Research Article

To Text or Not To Text: Self-Perception of Text Message Dependency among University Students in Pakistan and its Relation to Stress

Muhammad Ali Abid[1], Muhammad Ali Rana[2], Muhammad Anas Nayyer[3], Muhammad Anees[4], Muhammad Asad Aqeel[5], Maryam Faisal[6], Maryam Zahid[7], Marrium Chaudhary[8], Masooma Zainab Bokhari[9], Maurish Fatima[10], Faiza Aziz[11], Saira Tariq[12], Muhammad Tufail[13]

(13) University Hospitals of Leicester NHS Trust, United Kingdom.
(1-12) King Edward Medical University Lahore, Pakistan.

Abstract:

Objective:

The study aimed to determine whether there was any correlation between self-perception of text message dependency and perceived stress among university students in Pakistan.

Methodology:

A multi-center cross-sectional study was conducted in the form of an online survey through Google forms and analyzed using IBM-SPSS (Statistical Package for Social Sciences) version 28.

Results:

The regression analysis of data yielded that only 2 parameters of STDS were significant in correspondence with PSS. The p- values for all other parameters were insignificant and implied no correlation.

Conclusion:

Students who send text messages while engaging in a conversation with another person and students who often check the mailbox to see if they have a new text message are more likely to suffer from stress.

Corresponding Author: Muhammad Ali Abid

Supervisor: Dr. Saira Tariq | Department of Community Medicine, KEMU, Lahore

Keywords: Problematic Text Messaging, University Students, STDS, PSS

INTRODUCTION:

With the onset of the age of digitalization, hand-held gadgets have advanced by leaps and bounds. The cheap manufacturing combined with the plethora of features that these smartphones offer has caught the eye of the young and the old alike and have especially garnered the attention of teenagers and young adults. An estimated 1.4 billion mobile phones were sold in the year 2020, despite the COVID-19 pandemic. The mode of communication has shifted to this digitalized world in the form of text messaging (TM) rather than in-person communication. TM has found its way into our everyday lives as an essential component of communication.

The other side of the picture is Problematic Text Messaging (PTM). PTM can be defined as the development of TM into a behavioral addiction that can have profound physical (tiredness) and mental (agitation, insomnia) problems. The use of TM in inappropriate places such as while driving and walking has increased incidences of traffic accidents. PTM is not limited to only the roads and has also been shown to be associated with increased depression, insomnia, and a decrease in levels of executive function.

One of the most frequently used questionnaires to assess the effects of PTM is the Self-perception of Text message Dependence Scale (STDS) developed in 2008. The scale judges the issue of PTM from a three-directional approach: i) Emotional Reaction (ER); ii) Excessive Use (EU); iii) Relationship Maintenance (RM). The preoccupation with the TM is judged by the ER dimension while the EU dimension assesses the self-perception of the participating subject about their own excessive dependence on TM. The RM dimension assesses the strain that the subject feels that not texting would impose on their interpersonal relationships. The STDS shows good internal consistency measured by Cronbach's alpha and good construct validity.

The STDS has not been validated in the setting of Pakistan and this research paper seeks to test its validity among the undergraduate university students of Pakistan, especially with its correlation to the 10-item based Perceived Stress Scale (PSS). Stress has perhaps most aptly been defined as the situation in which an organism is unable to respond appropriately to the demands that its environment places upon it. The PSS(12) consists of an evaluation of how overwhelmed the individual has felt due to their life in the past month. It assesses the current levels of stress and the feelings of stress that have been experienced in the past month.

Since both the STDS (8) and the PSS(12) are scales based on the self-perception of the participating individual about their TM, the paper will be able to find the correlation, if any, between PTM and stress among undergraduate university students in Pakistan. The establishment of a correlation will lead to the development of appropriate measures so PTM can be prevented in undergraduate university students in Pakistan.

METHODS AND METHOD:

Study Design:

A multi-center Cross-sectional study was carried out

in the form of an online survey conducted through Google Forms questionnaires in the Punjab province, Pakistan.

Setting:

Different Universities of Punjab, Pakistan

Duration of study:

The study took place from 1st July 2022 till 31st October 2022.

Sample size:

n = p(1-p) (Z/E)^2

Z= Confidence level is 1.96 for 95%

E= margin of error=0.05 or 5%

P = Population proportion =0.50 (1)

n=384

Sampling Technique:

Snowball Sampling

Sample Selection:

Inclusion Criteria:

- The students who were older than 18 years.
- The students who were currently enrolled in various universities of Punjab and regularly used text messaging apps whether WhatsApp, Instagram and Facebook messenger, Telegram, or Twitter messenger; were included in the study after taking informed consent from them.

Exclusion Criteria:

- Students from schools, colleges, and universities outside Punjab.
- All the graduates and the students who were in gap year were excluded from the study.
- All those students who did not regularly use Text messaging Apps such as WhatsApp, Instagram and Facebook messenger, Telegram, or Twitter messaging have also been excluded from the study.
- Additionally, those belonging to the age group of less than 18 years had also been excluded from the study.

Data Collection Procedure:

An online google questionnaire consisted of three parts, the first part consisted of questions related to the socio-demographics of the population, second part comprised questions based on a short version of the Self-perception of Text-Message Dependency Scale (STDS) (2). The scale helped to assess how people perceived their text-messaging usage as well as their attitude toward obsessive text-messaging in the context of interpersonal relationships. It consisted of three subscales.

I. Perception of emotional reaction
II. Perception of excessive use
III. Perception of relationship maintenance.

Each subscale consisted of items that assessed sensitive responses to the messages, self-perception about compulsive usage of text messages, and the fear of disruption of relationships without text messages. The short version of STDS consisted of 5 items in each subscale that rated on a 5-pointer Likert scale varying from strongly agree to strongly disagree. The third part of the questionnaire was based on questions from the Perceived Stress Scale-10 (PSS-10) (3). PSS is used to measure stress levels

in children and adults aged 12 and above. It assessed how much an individual has found life to be unpredictable, uncontrolled, and overburdening in the past month. It consisted of questions focused on sensations and thoughts from the previous month. On a five-point scale ranging from "never" to "very often", respondents were asked how often they feel a certain way in each situation.

Statistics:

The data was analyzed using IBM-SPSS (Statistical Package for Social Sciences) version 28. The scales were scored and computed according to their scoring guidelines. Frequency and percentage distributions were calculated. The Shapiro-Wilk test was employed to assess the normal distribution of data and subsequently, parametric tests were used for further analysis and the data was normally distributed. Additionally, considering no homoscedasticity and multi-collinearity among independent variables an ordinal logistic regression analysis for each subscale of STDs with scores obtained in PSS was also applied.

RESULTS

There were 393 participants who filled out the questionnaire form and were included in the research. Out of the 393, the majority were female (59.03%). 90.08% of the total participants were based in urban settings, the majority came from households earning Rs. 70,000 or above (69.72%), and 74.81% of the total participants identified as belonging to the upper middle class in society. All of the participants owned mobile phones with the majority (78.12%) using android phones and spending less than one hour (31.30%) texting other people on their phones. The details of the various demographic data have been presented in Table 1.

	Frequency	***Percentage***
Gender		
Male	161	40.97
Female	232	59.03
Residence		
Urban	354	90.08
Rural	39	9.92
Monthly Family Income		
29999 or less	22	5.60
30000 to 49999	35	8.91
50000 to 69999	62	15.78
70000 or above	274	69.72
Class of Income		
Lower Middle Class	86	21.88
Lower class	2	0.51
Upper class	11	2.80
Upper Middle Class	294	74.81
One a Gap Year		
Yes	11	97.20
No	382	2.80
Type of Phone		
Android	307	78.12
Apple	85	21.63
Huawei nova i7	1	0.25
Time Spent on Texting		
1 to 2 hours	113	28.75
2 to 3 hours	67	17.05
3 to 4 hours	38	9.67
4 to 5 hours	31	7.89
Greater than 5 hours	21	5.34
Less than 1 hour	123	31.30

Table 1: The demographic representation of the same population studied

The analysis of data yielded that only 2 parameters of STDS were significant in correspondence with the PSS i.e., the participants who scored high in these 2 parameters were more likely to display a higher level of perceived stress than other participants. While the rest of the parameters remained insignificant. While holding other response variables constant, In the *Excessive Use* section, we observed that the odds of students who send text messages while engaging in a conversation with another person experiencing high levels of stress were 1.32 (95%CI; 0.04, 0.52, p = .022) as compared to other subscales of STDs. in Table 3.

Similarly, in the *Emotional Reaction* section, the odds of students who often check the mailbox to see if they have a new text message experiencing high levels of stress were 1.33(95%CI, 0.23, 0.54, p=0.033). We conclude that the participants who frequently checked their mobile phones to see if they had new notifications about text messages scored higher on the PSS and thus were suffering from enhanced stress due to this activity, as well as those who were more likely to text other people while being engaged in a conversation, were also more likely to be suffering from greater levels of stress as outlined in Table 2. The frequency of people reporting stress according to PSS is summarized

STDS Scale	***Co-efficient***	***Standard Error***	***Z Score***	***Pr>(z)***	***95%CI***	
Emotional reaction						
I feel disappointed if I don't get a reply to my message immediately.	.1853703	.1139526	1.63	0.104	-.0379727	0.4087
I feel anxious when people don't immediately reply to my text message	.0528477	.128881	0.45	0.651	-.1943545	0.3108
I often check my mailbox to see if I have a new text message.	.2831832	.1324981	2.14	0.033	.0234916	0.5428
After sending a text message, I check my mailbox repeatedly to see if I have received a response	-.0894432	.1109055	-0.81	0.420	-.306814	0.1279
I consider myself a quick typist on mobile phones	.0146769	.1021194	0.14	0.886	-.1854736	0.2148
Excessive Use score						

I sometimes send text messages while engaging in a conversation with another person	.2783316	.1211419	2.30	0.022	.0408978	0.51576
I use text messages even while I am talking with friends.	.1867507	.1030273	1.81	0.070	-.0151791	0.3886
I often exchange many text messages in a short period of time	-.1086773	.1101201	-0.99	0.324	-.3245087	0.1071
I sometimes spend many hours text messaging	-.1776213	.1147532	-1.55	0.122	-.4025335	0.0472
I feel disappointed if I don't receive any text messages.	.0061173	.0937911	0.07	0.984	-.1777099	0.18994
Relationship Maintenance score:						
I can't form any new relationships without using text messages	.0288977	.1330525	0.22	0.828	-.2318804	0.2896
I can't maintain new friendships without text messages	.0129756	.137676	0.09	0.925	-.2568645	0.2828
I think my relationships would fall apart without text messages.	.0971393	.1249081	0.78	0.437	.3419546	0.3419
Without text messages, I would not be able to contact friends whom I can't meet on a daily basis.	.1134516	.0902667	1.26	0.209	.290371	0.2903
Without using text messages, I can't say what is on my mind.	.1183924	.1006768	1.18	0.240	.3157154	0.3157

Table 2: Regression analysis between the STDS and PSS

PSS Scale	*Frequency*	*Percentage*
Low Stress	30	22.14
Moderate Stress	276	70.23
High Stress	87	22.14

Table 3: Frequency of participants reporting Low Stress, Moderate Stress, and High Stress as evaluated by the Perceived Stress Scale.

DISCUSSION:

Igarashi and colleagues introduced and first validated the STDS in a sample of Japanese teenagers about ten years ago (1). According to the self-perception theory, people can deduce their attitudes from their conduct (2). Texting has rapidly become a common activity among people of all ages and social classes, having previously been largely associated with affluent adolescents and young adults. To our knowledge, this is the first investigation into whether the STDS is an accurate tool for assessing texting dependence in Pakistani adults. The goal of the study was to determine whether there was any connection between STDS and PSS among Pakistani university students. The factor structure of the STDS is supported by the current findings. Furthermore, the findings indicate that only 2 STDS parameters—those measuring excessive use and emotional reaction—were significantly correlated with PSS.

Our findings highlight the significance of carefully scrutinizing self-report tools used in research, especially those meant to evaluate a habit that is fast evolving, like mobile messaging. Because text-based communication is indirect, fragmented, and less expensive than direct telephone discussions, teenagers prefer text messages to direct telephone conversations. There are relatively few widely used instruments for evaluating texting behavior, even though there is more study being done in this area. To assess psychological dependence on text messaging, this instrument and its subscales may be helpful across age groups, although the instrument itself needs updating, especially the measurement of "extreme use." For instance, the model fit improved the most when item 7 ("I occasionally spend many hours on text messaging") was eliminated (3). In conclusion, the STDS may still be a helpful tool, but as societal standards evolve, its features and item content need to be examined and updated.

One of the three components of STDS is Emotional Reaction. In the Emotional Reaction section of our study, we observed that the p-value for the component “I often check my mailbox to see if I have a new text message” was significant (p=0.033) while the remaining factors remained insignificant. People who are dependent on text messages would pay too much attention to message replies because text messaging is an asynchronous form of communication. Most individuals would assume that a delayed answer was due to inescapable factors, such as the recipient's being preoccupied at work or talking to someone else. People who rely on text messages could feel abandoned or alone if they don't immediately receive a response to their messages, which could heighten their worry about rejection. One element that is commonly investigated as a risk factor for psychological diseases is neuroticism (4). The tendency to feel unpleasant emotions, such as rage, anxiety, self-consciousness, irritability, emotional instability, and despair, is known as neuroticism. People with high degrees of neuroticism react badly to environmental stress, perceive everyday events as dangerous, and may find even slight irritations to be utterly overwhelming (5). It is postulated that neuroticism sets off reliance on text

messaging by escalating peer rejection anxiety, which heightens psychological/ behavioral symptoms. However, because neuroticism and other general personality traits had no discernible effects on the psychological/behavioral symptoms as per studies (1), we can infer that these symptoms are more closely related to the self-perception of text-message dependency or these perceptions rather than the actual number of texts would be possible causes of behavioral or psychiatric illnesses.

We found that "I sometimes send text messages while engaging in a conversation with another person" showed a significant link with stress in the Excessive Use section of STDS, with a p-value of 0.022, while none of the other factors did. Heavy message users may feel that they are overly engrossed in texting and lack self-control because they spend a lot of time messaging throughout the day. On the other hand, there's another group of people who tend to exchange more text messages because they are more interested in other people in their social situations. As a result, they alter their judgment of what constitutes excessive usage so that they can continue to see themselves as ordinary users. These people are referred to as extroverts (6) Thus, we suggest that stress is not solely caused by the frequency of text messages. Instead, the perception of one's dependent conduct would worsen psychological and behavioral problems.

The last component of STDS is the relationship maintenance score. This component didn't yield a positive value on the statistical analysis. We found that the component "I can't form any new relationships without using text messages" and the component "I can't maintain new friendships without using text messages" have shown Insignificant p values of .828 and .925 i.e. the relationship maintenance score is not related to stress on our PSS. Most of the participants in the study believed that face-to-face meetings (7) nurture their relationships whereas the text messages waned their strengths owing to the term they called "relationship gaps (8). Another factor leading to the In-significance of this component in invoking stress among Pakistani Students is the myopic vision of the participants to view relationship maintenance as only romantic relationships (9). Thus, shrinking its dimensions. Moreover, it is widely perceived that progress in relationships can be judged at its best by observing the person's habits at intervals, and via the use of text messages, any individual can easily deceive others (10). Therefore, this factor yielded insignificant results wherein the factors like emotional reaction and the emotional score did play a part in promoting stress among the students.

This study has not been operationalized in Pakistan and while testing its validity among Pakistani Students, our study got some limitations. The major factor limiting the study is the perceived view of stress by individuals. Some individuals don't count their mood swings, disinterest, irritability, and rage as the factors provoking stress. This variability markedly affects the study. Another factor limiting the study is the relationship status of individuals. It was deemed that couples or the one in relationships showed more sensitivity to PSS (5). The language

used in the text messages and the age are also the confronting limitations of the study. On the other hand, our study meets the trophy for some strengths also. The marked strength is to develop a psychic view towards the use of messaging as a communication tool. It assesses the behavior of students, their ups and downs, and how this particular habit of checking the phone again and again (excessive use component) forged their routines. Moreover, our study retained the focus on mobile phone addiction – an emerging issue in the media-savvy and digitalized world. The nexus of messaging and emotional health, relationship maintenance, and stress prevalence are some of the strengths of our study.

The upshot of the above discussion is that the study was conducted to find any possible correlation between STDS and PSS among university students in Pakistan. Our regression analysis showed that the factors like Emotional Reaction and Excessive use showed appreciated results on PSS whereas the factor relationship maintenance score didn't come up on PSS. From these results, the study established an adage that the students who continually visit their mobiles to check for the new message or who wait anxiously for someone's reply are suffering from stress due to the emotional reaction component. Another conclusion is that the strata of students who are used to sending messages while being in conversations with others -Excessive use- also were a victim of stress. Thus, the wide use of text messages is a looming threat to the sound emotional health of students. By the p values on PSS, we can gather that this digitalization is dragging the students into an inexorable future where want for mental peace and emotional stability will be their lot.

ACKNOWLEDGMENTS:

We would like to express our sincere gratitude and appreciation to Dr. Muhammad Tufail, Dr. Saira Tariq and Ms. Faiza Aziz for their unwavering support and assistance in this research work. Their valuable guidance and input have been instrumental in ensuring the success of our publication. We are truly grateful for their contributions.

REFERENCES:

1. Kateryna Hanko. 35+ Must-Know Phone Usage Statistics for 2022 [Internet]. London: Clario Tech Limited [updated: 2022 April; cited 2022 April]. Available from: https://clario.co/-blog/phone-usagestatistics/#:~:text=According%20to%20recent%20data%20from,increase%20in%20users %20by%205%25.
2. Hemmer H. Impact of Text Messaging on Communication. J Undergrad Res Minnesota State Univ Mankato. 2014;9(1):22-29.
3. Pivetta E, Harkin L, Billieux J, Kanjo E, Kuss DJ. Problematic smartphone use: An empirically validated model. Comput Human Behav. 2019;100(8):105–17.
4. Jamil A, Tabassum S, Younis MW, Khan AH, Rehman Z ur, Sanaullah I. Analytical study to find the impacts of using a mobile phone on driver's inattentions while driving – A case study of Lahore. Accid Anal Prev. 2021;157(6): 106132.
5. Clark CA, Harris KM. Smartphone connectivity

stress across generations: Validation of a brief scale for adolescents and adults. Comput Hum Behav Reports. 2021;3(1):12-18.

6. Qanash S, Al-Husayni F, Falata H, Halawani O, Jahra E, Murshed B, et al. Effect of Electronic Device Addiction on Sleep Quality and Academic Performance Among Health Care Students: Cross-sectional Study. JMIR Med Educ. 2021;7(4):1-8.
7. Liese BS, Kim HS, Hodgins DC. Insecure attachment and addiction: Testing the mediating role of emotion dysregulation in four potentially addictive behaviors. Addict Behav. 2020;107(11) :106432.
8. Igarashi T, Motoyoshi T, Takai J, Yoshida T. No mobile, no life: Self-perception and textmessage dependency among Japanese high school students. Comput Human Behav. 2008;24(5): 2311–24.
9. Liese BS, Benau EM, Atchley P, Reed D, Becirevic A, Kaplan B. The Self-perception of Text-message Dependency Scale (STDS): Psychometric update based on a United States sample. 2018;45(1):42–50.
10. Lu X, Watanabe J, Liu Q, Uji M, Shono M, Kitamura T. Internet and mobile phone textmessaging dependency: Factor structure and correlation with dysphoric mood among Japanese adults. ComputHumanBehav.2011;27(5):1702–9.
11. Lu X, Katoh T, Chen Z, Nagata T, Kitamura T. Text messaging: Are dependency and Excessive Use discretely different for Japanese university students? Psychiatry Res. 2014;216(2):255–62.
12. Cohen S. PERCEIVED STRESS SCALE [Internet]. [updated: 1994; cited 2022 Apr 21]; Available from: https://www.das.nh.gov/-wellness/docs/percieved%20stress%20scale.pdf
13. Lazarus RS, Folkman S. Cognitive Theories of Stress and the Issue of Circularity. Dyn Stress [Internet]. [updated: 1986; cited 2022 Apr 22]. Available from: https://link.springer.com/-chapter/10.1007/978-1-4684-5122-1_4