

Digital Detox as Culturally Embedded Self-Regulation: Development and Validation of a Digital Detox Scale in a Collectivist Cultural Context

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Abstract

Digital engagement is deeply embedded in everyday functioning; however, the psychological meaning of intentional digital disengagement remains culturally underexplored. Existing measures of problematic digital use are largely derived from Western individualistic contexts and emphasize addictive behaviors, potentially overlooking culturally patterned self-regulatory processes. Guided by cross-cultural models of self-construal and self-regulation, the present study developed and validated a Digital Detox Scale (DDS) grounded in the lived experiences of young adults from a collectivist cultural context. Using an exploratory sequential mixed-methods design, qualitative focus group discussions informed item generation, followed by exploratory and confirmatory factor analyses to examine the scale's structure and psychometric properties. Results supported a multidimensional, three-factor structure reflecting digital strain, self-regulatory difficulty, and intentional disengagement and recovery. The DDS demonstrated acceptable internal consistency and preliminary evidence of convergent and discriminant validity. Findings highlight that digital detox is not merely behavioral reduction, but a culturally embedded self-regulatory process shaped by relational obligations and social availability norms. The study advances cross-cultural psychology by illustrating the importance of culturally grounded measurement and provides a foundation for comparative research on digital self-regulation across cultural contexts.

Keywords: Digital Detox; Self-Regulation; Culture; Scale Development; Collectivism

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Introduction

Digital technologies have fundamentally transformed social interaction, academic engagement, and psychological well-being worldwide. While excessive digital engagement has been associated with negative psychological outcomes, the ways individuals regulate digital use and the meaning attributed to disengagement are culturally embedded and context dependent. Despite this, most psychological research on digital overuse and digital detox has emerged from Western, individualistic contexts, where self-regulation is conceptualized as an autonomous, internally driven process (Valkenburg et al., 2022).

Cross-cultural psychology emphasizes that self-regulation is not culturally neutral but embedded within culturally patterned self-construal (Markus & Kitayama, 1991). In collectivist cultures, self-regulation often involves balancing personal needs with relational obligations, social availability and normative expectations. Within such contexts, constant digital accessibility may be perceived as a social responsibility and disengagement from digital platforms may involve psychological costs such as guilt, anxiety, or fear of social disconnection.

However, existing measures of digital overuse and detox predominantly operationalize disengagement as individual behavioral reduction, reflecting Western assumptions about autonomy and self-control. These etic measures may fail to capture emic forms of intentional digital disengagement shaped by relational norms (Berry, 1969). As a result, some observed cross-cultural differences in digital behavior may reflect measurement artifacts rather than substantive psychological variation. Pakistan provides a particularly relevant context for examining culturally embedded digital self-regulation. Characterized by collectivist values, strong family interdependence and increasing digital penetration, Pakistani young adults navigate complex expectations of responsiveness in academic, familial and peer domains. Understanding digital detox within this context offers insight into how culture shapes the structure and meaning of self-regulatory processes in digital life (Owe et al., 2018).

The present study addresses this gap by developing and validating a Digital Detox Scale (DDS) grounded in the lived experiences of young adults in a collectivist cultural context. Using a mixed-methods approach, the study aims to identify culturally salient dimensions of digital detox and examine the psychometric properties of the resulting scale. Although empirically situated in Pakistan, the study's primary contribution lies in advancing culturally grounded measurement and offering a conceptual framework for cross-cultural investigations of digital self-regulation.

Method

Objective

The present study aimed to develop and validate a culturally grounded Digital Detox Scale (DDS) to assess behavioral, cognitive, emotional, and social dimensions of intentional digital disengagement among young adults within a collectivist cultural context.

Research Design

Consistent with best practices in cross-cultural psychology, the Digital Detox Scale was conceptualized as an emic-grounded measure designed to capture culturally salient dimensions of digital detox as experienced by young adults in a collectivist context. The exploratory sequential mixed-methods design was selected to ensure cultural sensitivity in item generation, allowing lived experiences to inform the structure and content of the scale. Guided by self-construal theory, which emphasizes relationally embedded models of the self in collectivist cultures (Markus & Kitayama, 1991), item development focused on capturing digital disengagement experiences shaped by social expectations, relational obligations, and perceived availability norms. Although empirically grounded in Pakistan, the DDS is intended

as a culturally embedded measure with potential etic relevance; with future research needed to examine its cross-cultural equivalence and measurement invariance. The qualitative phase was conducted in two stages, as described below.

Part 1: In the qualitative phase, three focus groups were conducted with a total of 36 university students aged 19–30 years, including both undergraduate and graduate students. Participants were selected using purposive sampling to ensure they were frequent users of smartphones and social media and experienced prolonged screen time, late-night scrolling, or repeated checking. The FGDs were conducted on campus in a quiet setting, each lasting approximately 45–60 minutes. The researcher explained the concept of digital overuse and digital detox, then asked participants about their experiences, device use patterns, psychological, physical, academic and social impacts, and strategies for taking breaks. Discussions were audio-recorded with consent and later transcribed verbatim, maintaining confidentiality.

Thematic analysis was carried out to identify major themes, sub-themes and codes. Two independent experts reviewed the coding for conceptual accuracy and member checking was conducted to ensure participants' experiences were authentically represented. The results of thematic analysis demonstrated that five global themes emerged: (1) Self-Regulation & Over Use, (2) Mental & Physical Impact, (3) Sleep Disruption, (4) Academic Digital Pressure & Burnout, (5) Social Pressure & Interpersonal Impact. These themes reflect culturally embedded experiences of digital engagement shaped by academic expectations, social availability norms and relational obligations characteristic of collectivist settings.

Item Selection Pool

Based on the identified themes, an initial pool of 25 items was generated, covering domains such as self-regulation, compulsive use, mental and physical impact, sleep disruption, academic digital pressure, and social/interpersonal effects. The items were reviewed by three psychology experts for content validity, clarity and relevance. Based on expert feedback, overlapping items were merged, one item was removed for weak conceptual relevance and minor wording revisions were made. Finally, 18 items were selected and retained for the initial draft of the Digital Detox Scale. The items were considered culturally appropriate for Pakistani young adults, and all responses were rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Part 2: Pilot Study: The 18-item scale was administered to a pilot sample of 300 young adults to assess comprehension, clarity and initial reliability. Participants were asked to provide feedback regarding clarity of language, instructions and response format. No significant comprehension issues were reported, supporting preliminary content clarity and face validity. Item responses were recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Pilot data were used for exploratory factor analysis (EFA) to examine the underlying factor structure and to identify any redundant items. Based on statistical and theoretical considerations, two items were removed, resulting in a final 16-item scale.

Phase 2: Validation of the Digital Detox Scale

The validation phase aimed to establish the psychometric properties of the scale among Pakistani young adults. A total of 300 university students (Male = 150, Female = 150), aged 19–30 years ($M = 21.3$, $SD = 2.5$), were selected from public and private universities in Rawalpindi and Islamabad using purposive sampling. Ethical Approval was obtained from the Research Ethics Committee and written and verbal informed consent was obtained from all participants. Participants were assured of confidentiality and the voluntary nature of participation, and university authorities granted permission for data collection. The present study focused on establishing internal structure, reliability, and preliminary validity of the DDS within the

target cultural context; examination of measurement invariance across cultures and genders remains a direction for future research.

Exploratory Factor Analysis (EFA) was performed on pilot data to determine the factor structure of the scale. Factor loadings, cross-loadings and conceptual alignment were examined to finalize the 16-item scale. For factor validation, the dataset was randomly split to examine exploratory and confirmatory factor structures.

Confirmatory Factor Analysis (CFA) was conducted using AMOS 26 to confirm the model fit, with fit indices including Chi-Square (χ^2), Comparative Fit Index (CFI), Normed Fit Index (NFI) and Root Mean Square Error of Approximation (RMSEA) indicating an acceptable model fit.

Reliability Analysis included Cronbach's Alpha, item-total correlations and examination of Cronbach's Alpha if items were deleted to ensure strong internal consistency. Descriptive statistics, correlational analysis and exploratory data checks for skewness and kurtosis were also conducted using IBM SPSS Statistics 25. This rigorous methodological approach ensured that the Digital Detox Scale is psychometrically robust, culturally appropriate and suitable for assessing digital detox behaviors among Pakistani young adults.

Results

Table 1: Descriptive Statistics and Reliability of the Digital Detox Scale (N = 300)

Variable	M	SD	Cronbach's α
Digital Detox Scale	50.90	6.89	.75

Note: M= Mean, SD= Standard Deviation, α = Alpha Reliability, DDS= Digital Detox Scale

Table 1 presents the descriptive statistics and overall reliability of the 16-item Digital Detox Scale (DDS). The mean total score of the participants was 50.90 (SD = 6.89), indicating moderate levels of digital detox behaviors. The Cronbach's Alpha coefficient of .75 demonstrated acceptable to good internal consistency for the initial version of the scale.

Table 2: KMO and Bartlett's Test

Variable	KMO	df	Sig
Digital Detox Scale	.70	153	.000

Note: $p < .001$, df = Degree of Freedom, KMO= Kaiser-Meyer-Olkin

The KMO value of .70 indicated adequate sampling adequacy. Bartlett's Test of Sphericity was statistically significant, $\chi^2(153) = 931.58$, $p < .001$, confirming that the correlation matrix was not an identity matrix. These findings supported the appropriateness of factor analysis.

Table 3: Exploratory Factor Analysis of Digital Detox Scale (N=300)

Sr no	Items	F1	F2	F3
DD5R	I often feel mentally tired after prolonged use of digital devices.	.69		
DD13R	Digital distraction often interferes with my productivity.	.69		
DD9R	Prolonged use of digital devices causes eye strain, headaches, and discomfort in my neck, shoulders, or back.	.64		
DD17R	Spending time online reduces the quality of my in-person relationships.	.59		
DD10R	Using digital devices before bed disrupts my sleep.	.55		
DD7R	I experience stress or anxiety when I am constantly available or reachable online.	.56		



DD14R	I feel the need to disconnect from digital devices due to academic digital demands.	.50
DD8R	Reading too much news or constant digital notifications often overwhelms me and affects my mood.	.49
DD4R	I find it difficult to reduce my screen time even when I try to cut back.	.67
DD2R	I often use digital devices longer than planned, scrolling even when I have no clear reason to do so.	.59
DD3R	I sometimes lose track of time while using social media or other digital platforms.	.57
DD16R	I often compare myself to others on social media.	.54
DD6	Taking breaks from screens helps me feel mentally/physically relieved during the day.	.42
DD11	I sleep better when I avoid screens in the evening.	.59
DD1	I regularly take intentional breaks from using digital devices.	.53
DD18	Limiting digital use helps me reconnect with meaningful relationships and activities.	.52

Note: factor loading > .30

Table 3 presents the results of the Exploratory Factor Analysis, which revealed a clear three-factor structure underlying the Digital Detox Scale. All retained items demonstrated acceptable factor loadings above .40, indicating meaningful associations with their respective factors.

Table 4: Alpha Reliability Analysis

Items	Items Cronbach's Alpha	Factors Cronbach's Alpha
DDS1	.69	
DDS2	.67	
DDS3	.68	
DDS4	.67	
DDS5	.64	
DDS6	.69	
DDS7	.67	
DDS8	.67	
DDS9	.66	
DDS10	.68	
DDS11	.69	
DDS12	.66	
DDS13	.67	
DDS14	.71	
DDS15	.66	
DDS16	.70	
F1	5,13,9,17,7,10,14,8	.75
F2	4,2,3,16,6	.68
F3	1,11,18	.66
Total Scale	.75	

Note: α = Alpha Reliability

Table 4 shows item-wise and factor-wise Cronbach’s Alpha values. Overall, the scale demonstrated strong internal consistency ($\alpha = .75$), with subscale alphas ranging from .66 to .75.

Table 5: Chi-Square, Degree of Freedom and Model Fit Indices of CFA for Digital Detox Scale (N=300)

Indexes	X ²	df	CFI	NFI	RMSEA
DDS (16 items)	33.65	19	.96	.91	.07

Note: x²= Chi-Square, DF= Degree of Freedom, CFI= Comparative Fit Index, NFI= Normed Fit Index, RMSEA= Root Mean Square Error of Approximation.

Table 5 summarizes the model fit indices obtained through Confirmatory Factor Analysis. The results indicate an adequate to good model fit, with CFI and NFI values exceeding recommended thresholds and RMSEA within an acceptable range. These findings support the structural validity of the three-factor, 16-item Digital Detox Scale.

Figure: Path diagram of Digital Detox Scale (16-items) model with item loadings

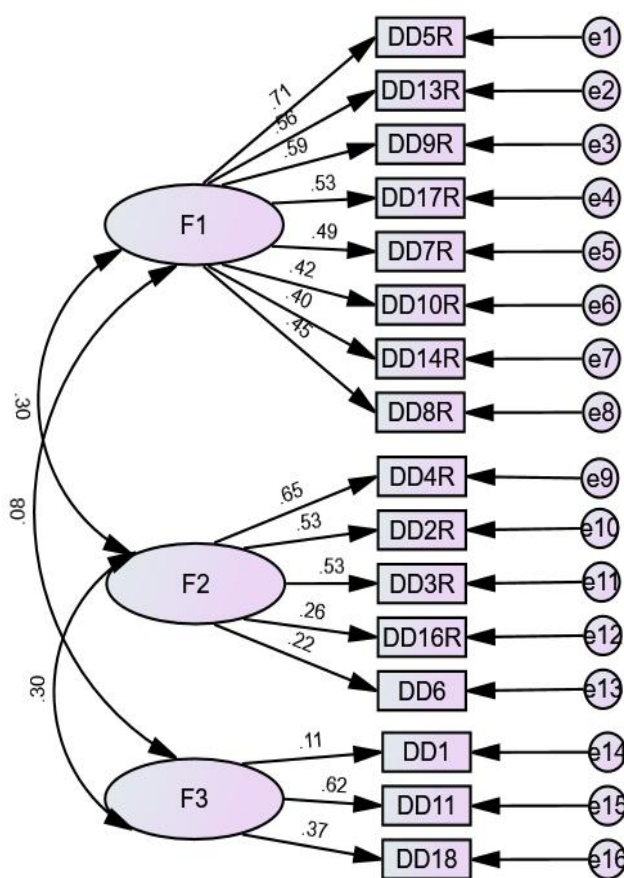


Table 6: Factor Loadings for Confirmatory Factor Analysis of 16 items of Digital Detox Scale (N=300)

Sr. No	Items	λ
1.	I regularly take intentional breaks from using digital devices.	.31
2.	I often use digital devices longer than planned, scrolling even when I have no clear reason to do so.	.53
3.	I sometimes lose track of time while using social media or other digital platforms.	.53



4.	I find it difficult to reduce my screen time even when I try to cut back.	.65
5.	I often feel mentally tired after prolonged use of digital devices.	.71
6.	Taking breaks from screens helps me feel mentally/ physically relieved during the day.	.42
7.	I experience stress or anxiety when I am constantly available or reachable online.	.49
8.	Reading too much news or constant digital notifications often overwhelms me and affects my mood.	.45
9.	Prolonged use of digital devices causes eye strain, headaches, and discomfort in my neck, shoulders, or back.	.59
10.	Using digital devices before bed disrupts my sleep.	.42
11.	I sleep better when I avoid screens in the evening.	.62
12.	Digital distraction often interferes with my productivity.	.56
13.	I feel the need to disconnect from digital devices due to academic digital demands.	.40
14.	I often compare myself to others on social media.	.36
15.	Spending time online reduces the quality of my in-person relationships.	.53
16.	Limiting digital use helps me reconnect with meaningful relationships and activities.	.37

Note: Factor loading > .30, λ = Factor loadings.

Table 6 presents standardized factor loadings for the 16 items included in the Confirmatory Factor Analysis. All items showed loadings above the minimum acceptable criterion of .30, indicating that each item contributed meaningfully to its respective latent construct. This supports the retention of all items in the final scale. Items with comparatively lower factor loadings were retained due to strong theoretical relevance, qualitative grounding, and their contribution to content validity, consistent with recommendations for newly developed scales.

Table 7: Convergent Validity of the Scale

Factors	Standardized Loading (Range)	Cronbach's α	Composite Reliability (CR)	Average Variance Extracted (AVE)
F1	.405 – .713	.75	.75	.38
F2	.219 – .653	.68	.66	.33
F3	.114 – .616	.66	.55	.30

Note: CR = Composite Reliability; AVE = Average Variance Extracted.

Table 7 provides preliminary evidence for convergent validity through factor loadings, composite reliability and average variance extracted values. Composite reliability values were acceptable across all factors, supporting internal consistency. Although AVE values were modest, they are considered acceptable for newly developed psychological scales when composite reliability is adequate (Fornell & Larcker, 1981).

Table 8: Discriminant Validity of the Scale

Factors	F1	F2	F3	√AVE
F1	0.62			0.62
F2	0.30	0.57		0.57
F3	0.08	0.30	0.55	0.55

Note: AVE = Average Variance Extracted

Table 8 demonstrates discriminant validity by comparing the square root of AVE with inter-factor correlations. For each factor, the square root of AVE exceeded the corresponding inter-

factor correlations, indicating that the three dimensions of the scale are empirically distinct. This confirms minimal overlap between constructs and supports the multidimensional nature of the Digital Detox Scale.

Discussion

The present study aimed to develop and validate a culturally grounded Digital Detox Scale (DDS) that captures intentional digital disengagement as it is experienced within a collectivist cultural context. Consistent with cross-cultural psychological theory, the findings suggest that digital detox is best understood not solely as an individual act of self-control, but as a relationally embedded self-regulatory process shaped by culturally patterned expectations of availability, responsiveness, and social obligation.

The three-factor structure of the DDS reflects distinct yet interrelated dimensions of digital self-regulation. The first factor, digital strain and overuse consequences, captures the psychological, physical, and interpersonal costs associated with prolonged digital engagement. This dimension aligns with prior research on digital fatigue and technostress but extends existing work by situating these experiences within culturally normative expectations of constant accessibility. The second factor, self-regulatory difficulty and awareness, reflects challenges in limiting use despite awareness of negative consequences, consistent with self-regulation models that emphasize monitoring and control processes. Importantly, this factor does not pathologize use but highlights culturally situated tensions between personal well-being and perceived social or academic demands. The third factor, intentional digital disengagement and recovery, captures proactive efforts to disconnect in order to restore psychological balance and relational engagement, underscoring that digital detox may function as a culturally meaningful coping strategy rather than mere avoidance.

From a cross-cultural perspective, the DDS demonstrates how self-regulation processes are embedded within interdependent self-construal. In collectivist contexts, self-regulation often involves negotiating personal needs alongside relational responsibilities. The present findings suggest that disengagement from digital platforms may carry psychological costs, such as guilt or anxiety about social disconnection, while simultaneously offering opportunities for restoration and relational reconnection. This duality may be underrepresented in Western-developed measures that conceptualize digital detox primarily as autonomous behavior change.

The psychometric findings provide initial support for the reliability and validity of the DDS. Although some average variance extracted (AVE) values were modest, composite reliability indices were acceptable, which is common in newly developed scales assessing complex, culturally embedded constructs. Retention of theoretically meaningful items with slightly lower loadings was justified by their grounding in qualitative data, consistent with best practices in early-stage scale development within cross-cultural research. Discriminant validity results further supported the multidimensional structure of the scale, indicating that the identified factors represent empirically distinct aspects of digital detox.

The study makes a substantive contribution to cross-cultural psychology by demonstrating the value of emic-informed measurement. Rather than assuming universal meanings of digital disengagement, the DDS illustrates how cultural norms shape both the experience and regulation of digital use. As such, the scale offers a framework for future comparative research examining whether the psychological costs and benefits of digital detox vary across cultural contexts characterized by differing self-construal, social norms, and technological expectations.

Conclusion and Implications

The DDS represents a preliminary validated, culturally relevant measure for evaluating digital detox behaviors in young adults. The scale can be used to assess the frequency and intensity of digital strain, compulsive device use, and intentional disconnection efforts. Additionally, the DDS may serve as a valuable tool for cross-cultural investigations, potentially enabling comparisons of digital detox behaviors across diverse cultural and educational contexts.

Implications of the scale are both theoretical and practical:

Theoretical: The DDS advances understanding of digital behavior by integrating multiple dimensions—psychological, behavioral and social—into a single framework. It highlights the interrelation between digital overuse, mental and physical strain and proactive digital disengagement strategies.

Practical: The DDS can inform interventions aimed at promoting digital well-being. University counseling centers, mental health practitioners and educational institutions can use the scale to identify students at risk of digital strain and design evidence-based programs, such as structured digital detox sessions, mindfulness practices and time-management strategies.

While the present study is situated within a single cultural context, this emic focus aligns with best practices in cross-cultural research. Future studies should examine the DDS across diverse cultural groups to assess measurement invariance and to explore whether the psychological costs and benefits of digital detox vary as a function of cultural values, self-construal, and social norms. Such work would further clarify the role of culture in shaping digital self-regulation in an increasingly connected world.

Limitations and Future Directions

Several limitations should be acknowledged. The sample consisted of university students from a single cultural context, which may limit generalizability. Self-report measures are also subject to social desirability and recall biases. Future research should examine the measurement invariance of the DDS across cultures, genders, and age groups to establish its cross-cultural applicability. Longitudinal and experimental studies may further clarify causal relationships between digital detox and psychological well-being. Additionally, integrating the DDS into intervention research may help identify culturally responsive strategies for promoting digital well-being.

Compliance with Ethical Guidelines.

Informed consent was obtained from all adult participants included in the study. Participants were assured of confidentiality and anonymity of the information provided. In addition, the Ethical Committee of Foundation University Islamabad approved the research design to ensure that the ethical requirements of the study were fulfilled completely.

Disclosure Statement. Authors have no conflict of interest.

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Digital Detox Scale

Instruction: Respond to each item by indicating how much you agree or disagree using a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree.

Sr No	Items	1	2	3	4	5
1	I regularly take intentional breaks from using digital devices.					
2	I often use digital devices longer than planned, scrolling even when I have no clear reason to do so.					
3	I sometimes lose track of time while using social media or other digital platforms.					
4	I find it difficult to reduce my screen time even when I try to cut back.					
5	I often feel mentally tired after prolonged use of digital devices.					
6	Taking breaks from screens helps me feel mentally/ physically relieved during the day.					
7	I experience stress or anxiety when I am constantly available or reachable online.					
8	Reading too much news or constant digital notifications often overwhelms me and affects my mood.					
9	Prolonged use of digital devices causes eye strain, headaches, and discomfort in my neck, shoulders, or back.					
10	Using digital devices before bed disrupts my sleep.					
11	I sleep better when I avoid screens in the evening.					
12	Digital distraction often interferes with my productivity.					
13	I feel the need to disconnect from digital devices due to academic digital demands.					
14	I often compare myself to others on social media.					
15	Spending time online reduces the quality of my in-person relationships.					
16	Limiting digital use helps me reconnect with					



	meaningful relationships and activities.					
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- Items that are negatively worded (items 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, and 15), reverse scoring should be applied before calculating the total score.

(For using this scale, permission from authors is mandatory)