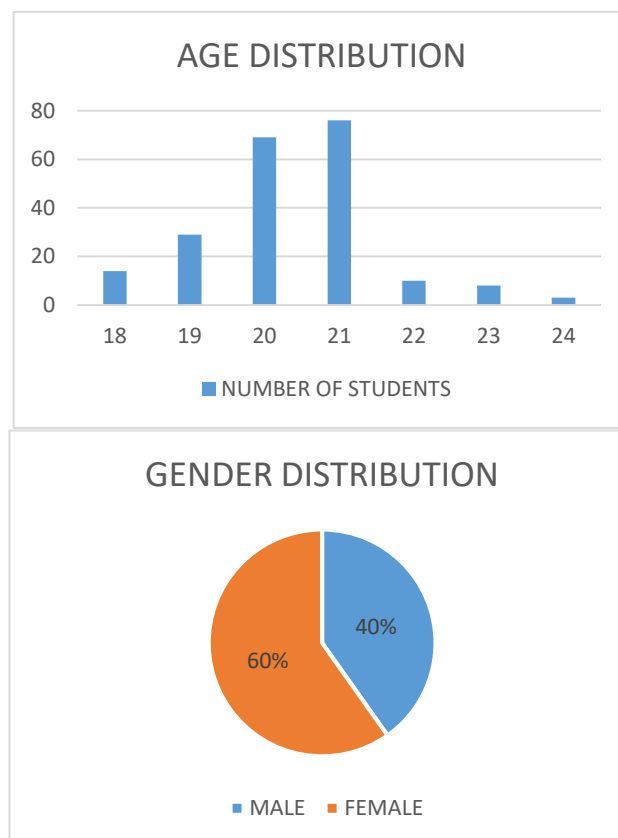
The data obtained was analyzed using IBM SPSS statistics software (Version 22.0). The Categorical variables were analyzed for frequencies and expressed as numbers

and percentages. The Continuous variables were checked for normal distribution using The Kolmogorov-Smirnov test. According to the normality tests, those with $p > 0.05$ were considered to be normally distributed. The continuous variables with Non-normal distribution were expressed as median with interquartile range and the mean ranks were compared with Mann Whitney test and Kruskal Wallis test appropriately. Spearman correlation test was done to test the co-relation between the continuous variables. The Chi square test was done to check the goodness of fit of equality of the categorical variables within the individual scale namely PQ, PSS and ISI. Chi Square test was done to look for the association between the categorical variables of all the three scales. For all statistical analyses, p -value < 0.05 was considered to be statistically significant.

RESULT

The age group of the study population ranged from 18 to 24 years with a mean age of 20.37 and standard deviation of 1.18. Of the 204-study sample, 82 (40.2 %) were male and 122 (59.8 %) were female. (Figure 1)

Figure 1: Age and gender distribution of students (n=204)



Majority of the study participants were medical students ($n = 178, 87.3\%$) followed by engineering students ($n = 21, 10.3\%$) and nursing students ($n = 5, 2.5\%$). 130 (63.7%) of them were prefinal year students followed by second year students ($n = 29, 14.2\%$), final year students ($n = 25, 12.3\%$) and first year students ($n = 20, 9.8\%$). 120 (41.2%) were day scholars and 80 (51.8%) were hostellers. (Table 1) Most of the students were from urban residence ($n = 150, 73.5\%$) and belonged to nuclear family ($n = 159, 77.5\%$). Of the study population, only 18 were married (8.8%) and 4 were in relationship (2.0%) rest all were unmarried. (Table 1)

Table 1: The baseline characteristics and socio-demographic data of the study population (n=204)

S. No.	Variable	Sub-category	Frequency (n)	Percentage (%)
1	Course of study	MBBS	178	87.3
		Bachelor of Engineering	21	10.3
		BSc. Nursing	5	2.5
2	Year of study	First year	20	9.8
		Second year	29	14.2
		Third year	130	63.7
		Final year	25	12.3
3	Mode of accommodation	Hosteller	84	41.2
		Day-scholar	120	58.8
4	Nature of Residence	Urban	150	73.5
		Semi-urban	44	21.6
		Rural	10	4.9
5	Family status	Nuclear family	159	77.9
		Joint family	28	13.7
		Single parent	17	8.3
6	Marital status	Single	182	89.2
		In relationship	4	2.0
		Married	18	8.8

The Kolmogorov-Smirnov test for normality showed a non – normal distribution of the scores ($P < 0.05$). The mean procrastination Quotient score of the study population was $27.81 + 3.986$. Based on the PQ scales, Majority of the study population were average procrastinators ($n = 142$; 69.6%) and none were non-procrastinators (0%) and only 2 were procrastinators (1%). (Figure 2)

The mean Perceived Stress Scale score and Insomnia Severity Index score were $18.96 + 5.02$ and $10.54 + 5.62$ respectively. 160 students belong to moderate stress group (78.4 %) and only 11 belonged to high stress group according to the PSS score (Figure 3). Clinical insomnia was observed in 44 students (21.6 %) of which 34 were with moderate severity (16.7 %) and 10 were with severe insomnia (4.9%). (Figure 4)

Table 2: scores of the college students according to PQ, PSS and ISI scales (n = 204)

Score	Mean + SD	Median	Interquartile range
Procrastination Quotient	$27.81 + 3.99$	28.00	25.00 – 31.00
Perceived stress scale	$18.96 + 5.02$	20.00	16.00 – 22.00
Insomnia severity index	$10.54 + 5.62$	11.00	6.25 – 14.00

Figure 2: Frequency distribution of the various category of the college students based on the PQ scale (n = 204)

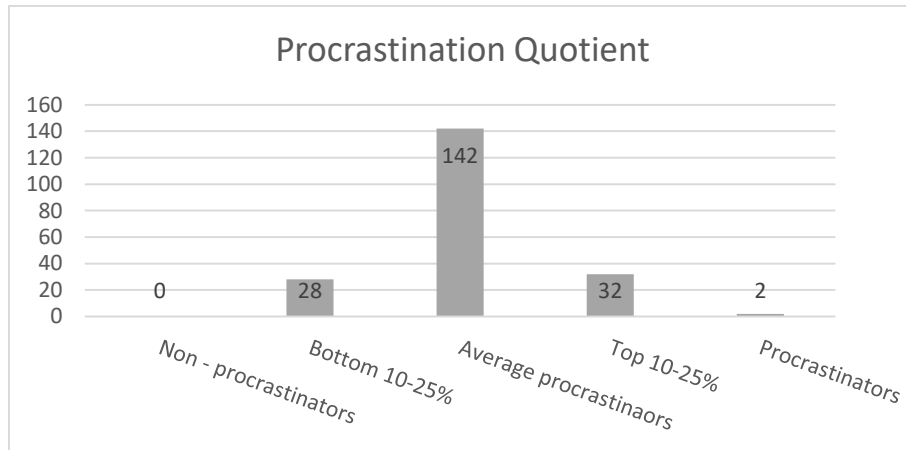


Figure 3: Frequency distribution of the various category of the college students based on the PSS scale (n = 204)

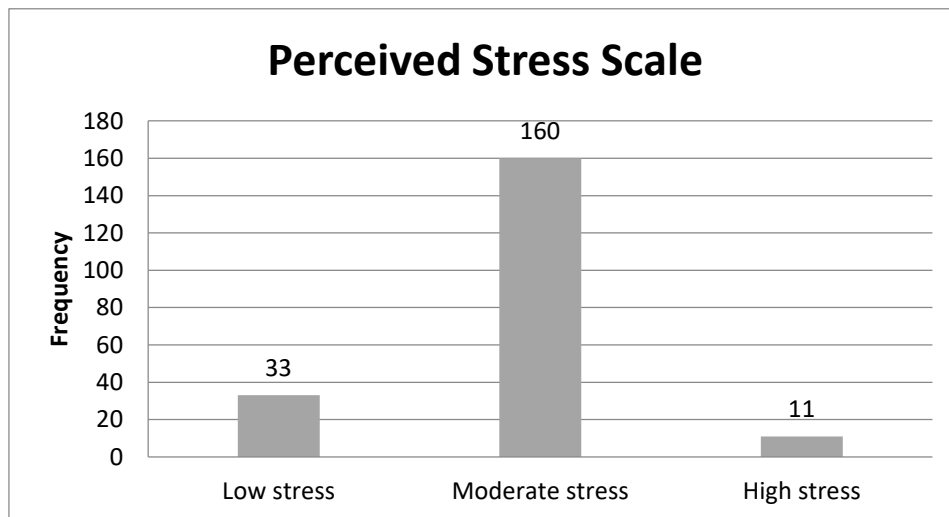
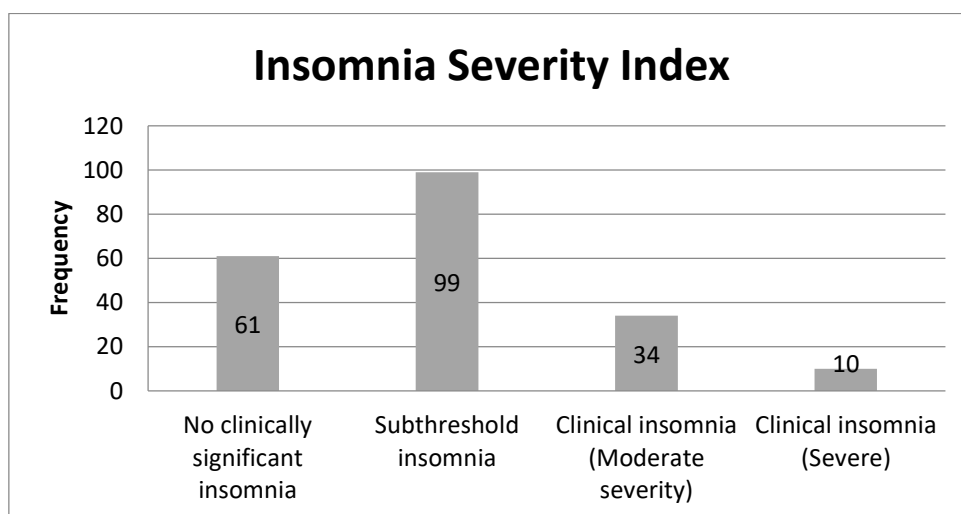


Figure 4: Frequency distribution of the various category of the college students based on the ISI scale (n = 204)



The Chi square test for the goodness of fit shows that based on the percentage, majority of the students studied were average procrastinators (n = 142; 69.6%), with

moderate stress (160, 78.4 %) and with sub-threshold insomnia (99, 48.5%) which is statistically highly significant at the level of $P < 0.001$.

The Mann Whitney test done for comparing the means showed no significant difference between the genders with respect to any of the scores namely PQ, PSS and ISI score. Day scholars showed a higher PQ score compared to that of Hostellers but was not statistically significant.

The Kruskal Wallis test showed that no statistical significance was observed between the course of study with respect to the PQ score though the engineering students had a slightly high PQ score than BSc. Nursing and MBBS students. However, a highly significant statistical difference was noted among the engineering students with regard to ISI score ($P < 0.001$).

No significant difference in the PQ scores was noted with respect to the year of study, nature of residence, family and marital status of the college students. Whereas, students in relationship showed a significant high ISI score compared to the students who are single or married ($p < 0.05$).

Chi square test showed significant association between procrastination and stress which is highly significant at the level of $p < 0.001$. 100 % of the procrastinators showed high stress and only 6.3% of the moderate procrastinators showed high stress.

100 % of the top 10- 25% and bottom 10 -25% of the PQ group showed moderate stress. No significant association was observed between procrastination and Insomnia (Table 3).

Table 3: Chi-square test for association between PQ and PSS, ISI scales of the college students (n = 204)

Procrastination groups	Level of stress based on perceived stress scale			Level of insomnia based on Insomnia Severity Index			
	Low stress	Moderate stress	High stress	No insomnia	Subthreshold insomnia	Clinical Insomnia (moderately severe)	Clinical Insomnia (severe)
Top 10 – 25 %	0 0%	28 100%	0 0%	4 14.3%	15 53.6%	5 17.9%	4 14.3%
Moderate procrastinators	33 23.2%	100 70.4%	9 6.3%	46 32.4%	70 49.3%	22 15.5%	4 2.8%
Bottom 10 – 25%	0 0%	32 100%	0 0%	11 34.4%	12 37.5%	7 21.9%	2 6.3%
Procrastinators	0 0%	0 0%	2 100%	0 0%	2 100%	0 0%	0 0%
Chi-Square Value	57.367			12.950			
P value	<0.001**			0.165			

Figure 5: Distribution of perceived stress category of study participants with respect to PQ category

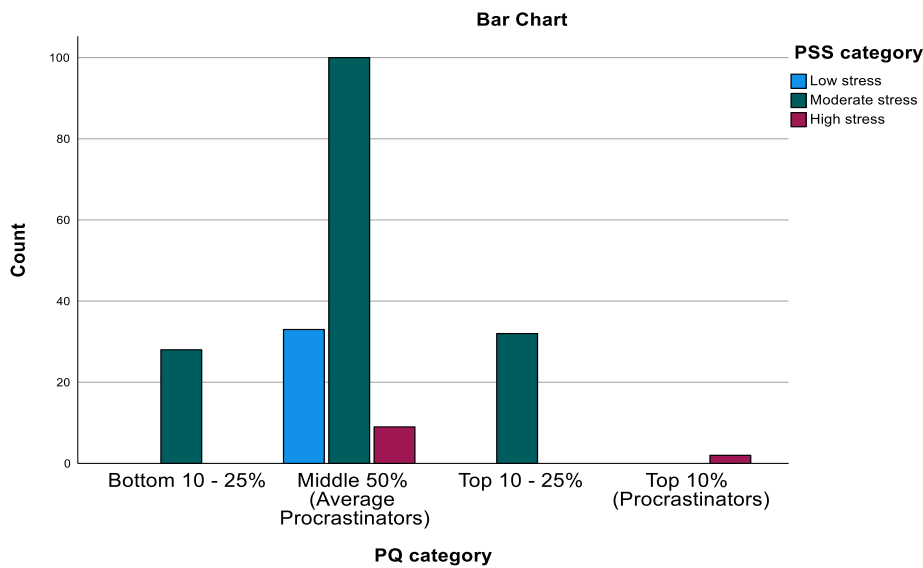
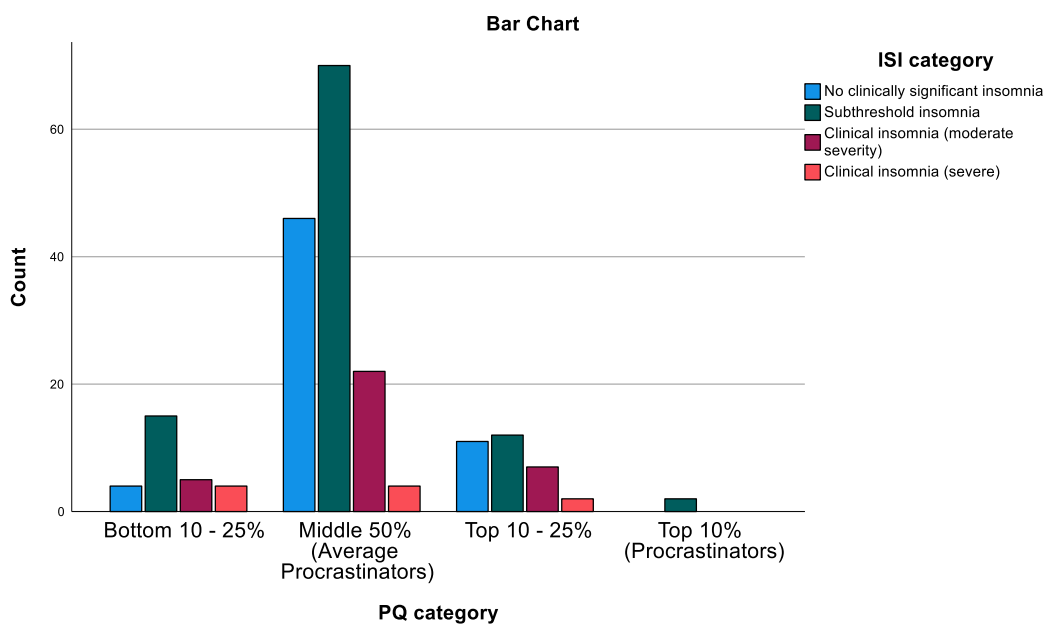


Figure 6: Distribution of ISI category of study participants with respect to PQ category



A positive correlation was noted between the PQ score and PSS score with the spearman rho value of 0.302 which is highly significant at the level of $p < 0.001$. (Figure 7) This shows that higher the procrastination score higher is the stress observed among the college students. No significant correlation was observed between the PQ score and ISI score. A positive correlation was noted between the PSS score and ISI score with the spearman rho value of 0.356 which is highly significant at the level of $p < 0.001$. (Figure 8). This indicates with increase in the level of stress the level of insomnia also increases among the college going students.

Figure 7: Scatter plot showing the positive correlation between the PQ score and PSS score of the college students (n = 204)

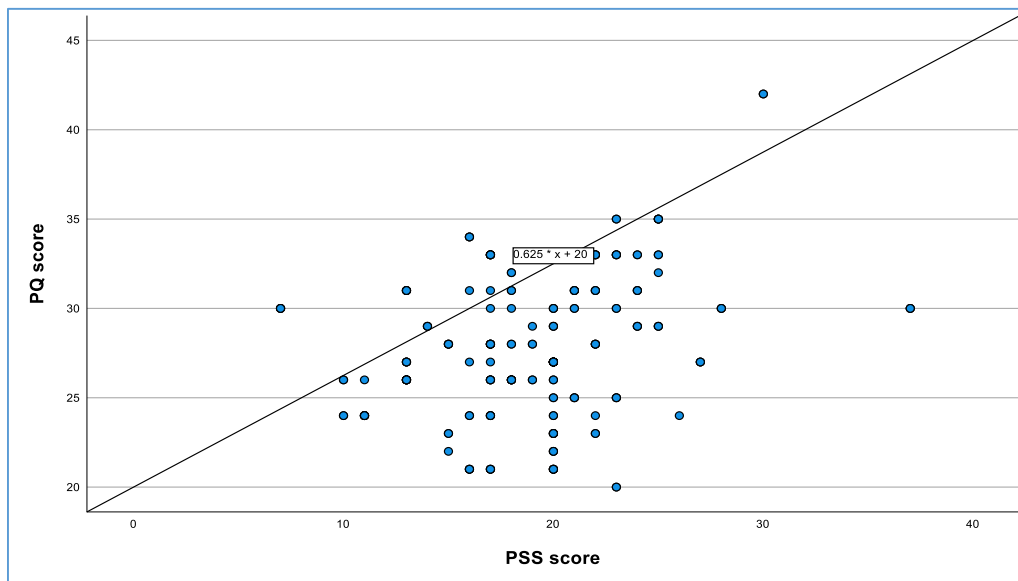
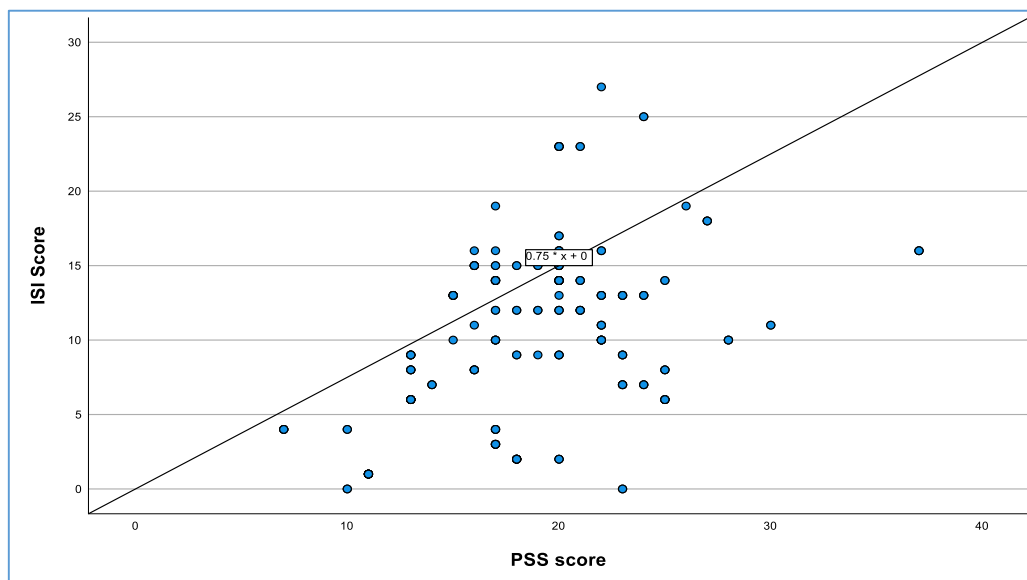


Figure 8: Scatter plot showing the positive correlation between the PSS score and ISI scores of the college students (n = 204)



DISCUSSION

Every person is expected to take decisions in their everyday affairs when they're on the work and otherwise carrying out their social and familial obligations. People who make timely decisions benefit from increased overall effectiveness, higher self-esteem, and meeting deadlines as well as relief from stress, worry, making incorrect decisions, and occasionally economic losses. Delay in making a decision is not only upsetting in the long run, but also quite difficult for general wellbeing of the individual. This study amply supports the notion that a significant portion of students delay making day-to-day decisions. On analyzing the procrastination level, none of the students were non-procrastinators and majority of them were at least average procrastinators. Several series of studies done previously on procrastination indicated that it is very commonly prevalent among college students.(1,11–14).

A meta-analysis study done by Van Eerde et.al.(3) reports that compared to men, women are slightly less prone to be procrastinators. Though previous studies(15,16) in literature shows that males are more commonly associated with procrastination, our study reports that no significant difference was observed between the genders, which is supported by few studies(17–19). Despite the fact that our study found that day scholars and engineering students had higher PQ scores, the results were not statistically significant. There is no room for direct comparison of these results because there have been no studies of a similar nature with these parameters.

On analyzing the association between procrastination and stress, our study reported that there is statistically significant association in chi square test and a positive correlation between PQ scores and PSS scores. This relationship implies that several procrastinators experience stress, both because procrastination can induce stress and because stress can cause procrastination leading to a vicious cycle. Therefore, it's crucial to comprehend how and why procrastination and stress are related to each other, if you wish to minimize both of them and break this vicious procrastination stress cycle. Khalid A et.al.(20) did a study in M.B.B.S students in china on assessing the relationship between procrastination and perceived stress reported that procrastination significantly and positively correlated with the PSS scores. Similarly many other studies are in line with our results.(5, 21–23).

The other purpose of our study was to assess if there is any relationship between procrastination and sleeplessness. It is becoming more widely acknowledged that personality traits and sleep quality are associated in many important aspects. But our study reported that, there was no statistically significant association observed between procrastination and Insomnia, but, there is a statistically significant association observed between perceived stress and Insomnia. Sirois FM et.al.(24) received similar results in their study, they have showed considerable stress-related indirect effects of procrastination on sleep quality. According to their results, procrastination had a moderate and significant effect on sleep quality via perceived stress. Few studies like Hairston IS et.al.(25), have reported direct positive connection between procrastination and sleep disturbance. Another study done by Kühnel J et.al.(26) Reported that inadequate amounts of sleep and low quality sleep at night are more likely causes of procrastination at work. In contrast to our results, a study done by Przepiórka A et.al.(27) Reported that people who suffer from sleep problems are less likely to procrastinate. This may be due to the fact that different scales were used to assess the procrastination and sleep respectively in both studies.

Since it is a self-reporting survey, the main drawback of this research is the response bias, which might cause respondents to give false information in order to have a positive influence, thereby misleading the study's findings. Finally, because the study's findings are based on a small sample size, the study's external validity is limited. Consequently, additional qualitative studies with greater sample size to identify the reasons behind procrastination among college students are required to develop strategies to counteract such negative behaviour.

CONCLUSION

Thus, our study concludes by establishing the positive relationship between procrastination and perceived stress which may indirectly lead to insomnia. The study also assisted in comprehending few fundamental sociodemographic factors that were

associated to procrastination. This result is in congruent with a growing body of evidence demonstrating that the proclivity to put off tasks or decisions may be key risk factors for the onset of stress and sleep disorders. The findings of this study highlights the necessity for an effective coaching programme that motivates and educates the students to focus on minimising procrastination by effective time management and organization skills.

References

- 1) Solomon LJ, Rothblum ED. Academic procrastination: Frequency and cognitive-behavioral correlates. *J Couns Psychol.* 1984; 31:503–9.
- 2) Lay CH. At last, my research article on procrastination. *J Res Personal.* 1986 Dec 1;20(4):474–95.
- 3) Van Eerde W. Procrastination: Self-regulation in Initiating Aversive Goals. *Appl Psychol.* 2000; 49(3):372–89.
- 4) Kim KR, Seo EH. The relationship between procrastination and academic performance: A meta-analysis. *Personal Individ Differ.* 2015 Aug 1; 82:26–33.
- 5) Sirois FM, Melia-Gordon ML, Pychyl TA. “I’ll look after my health, later”: an investigation of procrastination and health. *Personal Individ Differ.* 2003 Oct 1; 35(5):1167–84.
- 6) Dev S. Effects of procrastination behavior, stress tolerance and study habits on academic achievements of Indian Students residing in India (Kerala) and UAE. *Res Soc Sci Technol.* 2018; 3(3):16–31.
- 7) Svartdal F, Steel P. Irrational Delay Revisited: Examining Five Procrastination Scales in a Global Sample. *Front Psychol.* 2017 Nov 3; 8:1927.
- 8) Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983 Dec; 24(4):385–96.
- 9) Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med.* 2001 Jul; 2(4):297–307.
- 10) Madhan B, Kumar CS, Naik ES, Panda S, Gayathri H, Barik AK. Trait Procrastination among Dental Students in India and Its Influence on Academic Performance. *J Dent Educ.* 2012; 76(10):1393–8.
- 11) Balkis M, Duru E. The evaluation of the major characteristics and aspects of the procrastination in the framework of psychological counseling and guidance. *Kuram Ve Uygulamada Egitim Bilim.* 2007; 7(1):376.
- 12) Ellis A, Knaus WJ. *Overcoming procrastination: or, how to think and act rationally in spite of life’s inevitable hassles.* Signet Book; 1979.
- 13) Ferrari JR, Díaz-Morales JF. Procrastination and mental health coping: A brief report related to students. *Individ Differ Res.* 2014; 12(1):8–11.
- 14) Shukla. Assessment of procrastination trait among dental students – A preliminary outlook [Internet]. [Cited 2022 Dec 1]. Available from: <https://www.jiaphd.org/article.asp?issn=2319-5932;year=2020;volume=18;issue=3;page=266;epage=270;aulast=Shukla>
- 15) Lakshminarayan N, Potdar S, Reddy SG. Relationship between Procrastination and Academic Performance among a Group of Undergraduate Dental Students in India. *J Dent Educ.* 2013; 77(4):524–8.
- 16) Steel P. The nature of procrastination: a meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychol Bull.* 2007 Jan; 133(1):65–94.
- 17) Watson D. Procrastination and the Five-Factor model: a facet level analysis. *Personal Individ Differ.* 2001 Jan 5; 30:149–58.
- 18) Hess B, Sherman MF, Goodman M. Eveningness predicts academic procrastination: The mediating role of neuroticism. *J Soc Behav Personal.* 2000; 15(5):61.

- 19) Effert B, Ferrari J. Decisional procrastination: Examining personality correlates. *J Soc Behav Personal*. 1989 Jan 1; 4:151–61.
- 20) Khalid A, Zhang Q, Wang W, Ghaffari AS, Pan F. The relationship between procrastination, perceived stress, saliva alpha-amylase level and parenting styles in Chinese first year medical students. *Psychol Res Behav Manag*. 2019 Jul 3; 12:489–98.
- 21) Wagner SL, Cepeda I, Krieger D, Maggi S, D'Angiulli A, Weinberg J, et al. [Formula: see text]Higher cortisol is associated with poorer executive functioning in preschool children: The role of parenting stress, parent coping and quality of daycare. *Child Neuropsychol J Norm Abnorm Dev Child Adolesc*. 2016; 22(7):853–69.
- 22) Visser L, Korthagen FAJ, Schoonenboom J. Differences in Learning Characteristics Between Students With High, Average, and Low Levels of Academic Procrastination: Students' Views on Factors Influencing Their Learning. *Front Psychol*. 2018; 9:808.
- 23) Musolino E. The Effect of Procrastination and Stress on Low Effort and High Effort Tasks. *Huron Univ Coll J Learn Motiv [Internet]*. 2007 Jan 1 [cited 2022 Dec 2]; 45(1). Available from: <https://ojs.lib.uwo.ca/index.php/hucjilm/article/view/7793>
- 24) Sirois FM, van Eerde W, Argiropoulou MI. Is procrastination related to sleep quality? Testing an application of the procrastination–health model. Walla P, editor. *Cogent Psychol*. 2015 Dec 31;2(1):1074776.
- 25) Hairston IS, Shpitalni R. Procrastination is linked with insomnia symptoms: The moderating role of morningness-eveningness. *Personal Individ Differ*. 2016 Oct 1; 101:50–6.
- 26) Kühnel J, Bledow R, Feuerhahn N. When do you procrastinate? Sleep quality and social sleep lag jointly predict self-regulatory failure at work. *J Organ Behav*. 2016; 37(7):983–1002.
- 27) Przepiórka A, Błachnio A, Siu NYF. The relationships between self-efficacy, self-control, chronotype, procrastination and sleep problems in young adults. *Chronobiol Int*. 2019 Aug 3; 36(8):1025–35.