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TRANSLATION AND PSYCHOMETRIC VALIDATION OF DIGITAL ADDICTION SCALE IN PAKISTANI CONTEXT

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ABSTRACT

The last decade of the 20th century is marked by growing literature regarding behavioral addictions. Among them, digital addiction is a phenomenon that has been explored across different cultures (e.g., Dilci, 2019). The Digital Addiction Scale (Kesici & Tunç, 2018), developed in the Turkish culture, has significant implications in an Eastern context. Despite this relevance, DAS has not been validated in Pakistani culture. Therefore, the current study aims to address this gap in literature by translating DAS into Urdu and examining its psychometric properties. The study used a two-phase research design. Phase I involved following MAPI guidelines to translate DAS into Urdu language. Phase II included empirical validation of DAS on a sample of 300 young adults, aged 18-25 years (M_{age}= 21.7, SD = 1.96). The findings of confirmatory factor analysis indicated that the Urdu version had excellent internal consistency (α = 0.90, ω = 0.93). The factor loadings ranged from 0.66 to 0.86. The analysis supported the original factor structure with acceptable fit indices. Both composite reliability and the HTMT ratio confirmed convergent and discriminant validity, respectively. This study establishes the validity and reliability of the Urdu DAS for measuring digital addiction, offering a valuable tool for cross-cultural research and assessment among Urdu-speaking populations.

Keywords: digital addiction, Urdu translation, psychometric validation, confirmatory factor analysis, validity, reliability

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INTRODUCTION

In recent decades, advancements in communication and information technologies have led to a significant breakthrough, making various types of technologies an essential part of everyday life (Hoehe & Thibaut, 2022). The swift development of digital technology has resulted in a rise in undesirable online conduct, often referred to as digital addiction (Kuss & Lopez-Fernandez, 2016). The term "digital addiction" encompasses various forms of digital technology addiction, excessive, persistent, and difficult-to-control engagement with media or digital devices that negatively impact the users' mental and physical well-being. According to Meng et al. (2022), it also includes reliance on social media, smartphones, video games, the Internet, and other such technology. Not all forms of digital addiction involve Internet use; some digital devices can be habitually used offline. (e.g., compulsive offline gaming or excessive engagement with mobile applications that do not require Internet access) (Karakose et al., 2021).

The burgeoning digital landscape, as of February 2025, reveals that a significant majority of the world's population, with 5.56 billion individuals (67.9%), are now internet users, and a substantial 5.24 billion (63.9%) actively engage with social media. This widespread adoption is particularly pronounced among younger demographics, with individuals aged 15 to 24 exhibiting the highest internet usage globally. Notably, young people in Europe lead in internet penetration at 98 percent, considerably surpassing the global average of 79 percent for this age group (Statista, 2025). This pervasive connectivity sets the stage for understanding the prevalence of digital addiction across various forms. Indeed, a comprehensive meta-analysis encompassing 64 countries by Meng et al. (2022) indicates that digital addiction is a considerable global concern, with combined prevalence estimates revealing that 26.99% of the population experiences smartphone addiction, 17.42% social media addiction, 14.22% internet addiction, 8.23% cybersex addiction, and 6.04% game addiction. Collectively, these figures suggest that at least one form of digital addiction may affect approximately one in four individuals worldwide, underscoring the significant public health implications of this growing phenomenon in an increasingly interconnected world.

In Pakistan, the increasing availability of smartphones and internet access has led to a significant rise in digital dependency, especially among young adults and adolescents. Several studies highlight the adverse effects of digital addiction in Pakistan, including sleep disturbances, academic decline, increased anxiety, and impaired social functioning (Zahid & Rauf, 2022). The Pakistani education system has also witnessed a shift toward online learning platforms, especially during and after the COVID-19 pandemic, further intensifying digital dependency (Iqbal et al., 2022). The digital industry necessitates that people of all ages, roughly from seven to seventy, remain connected to digital technologies. Many people who exhibit patterns of addiction associated with digital activities are unaware of or refuse to acknowledge their addiction. In addition, a lot of users find it awkward to use social media and their phones, which they use excessively because it consumes a lot of their time and makes them feel bad about themselves (Ertemel & Aydin, 2018).

FACTORS INFLUENCING DIGITAL ADDICTION

Psychological Factors: Personality traits like impulsiveness, difficulties in managing emotions, and patterns of relating to others are important influences in digital addiction. Research conducted in Spain found that elevated psychological suffering, reduced diligence, and pronounced motor impulsiveness frequently predict widespread problematic internet use and dependency on social media (Sánchez-Fernández et al., 2024). Furthermore, insecure relationship patterns have been associated with increased online addictive behaviors, with people demonstrating insecure attachment being more vulnerable to problematic internet engagement (Salehi et al., 2023).

Cultural and Socioeconomic Factors: Cultural norms and socioeconomic disparities also influence digital addiction patterns. A meta review of collectivistic cultures emphasized that community and tradition may elicit different attitudes toward digital media as compared to individualistic cultures that prioritize innovation (Jolly & Shivani, 2024). According to the existing literature, socioeconomic factors like digital literacy and access to digital technologies amplify the prevalence of digital addiction and its effect on subjective well-being. (Jolly & Shivani, 2024).

Gender Differences: Researchers found significant gender differences across the patterns of digital addiction. It was observed that men were more inclined towards online gaming and internet addiction. On the other hand, women were more prone to social media reliance (Tang et al., 2017; Salehi et al., 2023).

SYMPTOMS OF DIGITAL ADDICTION

According to Petry et al. (2014), unrestrained involvement in digital environments lead to both physical and psychological problems. Long term use of digital forums and internet addiction is associated with biological and psychological problems like heart rhythm irregularities, eye strain, headaches, and sleep disturbances (Yengın, 2019). Prolonged periods of inactivity may lead to posture-related complications like lumbar and neck strain. Additionally, it may lead to psychological issues such as increased anxiety, restlessness, anger, and social disengagement. Academic difficulties, attention deficit disorder, and cognitive processing issues can also have an adverse effect on mental health (Ertemel & Aydın, 2018). Problematic smartphone use, which is defined by an over-reliance on cellphones for communication, entertainment, and information seeking, is one way that digital addiction can appear (Elhai et al., 2017). Kuss et al. (2014) reported that youngsters are more inclined towards using the internet in a destructive manner than the general population. Individuals who experience this kind of dependency may find it difficult to have face-to-face interactions with others in person, concentrate on tasks, and maintain a healthy work-life balance. Therefore, it explains the complicated nature of digital addiction in modern lifestyles.

The existing literature has demonstrated that there is a widespread use of digital and internet addiction among South Asian youth (Al-Mamun et al, 2024; Gautam et al, 2024); however, these studies mainly relied on Western-developed scales that lack linguistic and cultural adaptation. For example, Li et al. (2025) applied the English-language Internet Addiction Test to Chinese adults without validation. It can potentially overlook culture-specific behaviors like greater engagement with local social media platforms, e.g., Weibo etc. Moreover, a large number of regional studies use cross-sectional designs, therefore, limiting insights into the longitudinal progression of internet addiction (Ergün et al, 2023).

Recent studies in non-Western contexts, especially in Pakistan, reveal unique patterns of digital addiction. For instance, Fareed et al. (2024) found a significant negative correlation between social media addiction and usage frequency among young adults, suggesting that even infrequent users may develop addictive behaviors if their engagement is compulsive. Their study also reported a strong positive correlation between social media addiction and aggression, underscoring the emotional dysregulation associated with problematic use. Similarly, Shoukat et al. (2025) found that Pakistani college students with smartphone addiction reported poorer sleep quality, but this relationship was mediated by Bedtime procrastination—meaning smartphone addiction indirectly harmed sleep by encouraging late-night delays, leading to insufficient or disrupted sleep.

Although Li et al. (2025) applied unadapted Western scales to Chinese populations, this issue is even more pronounced in South Asia, this issue is even more pronounced in South Asia, where linguistic diversity (e.g., Urdu, Punjabi) and cultural norms (e.g., familial expectations to remain digitally connected) further limit the validity of English-language tools. For example, a recent study by Fareed et al. (2024) discovered that West made aggression assessment measures failed to apprehend passive-aggressive behaviors prevalent in the WhatsApp groups of Pakistani families. These findings highlight the need for culture-specific psychological tools for digital addiction.

Therefore, the demand for a culture-specific assessment measure makes the Digital Addiction Scale (Kesici & Tunç, 2018) especially useful. The DAS was specifically designed to assess technology dependence across diverse behavioral and cultural contexts. The tool's multi-layered approach is particularly adequate to the digital landscape of Pakistan, where young generation immerse themselves in smartphones, gaming, and binge watching of digital shows. In contrast to platform specific scales Bergen Social Media Addiction Scale, the digital addiction scale addresses a significant shortcoming of prior regional studies.

The Digital Addiction Scale (DAS) was designed to deal with the rapidly increasing issue of digital technology addiction among university students. It was a 19-item instrument with a five-point Likert-type scale which was designed to measure the complex nature of digital addiction in young adults. The scale devise digital addiction as a broader phenomenon covering different digital tools and applications, including smartphones, computers, tablets, gaming, social media, and other digital activities (Kesici & Tunç, 2018).

In its original study, the DAS demonstrated strong psychometric properties. It showed an excellent overall Cronbach's alpha value of 0.874 and acceptable subscale values ranging from 0.695 to 0.845. The DAS depicts an important contribution to the measurement of technology-related behavioral addictions. The development of the digital addiction scale synchronized with the establishment of specialized clinics for digital addiction in Turkey, therefore, emphasizing the growing recognition of this issue as a significant public health concern. (Kesici & Tunç, 2018).

RATIONALE

The problem of digital addiction has been recognized as a global public health hazard. The growing body of literature emphasizes that unregulated engagement with digital media is linked to adverse psychological and social outcomes (Ejaz et al., 2023). Even though the importance of research on digital addiction has been widely recognized, it still remains rather unexplored in non-Western cultures, like Pakistan. Pakistan is the world's 5th fastest-growing country, with an even more swiftly growing digital landscape. According to a survey conducted by Data Reportal (2025), there were approximately 116 million digital users, making up 45.7% of the country's entire population. Moreover, a great majority of these statistics (i.e., 66.9 million) are youngsters aged 18 years and above. In spite of this, there is a shortage of culture-specific, linguistically validated tools to evaluate digital addiction in Urdu Urdu-speaking community, which makes up 75% of the country's population.

The majority of operational scales are developed in Western contexts, which may fail to capture culturally specific behaviors, such as the widespread use of Urdu-language content platforms such as TikTok Pakistan (Shahzad et al., 2022). Moreover, the ever-increasing prevalence of digital addiction among young adults in Pakistan needs culturally adapted assessment tools. Also, the absence of a linguistically validated digital addiction evaluation tool in the Urdu language has created crucial barriers for clinicians, researchers, and educators in our region. Without culturally appropriate measurement tools, accurate diagnosis, effective intervention, and meaningful research on digital addiction among the Pakistani population remain a big challenge. Therefore, by translating and psychometrically ratifying the Digital Addiction Scale in Urdu, this inquiry seeks to close this gap. This research aims to contribute to cross-cultural studies on digital addiction and lay the groundwork for upcoming studies and interventions aimed at Urdu-speaking populations.

OBJECTIVES

- To translate the digital addiction scale into the Urdu language for young adults.
- To establish convergent and discriminant validity of DAS in the Urdu-speaking sample.

In order to achieve these objectives, the study addressed the following research question:

1. Does the Urdu-translated Digital Addiction Scale (DAS) retain the original 5-factor structure in Pakistani context?
2. Does the Urdu Version of DAS demonstrate strong psychometric properties (reliability, convergent/discriminant validity) among young adults in this region?

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METHOD

This study was conducted in two stages. Using an established translation process, phase I involved translating the Digital Addiction Scale from its source language (English) into the target language (Urdu). During phase II, psychometric validation of the translated version was carried out.

PHASE I: TRANSLATION OF DAS

The Standard Linguistic Validation Procedure (Mapi, 2008) was followed for the Urdu translation of the tools. With the scales' author's consent, the translation process got underway.

FORWARD TRANSLATION

The first step in the procedure was to translate the original tool in Urdu. Two bilingual people were provided the tool to translate from a foreign language to a regional language after obtaining permission from the scale's respective creator before doing so. The experts were highly qualified professionals with a PhD and MPhil in applied psychology. Translators were instructed to utilize everyday language and steer clear of technical or literary terminology that the average person might not understand. In order for Urdu to express the same idea, they were requested to translate the things while keeping in mind the context, meaning, syntax, and connotation.

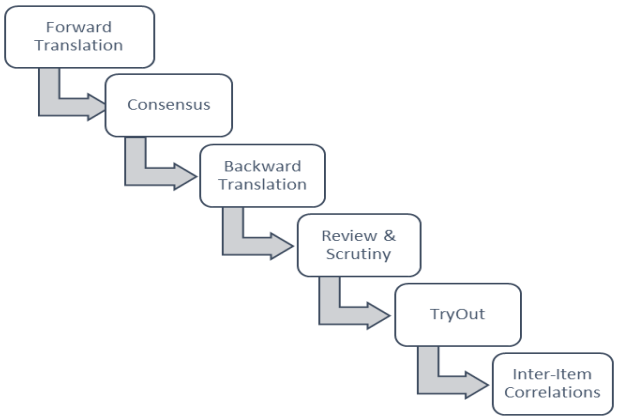


Figure 1: Process of Standard Translation of DAS

CONSENSUS

Following the receipt of the forward translations from the experts, a comparison was conducted to assess conceptual equality, understanding, clarity of expression, and cultural linguistic equivalence. Observations were made and discrepancies between the two translations were noted. The researcher developed an agreement among the translations. Additionally, the supervisor was shown the consensus, which led to additional revisions. After discussing any discrepancies between the two forward-translated versions, the supervisor provided her opinions on two translations in an attempt to address the issue. For each component, the best-formatted sentence was chosen to create a final forward translation version of the scale.

BACKWARD TRANSLATION

Following the researcher's and research supervisor's agreement, a finished Urdu version was created after these adjustments were made. Two other bilinguals were given it to translate backwards, that is, from Urdu to English, without seeing the original English version. One translator held a doctorate in psychology, while the other was a lecturer in the psychology department. The goal was to ensure that the words retained their meaning throughout the translation process and expressed the same idea as they did in the source text. The original English text was then contrasted with their translations. The Urdu translation was modified appropriately if there were any differences in sentence structure. One final Urdu forward translation version was created after addressing the issues found in these backward translations and making a few small adjustments to the scales' Urdu equivalents.

REVIEW AND SCRUTINY

The modifications were also included after backward translations were ready. This version was then given to several specialists who examined the document and identified a few spelling and grammar mistakes. A final version was subsequently prepared for tryout once these were fixed.

TRY OUT

Ten young adults (M_{age} = 21.6, SD = 2.0) in their seventh semester of a four-year bachelor's degree participated in a tryout of the Digital Addiction Scale. They were initially instructed to fill out the English version of the precise same scale. Two weeks later, they were contacted once more and requested to complete the DAS in Urdu. No significant issues with translations were mentioned by the participants. They approved of every translated item. They were aware of each item's intellectual meaning. There were no inconsistencies discovered.

INTER-ITEM CORRELATIONS

Every item on the English version of the Digital Addiction Scale correlated with its Urdu counterpart. The Urdu items were kept whose item-item correlation was greater than.50, and Urdu was rephrased for those whose correlation was less than.50, per Anastasi's (1986) ideal item-item correlation criterion, which states that the magnitude of correlation should be.50 or greater. The item-to-item correlation was computed after another try-out. Consequently, item-to-item correlations for DAS between the Urdu and English versions varied from 0.60 to 0.93. According to reliability studies, the English and Urdu versions of DAS had alphas of 0.85 and 0.87, respectively.

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PHASE II: PSYCHOMETRIC VALIDATION OF DAS

This phase entailed validating the measure, including its rigorous psychometric features, such as validity (convergent and discriminant) and reliability.

SAMPLE

The majority of researchers agree that a larger sample size enhances the reliability and validity of the measurement. Nonetheless, Tabachnick et al. (2018) determined that the sample based on the 10:1 criterion (10 cases per item) would be a perfect fit for validation studies. Considering this criterion, a sample of 300 young adults was gathered for the empirical assessment. These 300 young adults, who included 126 men and 174 women, ranged in age from 18 to 26 (M_{age} = 21.74, SD = 1.96). The sample was conveniently collected from several regions of Punjab, Pakistan. While non-probability sampling limits generalizability, this method was pragmatically necessary due to challenges in accessing rural populations and the lack of a centralized demographic registry. To mitigate selection bias, recruitment channels (e.g., universities, social media, and public spaces) were diversified, and the data were gathered by using both physical (in-person) and online (Google Forms) approaches, ensuring proportional representation of gender and socioeconomic backgrounds. It also allowed the researcher to efficiently gather data from a high-risk demographic (young adults with high digital engagement).

Table 1: Sociodemographic characteristics of participants (N=300)

SOCIODEMOGRAPHIC VARIABLES	DESCRIPTION	M(SD)	FREQUENCY (%)
Age	In years	21.743(1.96)	
Gender	Men		126(42.0)
	Women		174(58.0)
Education	Secondary School		18(6.0)
	High School		27(9.0)
	Bachelor		188(62.7)
	Post Graduate		67(22.3)
Family System	Joint		114(38.0)
	Nuclear		186(62.0)
Usage Time	In hours	5.760(2.73)	

PROCEDURE

The study followed a structured procedure to validate the psychometric properties of the questionnaire. The Institutional Review Committee at the Institute of Applied Psychology, University of the Punjab, Lahore, Pakistan, granted ethical approval. Following that, a varied sample (N = 300) was given the completed Urdu version of the Digital Addiction Scale via online and paper-based surveys. Participants provided informed consent before completing the questionnaire. Data collection spanned 4 months, ensuring adequate representation across demographic groups. Cronbach's alpha was used to evaluate reliability, while confirmatory factor analysis (CFA) was used to examine validity. Additionally, convergent and discriminant validity were investigated. All procedures adhered to APA ethical guidelines.

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RESULTS

Using AMOS (Analysis of Moment Structures) version 23, structural equation modeling (SEM) was employed to analyze the factor structure of the Digital Addiction Scale. The original scale included five factors: overuse, non-restraint, inhibited flow of life, emotional scale, and dependence. 19 items, each with a five-point Likert scale rating, were subjected to confirmatory factor analysis (CFA) in order to validate the translated version. Fit indices for both the initial and modified models are detailed in Table 2.

Table 2: Fit statistics for confirmatory factor analysis of Digital Addiction Scale - Urdu version

MODEL	χ^2	*df*	χ^2/ *df*	CFI	TLI	PNFI	RMSEA	SRMR
Initial Model	268.200	142	1.88	.95	.94	.75	.06	.04
Model Fit	228.083	139	1.64	.96	.96	.75	.05	.04

Note: N = 300; χ2, chi-square (p > .05); CFI= Comparative Fit Index; TLI= Tucker-Lewis Index; PNFI= Parsimony Normed Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual

Fit indices for the Urdu version of the Digital Addiction Scale among Pakistani young adults are detailed in Table 2. The indices for the initial and modified confirmatory factor analysis model showed $X^2(142) = 268.20$, $p < .05$, and $X^2(139) = 228.08$, $p < .05$, respectively, indicating a significant chi-square statistic, which goes against the criteria. Nonetheless, researchers have concluded that using larger samples nearly invariably results in the chi-square statistic rejecting the model since it is sensitive to sample size (Jöreskog & Sörbom, 1993). Researchers have searched for alternative metrics to assess model fit because the model chi-square is so restrictive. A better match was found using Wheaton's normed chi-square statistic (X2/df). According to the suggested criteria, this resulted in values of 1.88 and 1.64 for both models, indicating a good fit ratio for the static (Tabachnick & Fidell, 2007).

For the purpose of assessing the model fit, the researchers advise taking into account a number of other indices such as CFI, TLI, PNFI, RMSEA, and SRMR. According to the defined criteria, CFI and TLI values of 0.95 or greater are regarded as good, whereas RMSEA values have a cut-off close to 0.06, and SRMR values should be 0.05 or below (Hu & Bentler, 1999). As for PNFI, values should be greater than 0.50 to be considered in an acceptable range (Mulaik et al., 1989). Initial model fit estimates were acceptable but not robust enough, necessitating model modifications. In the Urdu version of the Digital Addiction Scale, covariances between the error terms of latent factor indicators were added. As per Tomás and Oliver (1999), survey-based research permits correlating error terms within latent variables. Arbuckle (2012) states that only covariances with a chi-square value change of 4.0 or higher were taken into account. Thus, after this process, the absolute and relative fit indices (TLI, CFI, PNFI, and RMSEA) were compared. After establishing covariance, the model fit's RMSEA and SRMR were .05 and .04, respectively. Contrary to that, the CFI, TLI, and PNFI values were, respectively, .96, .96, and .75. As a result, the model could be applied to the tested data because these indices were strongly fitting.

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Table 3: Confirmatory Factor Analysis for the Digital Addiction Scale (N=300)

FACTORS	ω	AVE	MSV	λ
Overuse	0.87	0.57	0.46	
DAS1				.68
DAS2				.73
DAS3				.78
DAS4				.76
DAS5				.82
Non-Restraint	0.85	0.65	0.46	
DAS6				.77
DAS7				.79
DAS8				.86
Inhibit Flow of Life	0.82	0.54	0.40	
DAS9				.71
DAS10				.80
DAS11				.66
DAS12				.76
Emotional Scale	0.76	0.54	0.39	
DAS13				.68
DAS14				.74
DAS15				.83
DAS16				.69
Dependence	0.93	0.52	0.25	
DAS17				.75
DAS18				.70
DAS19				.70

Note. ω = McDonald's reliability, AVE = Average variance extracted, MSV = maximum shared variance, λ = standardized factor loading

The scale's factor structure was assessed using a Confirmatory Factor Analysis (CFA). Every item's standardized factor loadings were evaluated. The Digital Addiction Scale (DAS) was examined using a confirmatory component analysis based on a five-factor model, which aligns with the measuring framework of the original scale, as indicated in Table 3. The factor loadings above the generally advised cutoff of 0.50, ranging from.66 to.86 (Hair et al., 2010).

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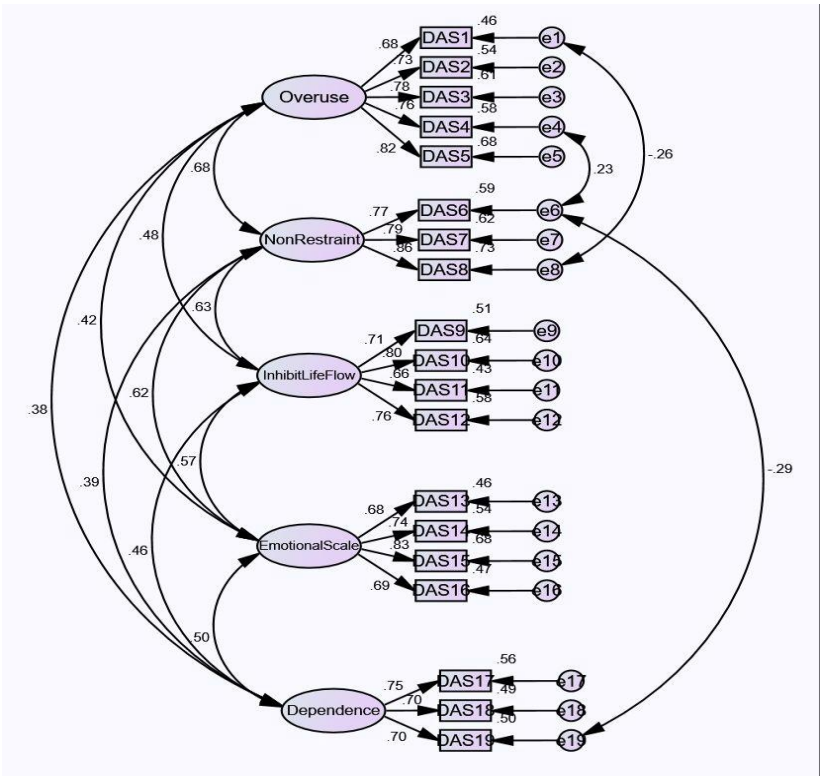


Figure 2. CFA Model of Digital Addiction Scale (DAS)

The reliability, convergent validity, and discriminant validity of the Digital Addiction Scale were the main focus of a Confirmatory Factor Analysis (CFA) conducted to assess its psychometric robustness. Convergent validity was assessed through two indicators, including McDonald's reliability coefficient (ω) and Average Variance Extracted (AVE) for each construct. According to the defined criteria, the value of the McDonald's coefficient should be greater than .70 while the average variance extracted should be above .50 (Hair & Page, 2015; Henseler et al., 2016).
As Table 3 illustrates, ω values (0.76 to 0.93) surpassed the 0.70 threshold for satisfactory internal consistency, and AVE values (0.52 to 0.65) exceeded 0.50, confirming that each construct explained at least 50% of indicator variance. The findings suggest adequate convergent validity, as the AVE values surpass the required threshold.

Discriminant validity was evaluated by comparing AVE and MSV values. For a construct to demonstrate discriminant validity, its specific variance should be greater than the variance it shares with other constructs. According to the criterion outlined by Hair et al. (2010), discriminant validity is supported when the extracted average variance (AVE) is greater than the maximum shared variance (MSV). Following these guidelines, discriminant validity was established, as the extracted average variance (AVE) for all constructs exceeded their maximum shared variance (MSV)

Table 4: Discriminant Validity (Fornell-Larcker criteria & Heterotrait-monotrait ratio) for the Digital Addiction Scale

	1	2	3	4	5
1. Overuse	**.76**	.68***	.48***	.42***	.38***
2. Non-Restraint	.66	**.81**	.63***	.63***	.39***
3. Inhibit Flow of Life	.48	.64	**.73**	.57***	.47***
4. Emotional Scale	.40	.58	.57	**.74**	.50***
5. Dependence	.37	.33	.46	.49	**.72**

Note: Diagonal (bold) = square root of AVE (Fornell-Larcker); Below diagonal = HTMT ratios; ***p < .001.

As presented in Table 4, discriminant validity was determined by applying two significant techniques: the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. In line with the Fornell-Larcker criterion, the bolded diagonal figures show the square root of the Average Variance Extracted (AVE). This criterion suggests that discriminant validity is established when these diagonal values are greater than the correlations among different constructs. The evidence presented here aligns with the Fornell-Larcker (1981) criterion, supporting the presence of discriminant validity. HTMT values positioned below the diagonal remain under the accepted 0.85 threshold, indicating a clear distinction between constructs (Henseler et al, 2016). The results support discriminant validity among the digital addiction scale factors in young adults.

Table 5: Descriptive Statistics and Psychometric Properties of the Digital Addiction Scale – Urdu Version

SCALE & FACTORS	k	M(SD)	CR	MaxR(H)	α
Overuse	5	15.83(5.33)	.87	.88	.87
Non Restraint	3	8.99(3.39)	.85	.85	.84
Inhibit Flow of Life	4	11.50(4.33)	.82	.83	.82
Emotional Scale	4	11.84(4.18)	.82	.84	.83
Dependence	3	10.81(3.09)	.76	.76	.76
DAS Total	19	58.98(15.01)			.90

Note: k= number of items, M (SD) = mean (standard deviation), CR= composite reliability, MaxR(H)= maximum reliability, α= Cronbach's alpha coefficient

The psychometric reliability of the Urdu version of the Digital Addiction Scale (DAS) is detailed in Table 5. Five unique subscales constitute the Urdu Digital Addiction Scale: overuse, non-restraint, inhibit flow of life, emotional scale, and dependence. To evaluate the internal consistency of the underlying constructs, Composite Reliability (CR) and Maximum Reliability (MaxR(H)) were employed in the reliability analysis. The Composite Reliability (CR) for each factor was in the range of 0.76 to 0.87. Since this range is higher than the conventional 0.70 threshold (Hair et al., 2019), it suggests acceptable reliability. Maximum Reliability (MaxR(H)) scores, which represent the highest possible reliability for each construct, were found to be between 0.76 and 0.88. Since MaxR(H) accounts for factor loadings and measurement errors, its higher values suggest that the constructs exhibit strong internal consistency if measured under ideal conditions. The fact that CR and MaxR(H) values are consistent provides evidence for the measurement model's stability and bolsters the reliability of the latent constructs. The findings indicate a remarkably elevated level of reliability across all subscales of the Urdu Digital Addiction Scale (DAS) within a sample of 300 young adults from Pakistan.

DISCUSSION

The use of digital media and related technologies has invaded everyday life of individuals at such a large scale that it has given a rise to certain behavioral patterns. Most of these bear a resemblance to addictive behaviors that can be identified through uncontrollable use of digital devices, signs of withdrawal, and detrimental effects on functional areas of life. Young adults, going through a significant phase of life, are more at risk of falling into this community health liability, known as digital addiction. It can negatively impact their psychological and emotional well-being, educational performance, and social interactions. It is believed that most of the addictions share a similar pattern across different cultures; however, the phenomenon of digital addiction is likely to be determined by distinct social and cultural factors, including the demonstration, experience, and its consequences. There are a number of existing and validated theories of psychology that can help in understanding the fundamental motives that induce digital addiction in young adults of Pakistan. One of them is the Uses and Gratifications Theory by Blumer and Katz, (1974). The theory proposes that individuals have an urge to fulfill a particular set of needs and desires for which they explore and utilize through digital media and related technologies. This explains that youngsters usually indulge themselves in different online platforms in order to fulfill their needs of socialization, recreation, acquiring information, and escape from the tiresome realities of their social and cultural aspects. An additional theoretical framework that elucidates the developmental trajectory of addictive behaviors in relation to digital media is referred to as the Social Learning Theory, as articulated by the eminent psychologist Albert Bandura (1977). This theory postulates that individuals learn specific behaviors by paying attention to their surroundings. Based on this idea, it can be inferred that they can potentially observe their fellows, friends, or any influential figures in their lives indulging in the unrestrained use of digital devices. From that, they might comprehend that such behaviors are socially acceptable or even beneficial, like having an online fan base or a bigger and diverse social circle, therefore, urging them to actively copy these behaviors. Moreover, the swift positive response resulting from these online activities, such as likes and comments, leads to a never-ending cycle of greater engagement and eventually an unhealthy addiction.

For that reason, there is a dire need for an indigenous, reliable, and valid assessment tool for identifying individuals at high risk of getting digital addiction, so that pre-designed interventions can be developed. Eventually, evaluating the efficacy of addiction treatment across a variety of populations. The Digital Addiction Scale accounts for five distinct dimensions. Out of five domains, the first one is called overuse, having five statements. The second one is termed as non-restraint with 3 items. The third subscale has four statements and is known as inhibition of life flow. The second-to-last sub-dimension is referred to as emotional scale, having four items. Lastly, three-item statements make up the domain of dependence (Kesici & Tunç, 2018).

The aim of the current study was to estimate the suitability of the Digital Addiction Scale (DAS) on Pakistani young adults by translating and psychometrically validating it into Urdu. The final results support the use of DAS in Pakistani culture by providing strong evidence of its reliability and validity. The scale originally had a five-factor structure, which was validated by empirical demonstrations. The confirmatory factor analysis (CFA) established an acceptable model fit, which aligned with the existing literature (Kesici & Tunç, 2018). The good model fit indices like CFI, TLI, and RMSEA, and sizeable factor loadings confirmed that the Urdu translated version of DAS is as effective as its English counterpart in capturing the essence of digital addiction effectively.

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Out of the available reliability coefficients, this research used McDonald's omega coefficient to analyze the reliability of the Urdu version of digital addiction scale. The rationale of using this coefficient is grounded in the previous literature, where academicians have found that the most commonly used reliability coefficient, Cronbach's alpha (α), might not illustrate a comprehensive internal consistency (Hayes & Coutts, 2020). Therefore, McDonald's omega (ω) is justified as a more fitting measure of reliability for validation studies.

The psychometric evaluation of DAS denoted that the Urdu version had excellent convergent validity, which was established through the values of Average Variance Extracted (0.52 to 0.65) and McDonald's omega (ω) coefficient (0.76 to 0.93). These findings depict that every single subscale is responsible for at least 50% change in its indicators. It also showed the values of reliability coefficients transcending the existing thresholds of $\omega > 0.70$ and $AVE > 0.50$, therefore having an advantageous internal consistency (Cheung et al., 2024). This discovery is in line with the previous research, which claims that using a number of different validity and reliability indices can help in a comprehensive assessment of psychological instruments (Saeed et al., 2024; Khademi et al., 2024).

The current research incorporated a novel yet well-established measure of assessing discriminant validity in structural equation modeling, known as the Heterotrait-Monotrait (HTMT) ratio. Recent literature claims that this method could be way more effective than traditional criteria. According to a modelling research by Franke and Sarstedt, (2019), the HTMT ratio is a reliable estimate of dis-attenuated correlations between constructs. The results emphasize the use of the HTMT ratio in the assessment of discriminant validity. In order to strengthen the discriminant criteria, the traditional method of Fornell and Larcker criteria was also used in the empirical analysis (Fornell & Larcker, 1981). The findings provided evidence for good discriminant validity. Both convergent and discriminant validity indicated strong construct validity indices, therefore, establishing the construct validity of the Urdu version of DAS.

LIMITATIONS AND SUGGESTIONS

The present study offers invaluable insights into the psychometric properties of DAS Urdu, however, it is crucial to pinpoint and understand the shortcomings. Firstly, this study focused on a certain age group, namely, young adults. So, these findings may have limited application to other age groups. Future researchers should consider a broader sample of adolescent or middle-aged digital media consumers for validation studies. Secondly, the use of non-probability sampling may limit the generalizability of findings to broader populations, particularly rural communities with lower digital access. Future research should employ stratified random sampling to enhance representativeness. Thirdly, self-report measures were used to collect the data, which makes them susceptible to social desirability bias. Integrating objective digital usage metrics (e.g., screen time tracking) could enhance the comprehensiveness of digital addiction assessment. Additionally, further psychometric evaluations, such as test-retest reliability and criterion validity, could improve the overall credibility of the scale.

IMPLICATIONS

This study advances the Interactional Theory of Cultural Adaptation (Kim, 2001) by demonstrating how the global digital behaviors are filtered through collectivist familial norms (e.g., 24/7 WhatsApp family groups) and socioeconomic realities (e.g., gig-work dependence on JazzCash/InDrive). Future studies should test these cultural mediators using the Urdu DAS's subscales. For Urdu-speaking communities, it is proposed that the DAS Urdu has implications in the education sector where teacher training programs can use Urdu DAS scores to flag at-risk students, and digital literacy curricula can be used to address culture-specific triggers (e.g., "How to set boundaries with family chat groups"). It has implications in clinical settings by acting as a screening tool in primary care. Policy makers can use these findings to draft content regulations for Urdu content-dominant platforms like TikTok Pakistan.

CONCLUSION

The Digital Addiction Scale, with its multidimensional approach capturing overuse, non-restraint, life interference, emotional states, and dependence, offers a comprehensive framework for understanding problematic digital technology use beyond platform-specific assessment tools. In conclusion, this research project successfully translated and validated the Digital Addiction Scale from English to Urdu for use with young adults in Pakistan. The rigorous psychometric evaluation with 300 participants confirmed the original five-factor structure of the scale, demonstrating strong structural validity in the target population. The Urdu version exhibited excellent reliability coefficients and established both convergent and discriminant validity, suggesting it maintains the psychometric properties of the original instrument. Therefore, the Urdu version of the Digital Addiction Scale is a reliable psychometric tool for analyzing digital addiction in Urdu-speaking populations. The availability of this culturally and linguistically appropriate measure will facilitate more accurate assessment and research on digital addiction in Pakistan, potentially informing intervention strategies and contributing to the growing body of cross-cultural research on technology use behaviors.

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CONFLICT OF INTEREST

The authors affirm that there are no conflicts of interest in the present research and that neither the study nor its conclusions were impacted by any personal, financial, or professional reasons.

CONTRIBUTION OF AUTHORS

Significant contributions were made by Saba Jamshaid in the areas of conceptualization, methodology, collection of data, formal data interpretation and analysis, paper drafting, and editing.

Farah Malik contributed to refining methodology, formal analysis, supervision, and manuscript review.

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