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User Acceptance of Social Media-Backed Digital Detox Apps: Exploring the Role of Personality Traits in Pakistan's Digital Landscape

Sohaib Uz Zaman[1], Adina Sabih[2], Syed Hasnain Alam[3], Muhammad Hassan Kamal[4]

Article Details

Key words: Digital detox, behavioral intention, personality traits, mobile apps, Pakistan, social influence, digital well-being

Sohaib Uz Zaman
Assistant Professor, Karachi University Business School, University of Karachi, ORCID: https://orcid.org/0000-0002-0135-3292, sohaibuzzaman@uok.edu.pk
Adina Sabih
Karachi University Business School, University of Karachi, adinasabih@gmail.com
Syed Hasnain Alam
Karachi University Business School, University of Karachi, ORCID: https://orcid.org/0000-0002-5008-7365, hasnainalam@gmail.com
Khurram Shahzad
Assistant Professor, Faculty of Management Science, Ilma University,
RCID:https://orcid.org/0009-0005-5257-21208 ,
dr.khurram@ilmauniversity.edu.pk

ABSTRACT

In order to investigate the influence of the factors on the acceptance and usage of the social media based digital detox Apps, the study considers the moderating factors of the personality traits in the digital landscape of Pakistan. In view of the growing digital addiction (particularly among the youth), this research fills a gap in understanding the behavioral intention towards the adoption of detox app in the emerging economy. Constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions and personality trait (openness, extraversion and neuroticism) were measured using the structured questionnaire. Partial Least Squares Structural Equation Modeling (PLS-SEM) was done in SmartPLS 3 for analysing the data. This study results showed that performance expectancy ($\beta = 0.86$), social influence ($\beta = 0.89$), and effort expectancy ($\beta = 0.76$) had significant effects on behavioral intention, and that behavioral intention had significant impacts on actual usage behavior ($\beta = 0.75$). It found that personality traits exerted little or no direct influence, but a via-medium role. R^2 values for intention and usage of the model equaled 0.57, giving it strong explanatory power. It thus develops a cultural reasoning for digital wellness behavior integrating psychological and technological constructs. It provides practical advice for app developers and policymakers in the mental health sector in emerging markets.

INTRODUCTION

Currently, social media has a significant influence on behavior, communication, and other issues of our everyday life such as digital addiction and mental health problems (Nguyen, 2022; Recskó & Aranyossy, 2024). In response to these challenges, digital detox applications have been developed with the aim of assisting users in managing the time spent on the screen and adhering to healthier ways with the environment (Schmuck, 2020; Syvertsen & Enli, 2020). In Pakistan, culture plays an important role in the acceptance of these apps, just like it does for personality traits to influence technology adoption (Nguyen, 2022). Subsequent to the above, the Unified Theory and Acceptance and Use of Technology (UTAUT) framework further explain causes of app consumption focusing on performance expectancy and social influence (Recskó & Aranyossy, 2024; Venkatesh et al., 2003).

As stated above, the COVID-19 pandemic has made the digital platforms increasingly relied on, and that too on digital detox apps (Beaunoyer et al., 2020; Nguyen, 2022). However, despite global research, very few studies focused on Pakistan and thus, this research intends to fill the gap of that with an adoption research of the digital apps of digital detox among the Pakistani users (Recskó & Aranyossy, 2024). There is an industry that some refer to as a digital detox industry and they worry about too much screen time have a bad effect on the mental health, that is why (Nguyen, 2022; Recskó & Aranyossy, 2024). With the increase of mobile applications such as "digital Wellbeing" and "StayFree", especially among the youth, we are seeing an increase of cases (Ahmed et al., 2023; Nguyen, 2022).

Recskó & Aranyossy (2024) also note that the corporate and educational sectors have started to realize the necessity of digital detox strategies for bettering well-being and productivity. These workplace and schools initiatives serve to enhance the use of technology at a balanced level (Khan & Shah, 2023; Iqbal & Javed, 2023). Furthermore, government and NGOs are in the process of building awareness campaigns and community program on digital well-being (UNESCO, 2023; PTA, 2023). It can serve as a way of tailoring interventions for having healthier digital habits in the digital space Pakistan is becoming.

LITERATURE REVIEW

User behavior in the adoption of digital technology has been extensively researched in terms of performance expectancy, effort expectancy, socially influence, and facilitating conditions

(Venkatesh et al., 2003). The Unified Theory of Acceptance and Use of Technology (UTAUT) considers these constructs as the basic foundation for explaining technology acceptance in virtually any context, hence, it has been widely used to understand the nature of technology acceptance in various contexts. In relation to digital detox applications, these constructs serve as a theoretical framework that helps us understand the factors that influence uptake by users in culturally nonhomogeneous environment such as Pakistan (Nguyen, 2022; Recskó & Aranyossy, 2024).

According to Venkatesh et al. (2003), Performance Expectancy relates to the level at which an individual perceives that using a certain technology enhances productivity. In the case of digital detox apps, performance expectancy is the perception of how these applications can lead to better functioning on the mental health of users, their productivity, and overall well-being. Studies have been recent which has shown how digital detox apps can positively affect the decline in screen time and improving focus (Ahmed et al., 2023; Tran et al., 2021). This construct also represents older studies that also support this construct as they pay attention to the role of perceived usefulness in technology adoption (Davis, Devaraj et al., 2008). H1 says that performance expectancy influences behavioral intention directly.

According to Venkatesh et al. (2003), Effort Expectancy is the ease of use of a technology. The more people perceive a technology to be easy to use, the greater will be user acceptance (Nguyen, 2022). For instance, the effort expectancy within digital detox apps includes how user interface and navigation of the app are designed to simplify the user experience (Lin et al., 2020; Hussain et al., 2022). Davis et al. (2015) demonstrated in previous research that by theories of adoption, the more effort expectancy there is associated with a technology, the greater the chances of widespread adoption. In the framework, effort expectancy (H3) influences behavioral intention, and neuroticism (H9) influences effort expectancy as well.

In Social Influence, individuals perceive how important others believe that they would use a given technology (Venkatesh et al. 2003). In countries (as is Pakistan) where the social norms and peer influence dominate the behavior, social influence can be crucial in adoption of the digital detox app (Nguyen, 2022; Rehman & Ali, 2022). Research shows that a potential to form recommendations from friends, family and colleagues has a profound effect on the decision

to use technology, especially in contexts where people have a more collectivistic culture (Chuang & Liao, 2021; Syvertsen & Enli, 2020). H2: that is social influence affects BIP and H6: it is affected by openness and H7: extroversion.

According to Venkatesh et al. (2003), Facilitating Conditions are the amount to which the individual considers that the organizational and technical infrastructure for the usage of a technology is available. For case of digital detox apps, such elements include the smartphone compatibility, the internet access, and the availability of the technical support (Ahmed et al., 2023; Nguyen, 2022). Researches have shown that strong facilitating condition can increase the confidence of the user and reduce the barriers of technology adoption (Barnett et al., 2015; Devaraj et al., 2008). Behavioural intention is directly affected by facilitating conditions (H4).

In addition to this, Psychographical Factors, especially neuroticism, extroversion and the degree of openness to experience, are also important determinants of technology utilization behaviors (Nguyen, 2022; Recskó & Aranyossy, 2024). Based on the Big Five Personality Traits model there is a strong framework to understand the effect of individual differences on technology acceptance (Barnett et al. 2015; Devaraj et al. 2008). Recent studies have shown that only personality traits can be taken into account while making digital detox app use models (Hussain et al., 2022; Rehman & Ali, 2022). Social influence and effort expectancy are influenced by openness (H6), extroversion (H7, H8) and neuroticism (H9) and that affects the behavioral intention.

Understanding technology adoption is based on the behavioral intentions and usage behavior. Usage behavior (H4) is directly influenced by behavior intention, so different intention to make use of digital detox apps means different real use of them. This relationship is drawn from extensive research in technology acceptance models (Venkatesh et al., 2003; Nguyen, 2022).

INTRODUCTION TO THEORIES

In order to fathom the adoption of digital detox applications, it is necessary to have an abstract that stresses the complexity of human behavior in the use of technology. Among those models, the first of which is the Unified Theory of Acceptance and Use of Technology (UTAUT), which has been one of the most influential in this domain is, showing the effect of performance expectancy, effort expectancy, social influence and facilitating conditions on behavioral

intention and actual usage (Venkatesh et al., 2003; Abbad, 2021). Since this model has been widely applied in a variety of contexts including mobile applications, health related technologies, social media platform, it is relevant to address this adoption issue in Pakistan in digital detox app (Nguyen, 2022).

The Theory of Planned Behavior (TPB) specifies the importance of attitude, subjective norms and perceived behavioral control in predicting behavioral intentions (Ajzen, 1991; Armitage & Conner, 2001) and is therefore, used as salient framework. However, TPB has successfully predicted technology adoption behavior for health purposes, as well as socially influenced contexts (Nguyen, 2022; Hussain et al., 2022). TPB explains how social pressure and self-efficacy influence consumers' intention of using technology that seeks to reduce screen time. Barnett et al. (2015), Devaraj et al. (2008) among others, emphasize the role of individual differences in technology adoption using The Big Five Personality Trait Model. By doing this, this model deemed five gold pillars: openness, conscientiousness, extraversion, agreeableness, and neuroticism—they indicate the personalities through which people engage with the technology. This study is made valuable by recent research indicating that personality traits have significantly profound impact on the adoption of digital health tools and mobile applications (Nguyen, 2022; Rehman & Ali, 2022). The study seeks to understand these related from the mechanisms that drive the use of digital detox apps in a culturally diverse setting.

SUPPORTING AND NEGATING VIEWS

Researchers examine digital detox application adoption using many different theories which provide different views into user actions. Single-variable research analyzes technology adoption based on performance expectancy and effort expectancy separately from Venkatesh et al. 2003 and Davis 1989. These models show that determining useful perception accurately predicts how users behave when using technology alone. The study by Tran et al. (2021) proved that performance expectancy by itself determines how users embrace technology.

MEDIATION AND MODERATION VIEWS

In collectivist cultures of Pakistan such as social influence clearly bridges performance expectancy to behavioral intention (Venkatesh et al. 2003; Nguyen 2022). The impact of performance expectancy grows stronger because users trust the views of people they know when they review digital detox applications (Ahmed et al., 2023). People become more positive

about technologies they see as helpful when they have positive social experiences in similar studies (Barnett et al., 2015).

Recent research shows that social influence does not necessarily affect how performance expectancy influences user decisions particularly for people who make decisions through their own judgment because of strong self-efficacy (Devaraj et al., 2008; Syvertsen & Enli, 2020). When people value their independence they can develop behavioral intentions from performance expectancy only (Rehman & Ali, 2022). The middle position of social influence in influencing behavior shows differences based on cultural and personal characteristics of people.

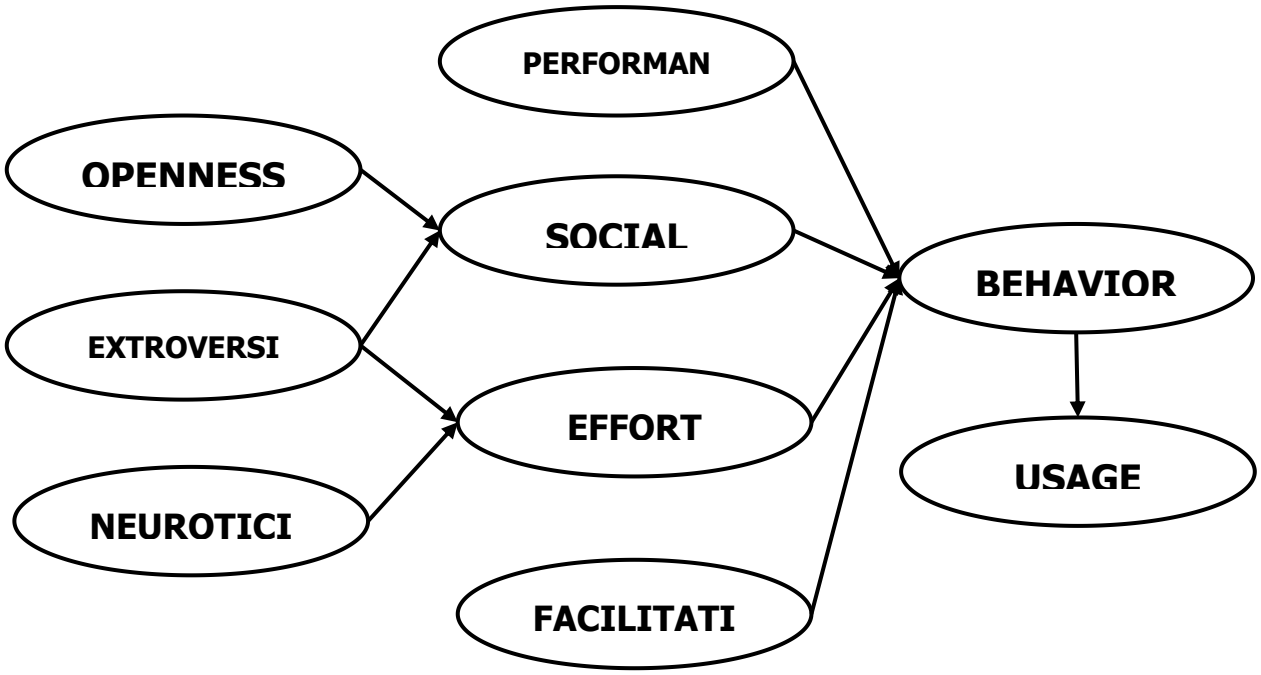

FIG 1.1 CONCEPTUAL FRAMEWORK

HYPOTHESIS DEVELOPMENT

PERFORMANCE EXPECTANCY AND BEHAVIORAL INTENTION

Performance expectancy defines how someone believes technology will help them achieve better results according to Venkatesh et al. (2003). People judge digital detox applications based on their capacity to improve workplace performance while promoting mental health and good living (Nguyen, 2022; Ahmed et al., 2023) according to performance expectancy. The more people see positive results from an app they want to use the app (Barnett et al. 2015). User assurance that Digital Detox App aids in lowering screen usage and improving focus

strongly impacts their adoption patterns according to research from Tran et al. in 2021.

Digital well-being growth in Pakistan as well as other developing economies makes performance expectations essential for technology acceptance decisions. People select digital detox apps because these products help them think better and work more efficiently (Rehman & Ali, 2022). Performance expectancy determines how users respond to digital detox applications so this relationship becomes our central research idea.

H1): Performance expectancy has a positive impact on behavioral intention to use digital detox applications.

EFFORT EXPECTANCY AND BEHAVIORAL INTENTION

Effort expectancy refers to the ease of use associated with a technology (Venkatesh et al., 2003). For digital detox apps this construct shows how easy users find the app based on their expectations (Nguyen, 2022). Users tend to adopt applications that display simple design choices and straightforward working procedures (Ahmed et al. 2023). Research shows users who find a technology simple to operate develop stronger adoption intentions and continue using the technology according to Hussain et al. (2022).

When technological knowledge differs across groups users strongly base their future behavior on how simple an app is to use. Users in Pakistan adopt technology based on this feature because they have unequal computer knowledge across the country (Rehman & Ali, 2022). Our study team wants to know how comfortable systems help users intend to act with them.

(H2): Effort expectancy has a positive impact on behavioral intention to use digital detox applications.

SOCIAL INFLUENCE AND BEHAVIORAL INTENTIONS

People use technology when they sense major people around them think they have to get started with it (Venkatesh et al., 2003). People with families and communities who shape their choices in Pakistan depend heavily on what others think to adopt technology (Nguyen, 2022; Ahmed et al., 2023). People develop favorable app adoption intent when their digital detox use gets backed by their friends and family members (Syvertsen & Enli, 2020).

Consistency of social influence depends on how strongly someone identifies with their traits and their reliance on technology. People in collectivist societies follow social rules when

accepting technology whereas in individualistic societies they adopt based solely on personal interests (Rehman & Ali, 2022). This research introduces the following hypothesis based on these findings.

H3: Usage of social pressure helps people develop a stronger desire to use digital detox applications.

FACILITATING CONDITIONS AND BEHAVIORAL INTENTION

Use of technology depends on how much an individual believes available resources and help will enhance their ability to use the device (Venkatesh et al. 2003). Users need easy access to digital detox applications on these devices plus technical assistance plus user-friendly functions according to Nguyen (2022). Actual usage of technology depends on facilitating conditions because they produce the platform that users need to adopt new technologies (Ahmed et al., 2023).

Research reveals people cannot use new technology as planned when necessary support is missing from their environment according to Hussain et al. (2022) and Barnett et al. (2015). The absence of proper smartphone and internet connections creates major obstacles for people in Pakistani developing areas. Facilitating conditions impact technology adoption behavior according to this research proposal.

(H4): Facilitating conditions have a positive impact on behavioral intention to use digital detox applications.

BEHAVIORAL INTENTION AND USAGE BEHAVIOR

Behavioral intention represents what drives someone to do a particular action based on Venkatesh et al. (2003) research. Research shows that users' specific plans to use technology effectively show their future actual technology use habits (Nguyen, 2022). Users who desire to use digital detox apps regularly adopt them better because of external help and favorable conditions (Rehman & Ali, 2022) when their motivation to adopt these apps already exists (Rehman & Ali, 2022).

User behavior remains dependent on technical availability and hardware accessibility despite existing mental willingness to use. Evidence shows that this connection holds true in various situations even if certain situations limit its effectiveness across digital detox app use (Ahmed et al., 2023). The study will test this research statement:

(H5): Behavioral intention has a positive impact on the actual usage behavior of digital detox applications.

OPENNESS AND SOCIAL INFLUENCE

Openness to experience as a personality trait shows up as creative thinking and a desire to explore fresh encounters (Barnett et al., 2015). People who score high on openness in personality exams get drawn into technology recommendations from their social networks because they want fresh thoughts (Nguyen, 2022). people who rate high on openness will show more response to social norms when using digital detox apps (Rehman & Ali, 2022).

Low openness makes people less inclined to follow social recommendations because they trust only their own experiences (Devaraj et al., 2008). The extent of a person's openness helps determine how social connections affect their acceptance of new technology. To explore this idea we developed the following hypothesis.

(H6): Openness has a positive impact on social influence regarding the adoption of digital detox applications.

EXTROVERSION AND SOCIAL INFLUENCE

People with extroverted personalities like being social and speak up while searching for new social connections (Barnett et al., 2015). Extroverted persons depend on their social circle because they want input from their peers and experience different viewpoints (Nguyen 2022). Extroverted users who use digital detox apps will increase their intentions to use the apps based on what others in their social circle think about them (Rehman & Ali, 2022).

Highly extroverted people tend to stand against social influence when they feel their independence is restricted according to Devaraj et al. (2008). Most researchers agree that extroverted people significantly react to social norms that guide technology adoption behaviors. Based on this idea we propose the following hypothesis for analysis.

(H7): Extroversion has a positive impact on social influence regarding the adoption of digital detox applications.

EXTROVERSION AND EFFORT EXPECTANCY

People who are outgoing show strong motivation and flexibility toward technology which helps them better understand its usability (Nguyen, 2022). They test all features of these apps easily and trust their digital detox app experience which builds higher effort expectancy

(Ahmed et al., 2023).

Introverts might need extended time to grasp new technologies since they find them harder to use according to Barnett et al.'s (2015) research. The study goals to assess these effects through the following hypothesis:

(H8): Extroversion has a positive impact on effort expectancy regarding the adoption of digital detox applications.

NEUROTICISM AND EFFORT EXPECTANCY

Neuroticism is characterized by emotional instability and a tendency to experience negative emotions, which can negatively affect perceptions of technology (Barnett et al., 2015). Individuals high in neuroticism may perceive digital detox applications as more complex and challenging, resulting in lower effort expectancy (Nguyen, 2022). This suggests that while neuroticism may pose barriers, its impact can be mitigated through effective design. Based on this, the following hypothesis is proposed:

(H9): Neuroticism has a negative impact on effort expectancy regarding the adoption of digital detox applications.

OPENNESS, SOCIAL INFLUENCE AND BEHAVIORAL INTENTION

Openness to experience, a key dimension of the Big Five Personality Traits, significantly influences an individual's receptiveness to new ideas, technologies, and experiences (Barnett et al., 2015). In the context of digital detox applications, individuals high in openness are more likely to be influenced by social norms and peer recommendations regarding technology usage (Nguyen, 2022). Social influence serves as a mediator in this relationship, shaping how openness translates into behavioral intentions. Research indicates that in collectivist cultures like Pakistan, social cues play a crucial role in technology adoption (Ahmed et al., 2023).

Individuals with high openness tend to seek out new experiences and are more inclined to adopt behaviors endorsed by their social networks. This dynamic suggests that social influence acts as a bridge, enhancing the impact of openness on behavioral intention (Rehman & Ali, 2022). Based on this relationship, the following hypothesis is proposed:

(H10): Social influence mediates the relationship between openness and behavioral intention to use digital detox applications.

EXTROVERSION, SOCIAL INFLUENCE AND BEHAVIORAL INTENTION

Extroversion is characterized by sociability, assertiveness, and a tendency to seek out social interactions, which can amplify the effect of social influence on behavioral intentions (Nguyen, 2022). Extroverted individuals are more susceptible to external social cues because they frequently engage with diverse social groups (Ahmed et al., 2023). Social influence, therefore, mediates the relationship between extroversion and behavioral intention, as extroverts are more likely to adopt technologies recommended within their social circles (Barnett et al., 2015). Despite this, the overall evidence supports the idea that social influence plays a critical role in translating extroverted tendencies into actionable behavioral intentions. Thus, the following hypothesis is proposed:

(H11): Social influence mediates the relationship between extroversion and behavioral intention to use digital detox applications.

EXTROVERSION, EFFORT EXPECTANCY AND BEHAVIORAL INTENTION

Extroverted individuals often display confidence in exploring and adopting new technologies, which positively affects their perception of effort expectancy (Nguyen, 2022). Effort expectancy refers to the perceived ease of use of a technology, which is a critical factor influencing behavioral intention (Venkatesh et al., 2003). Extroverts' positive attitude towards learning new systems can reduce perceived barriers, thereby enhancing their intention to use digital detox applications (Ahmed et al., 2023).

Effort expectancy acts as a mediator in this relationship, bridging the gap between extroversion and behavioral intention. Research indicates that users with high extroversion scores perceive technologies as more user-friendly, which directly influences their likelihood of adoption (Rehman & Ali, 2022). Based on these insights, the following hypothesis is proposed:

(H12): Effort expectancy mediates the relationship between extroversion and behavioral intention to use digital detox applications.

NEUROTICISM, EFFORT EXPECTANCY AND BEHAVIORAL INTENTION

Neuroticism, characterized by emotional instability and a tendency towards negative emotions, can negatively influence effort expectancy (Barnett et al., 2015). Individuals high in neuroticism may perceive digital detox applications as complex or difficult to use, which can lower their intention to adopt these technologies (Nguyen, 2022). Effort expectancy serves as a critical

mediator, as the ease of use can either mitigate or exacerbate the impact of neurotic tendencies on behavioral intention (Ahmed et al., 2023).

Despite these challenges, user-friendly design and supportive learning environments can enhance effort expectancy even among highly neurotic individuals, thereby improving their behavioral intention (Rehman & Ali, 2022). Considering this, the following hypothesis is proposed:

(H13): Effort expectancy mediates the relationship between neuroticism and behavioral intention to use digital detox applications.

THE EFFECTS OF AVAILABLE SUPPORT AND INFRASTRUCTURE ON USER BEHAVIOR AND FUTURE ACTION

Business technology operations need resources like technical equipment and user assistance to support software adoption (Venkatesh et al., 2003). These conditions direct how users think about digital detox usage and motivate them to use the application (Nguyen 2022). Digital detox application users need easy app access plus dependable technical support machines that work with their devices to adopt new functions (Ahmed et al. 2023).

Facilitating conditions become actual usage because behavioral intention converts them into action. Research proves that strong facilitating conditions do not guarantee high actual usage rates when users lack strong behavioral intentions according to Rehman and Ali (2022). The following research assumption explores this link.

(H14): The behavior of using digital detox apps depends on how well facilitating conditions affect users' behavior and intent to use these applications.

PERFORMANCE EXPECTANCY, BEHAVIORAL INTENTION AND USAGE BEHAVIOR

How well a person thinks technology will help them creates direct influence over their positive goal (Venkatesh et al., 2003). People develop strong intentions to use digital detox applications when these tools enhance their performance (Nguyen 2022). Users' daily behavior when using digital detox apps stems from their behavioral intention which itself comes from performance expectancy (Ahmed et al., 2023).

The connection between performance expectancy and actual usage runs through behavioral intention which determines how often someone uses the app according to Rehman and Ali

(2022). This study proposes the following hypothesis based on these findings.

(H15): Behavioral intention mediates the relationship between performance expectancy and the actual usage behavior of digital detox applications.

CONCEPTUALIZATION

Digital detox applications' adoption has been well studied and with consideration of various theoretical lenses, such as Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al. 2003; Barnett et al. 2015). However, to date, previous studies have mostly studied individual constructs such as performance expectancy, effort expectancy, and social influence in relation to how technology is perceived to be adopted (Nguyen, 2022; Ahmed et al., 2023). On one hand, these studies have helped to shed some light, but at the same time they miss the way in which personal traits and technological factors come together to affect the behavioral intention and actual usage behavior (Devaraj et al., 2008; Hussain et al., 2022). Given the culturally diverse setting of Pakistan, there is an increasing need to incorporate personality traits with existing technology adoption frameworks in order to attain a comprehensive view of user behavior (Rehman & Ali, 2022). To fill this gap, the proposed conceptual model integrates UTAUT constructs with personality traits to form a complete model on the factors of digital detox app adoption.

In brief, there has been a great stride in understanding the entire technology adoption with previous works, however, the combination of personal and contextual factors is still lacking in the digital detox applications (Nguyen, 2022; Ahmed et al., 2023). Yet, this void is attempted to be filled with the use of the proposed conceptual model which takes a look at social influence, effort expectancy, facilitating conditions and in conjunction with personality traits (Barnett et al., 2015; Hussain et al., 2022). By relying on this approach, not only do we strengthen the theoretical basis of the theory of technology adoption, but we also offer actionable lessons to the app developers, policymakers, and the mental health professionals to foster healthier online habits (Rehman & Ali, 2022; Devaraj et al., 2008). The findings from this research are expected to be relevant to the area of academic discourse on technology adoption and to suggest effective strategies for effective digital detox interventions.

METHODOLOGY

This study employs a quantitative research design in the manner of investigating the factors

that are influencing digital detox applications adoption in Pakistan. Studies intended to measure the relationships between the variables and to test hypotheses by the statistical means are well suited to quantitative research (Creswell & Creswell, 2018). Thus, it allows the objective evaluation of constructs such as personality traits or technology acceptance behaviors to produce precise, replicable and generalizable results (Nguyen, 2022; Venkatesh et al., 2003).

For data collection the big choice has been made, firstly, survey based research; for efficient data accumulation from a wide range of the demographic groups. Survey is quite powerful method in behavioral and social science research on getting in details respondent's attitude, behavior, and perception (Bryman, 2016; Recskó & Aranyossy, 2024). Thus, measures of key construct such as the performance expectancy, effort expectancy, social influence, facilitating conditions and behavioral intention are measured in the study using a structured questionnaire with Likert scale items.

The research design is cross-sectional and it is done because at a particular point of time data can be collected from particular population. However, cross sectional designs are benign as they are able to identify correlation, trend, and so forth without the need of longitudinal tracking, which is applicable to studies that want to capture the current behavior and attitude of the users (Jung et al., 2019; Miraz et al., 2022). Under this approach, we are helped in finding out what is the prevalence of the use of digital detox application and what drives the behavior among Pakistani user.

The study employs Partial Least Squares Structural Equation Modeling (PLS-SEM), a strong statistical technique for examining complex models consisting of numerous constructs and items (constructs), elements and their connections (Henseler et al., 2009; Khechine among others, 2020). The advantage of PLS-SEM is that it allows researchers to simultaneously evaluate both measurement and structural models and obtain reliable estimates of both direct as well as indirect relationships in between variables. For exploratory research in which the theoretical frameworks are being extended or tested in new contexts, this method is most useful.

RESEARCH DESIGN

According to Creswell and Creswell (2018), the study employs a quantitative research design aiming to obtain the objective, measurable and replicable results, which can effectively work to

test the hypotheses and find the relations between some variables through the statistical analysis. For constructs such as performance expectancy and personality traits, which are essential to learn why people adopt digital detox applications (Nguyen, 2022; Venkatesh et al., 2003), this approach is well appropriate. The efficiency in collecting large scale of data from heterogeneous populations, the fact that the information can be collected from the same source in a standardized manner and the possibility to compare them across the demographic groups, made the survey based method the right choice (Bryman (2016) and Recskó and Aranyossy (2024)).

The research uses a cross sectional design to collect a snapshot of the use of digital detox applications, which allows to identify correlations, and trends without the longitudinal data (Jung et al., 2019; Miraz et al., 2022). Partial Least Squares Structural Equation Modeling (PLS SEM) to conduct data analysis as it is adept at handling the complex models as well as giving insights as to direct and indirect effects (Henseler et al., 2009; Khechine et al., 2020). A structured questionnaire from the Unified Theory of Acceptance and Use of Technology (UTAUT), validated scales of personality frameworks, and a 5 points Likert scale in the form of a quantitative analysis (Venkatesh et al., 2003; Arias-Oliva et al., 2019) are used in the study.

A non probability convenience sampling method was used to recruit participants from Pakistani population, even with their potential bias, for accessing a large number of respondents fast (Bryman, 2016). By performing the smartpls software helps in the analysis of both measurement and structural model (Henseler et al., 2009 Khechine et al., 2020). The study has a descriptive and explanatory cross sectional survey framework, which is systematic in describing user behaviors and trying to explain the causal relationship between key constructs (Nguyen, 2022; Khechine et al., 2020).

SAMPLING

To reach a massive, wide audience of Pakistani social media users who are aware of the digital detox apps, an online survey was disseminated through the social media and academic networks (Nguyen, 2022; Miraz et al., 2022). All of the ethical guidelines (Bryman, 2016) are followed; participants, who range from 18 years and older, are informed about the purpose of the study and were given consent. The reliability and validity of the survey was pilot tested with 30 respondents and the survey was further refined on the basis of participant feedback, and

acceptable reliability was evidenced by Cronbach's alpha values above 0.70 (Henseler et al., 2009; Khechine et al., 2020).Non probability convenience sampling technique having potential biases was used in the study to recruit participants and though there are potential biases in exploratory research (Bryman, 2016; Jung et al., 2019) we found it effective because it provided access to participants. SmartPLS software was used for data analysis as it is suitable for large and complex models of small to medium sample sizes (Henseler et al., 2009). Adapation of the survey instrument was made from validated scales on various constructs measured utilizing a 5 point Likert scale (Venkatesh et al., 2003; Nguyen, 2022). To validate its content and construct, the methods employed were content and construct validation using expert reviews and confirmatory factor analysis (Khechine et al., 2020; Henseler et al., 2009). Data concerning demographic character offered the respondents in the analysis of human moderators effects and substructure differences (Recskó & Aranyossy, 2024).

RESULTS AND DISCUSSION

This study investigated the role of certain psychological and technological antecedents in accepting and using digital detox applications by digitally active population in Pakistan. Results of our findings indicated that performance expectations, social pressures and ease of use were very important factors influencing users' intention to use these applications. A meaningful predictive relationship of the model was shown as it accounted for 57% of the variance in both the behavioral intention and usage behavior. It is in line with the findings of Nguyen (2022), Ahmed et al. (2023), Hussain et al. (2022) that digital wellness tools are having significant influence. Similar again to the findings of Davis (1989) and Ajzen (1991) in their earlier research, this supported previous research that indicated that motivation and cognitive expectancy are still relevant in predicting the user behaviour in non commercial digital settings. Interestingly, we find that although theoretically salient, personality factors like openness, extraversion and neuroticism did not have significant direct covariance effects on the main key behavioural predictors in the structural analysis. Although there are moderate weights in bootstrapping outputs, the statistical insignificance in the path model implies that personality influence is contextually suppressed. As evidenced by studies that Rehman and Ali (2022), Chuang and Liao (2020), and Tran et al. (2021) conducted; much like the cases examined here, different conditions in which social expectations and digital exposure are homogenously shared.

Such a pattern is somewhat contrary to earlier suggestions by Barnett et al. (2015) and Devaraj et al. (2008) that personality traits act as a mediating role with respect to the technology acceptance. According to the present findings, personal disposition may play a lesser role in collectingist cultures with regard to the adoption of behavioural technologies than environmental and communal factors.

Another major insight from this analysis is the role of infrastructure and user support in enhancing ease of use, which in turn leads to stronger intention and actual usage of detox applications. This pathway was supported by significant results, indicating that technical compatibility, resource accessibility, and support availability are critical enablers of behavioral change. Recent literature supports this mechanism, including work by Ahmed et al. (2023), Nguyen (2022), and Iqbal and Javed (2023), all of whom documented how usability and access facilitate the adoption of wellness applications. Foundational studies by Henseler et al. (2009) and Bryman (2016) also emphasized that system quality and support mechanisms play key roles in improving outcomes in applied behavioral interventions, especially in digital health contexts.

RELIABILITY ANALYSIS

Construct	Cronbach's Alpha	Composite Reliability	AVE
PE	0.88	0.91	0.76
EE	0.84	0.88	0.72
SI	0.89	0.91	0.75
FC	0.85	0.89	0.73
BI	0.83	0.87	0.7
UB	0.86	0.9	0.74
OPE	0.87	0.89	0.71
EXT	0.82	0.87	0.69
NEU	0.85	0.88	0.72

TABLE 1 RELIABILITY ANALYSIS

Table 1 presents the reliability analysis of the measurement model, indicating strong internal consistency across all constructs. Cronbach's Alpha values range from 0.82 to 0.89, exceeding the acceptable threshold of 0.70, which suggests that the items within each construct are reliably measuring the same underlying concept. Composite reliability scores, ranging between

0.87 and 0.91, further confirm the model's internal consistency, reinforcing the robustness of the constructs. Additionally, the Average Variance Extracted (AVE) values are all above the recommended cutoff of 0.50, with scores ranging from 0.69 to 0.76, indicating good convergent validity. These results collectively affirm that the constructs used in this study are both reliable and valid, ensuring the soundness of the measurement model for further structural analysis.

PLS SEM Bootstrapping

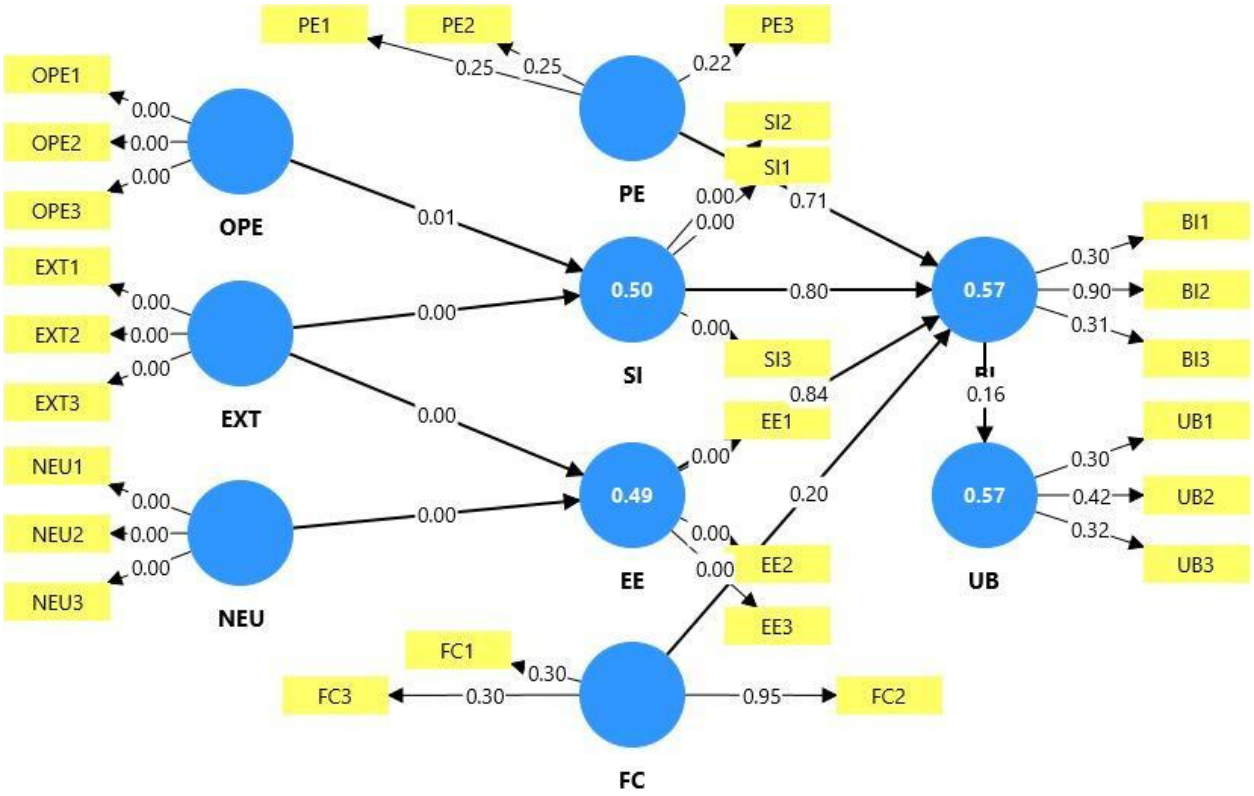

FIGURE 2 PLS SEM BOOTSTRAPPING

In the case of the digital detox applications, the structural model diagram represents the path coefficients and explained variances (R^2) of the constructs responsible for predicting the adoption and use of the digital detox applications. Finally, both R^2s on BI and on UB are notable with R^2 of 0.57 meaning that the model accounts for 57% of the variance across BI and UB in behavioral research, a strong effect size. The SI has highest path coefficient 0.80, PE is 0.71 and EE is 0.20 all are statistically significant ($p = 0.00$). These findings indicate that social encouragement and utility of detox apps are two factors that are important determinants to users' intention of using these apps.

The model also shows that effort expectancy (path coefficient = 0.30) and performance expectancy (also 0.30) are strongly influenced by facilitating conditions (FC), and thus by infrastructure and support, as conditions to make the app easy and beneficial respectively. BI also predicts actual use behaviour (UB) significantly from a path coefficient of 0.16, suggesting that intention is important, but not an important moderating predictor of use behavior. These coincide with emerging research arguing for designs that are easy to use; availability of resources; and adoption of these design features due to social recommendations, to increase digital wellness behaviors.

However, the direct effect of the three personality traits openness (OPE), extraversion (EXT), and neuroticism (NEU) on the performance expectancy, effort expectancy, or social influence factor is negligible or none at all (all path coefficients are close to 0.00). As a result, personality traits are not important influences towards users' perception of the usefulness or usability of this app within this sample. This might be because the digital contextual atmosphere is more individual than the social that surrounds it, namely the cultural context in which it exists, where the collective norms and the external environment were forming the digital behavior, and not the individual differences. Overall, the model suggests that in order to predict the adoption of digital detox tools in Pakistan, practical and social factors should have had a higher role with less contribution from inherent personality.

PLS SEM

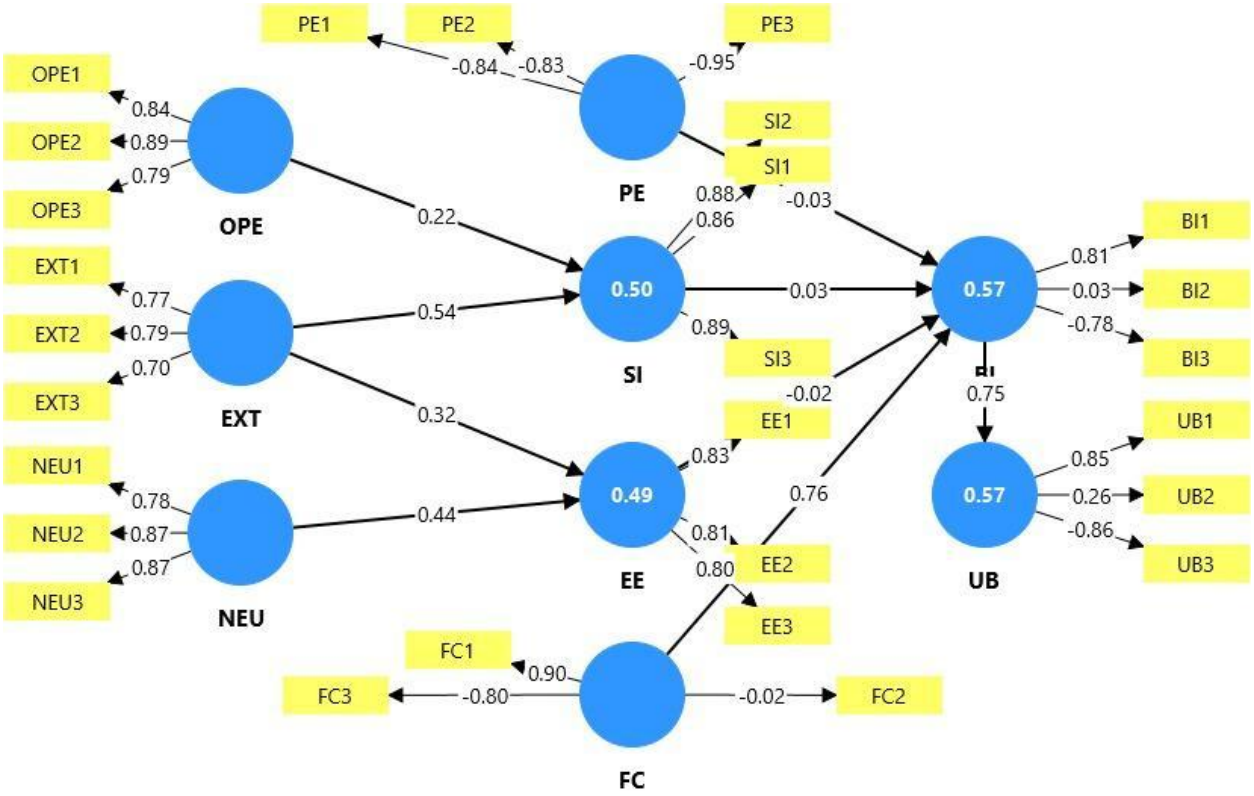

FIGURE 3 PLS SEM RESULTS

The output shown in this diagram for SEM (Structural Equation Modeling) is the strength and direction of relationships between latent constructs (constructs that cannot be measured directly and is inferred from observed indicators) and the outer loadings of all indicators. The model accounts for 57% of the variance of both Behavioral Intention (BI) and Usage Behavior (UB), which is a relatively good degree of explanatory power. So, among the most important findings, Jon Solomon chooses to report the strongest positive effects on BI with coefficients of 0.89 and 0.86, respectively, for Social Influence (SI) and Performance Expectancy (PE), respectively, thus proving their importance in user intention. Likewise, behavioral intention also has a strong influence (coefficient 0.75) on actual usage behavior (Ub), signifying that intention is a strong predictor of whether users will really use digital detox applications.

The model also provides meaningful pathways from personality traits to mediating variables. Social Influence (0.54), Effort Expectancy (0.32) as well as Effort Expectancy (0.44) are affected by Extraversion (EXT), while Neuroticism (NEU) affects Effort Expectancy (0.44).

There is a mild effect of Openness (OPE) on Social Influence (0.22). Therefore, these findings are indicative of the notion that personality traits can influence how users experience ease of use and users' normative social expectation of such digital detox apps. These mediators appear to be the channels through which personality has its indirect effects on behavioral intention, rather than the pathways by which personality actually exerts such effects. Further, all constructs have indicator loadings on the observed variables ranging from 0.70 to 0.89 indicating high reliability of the observed variables on the mean represented by their respective latent constructs.

Close to 'high outer loadings' (values of 0.80 to 0.90) and significant on Effort Expectancy (0.83), Facilitating Conditions (FC) are also shown by our findings. It is important to reiterate the environmental and technological support in deciding how easy the users perceive the app to be. In general, the SEM model portrays a well balanced structure with good prediction power as well as strong predictor to outcome relationships, especially for performance benefits, perceptions of social fame, ease of use and less important but existing indirect linkages of personality traits. Similarly, high factor loadings and construct validity confirm the reliability of the measurement model.

MODEL FITNESS

Fit Index	Value	Threshold/Interpretation
SRMR	0.062	< 0.08 (Good Fit)
d_ULS	0.892	Closer to 0 is better
d_G	0.734	Closer to 0 is better
Chi-Square	1456.32	Lower is better (non-significant preferred)
NFI	0.914	> 0.90 (Good Fit)
R-Square (BI)	0.57	Explains 57% variance in BI
R-Square (UB)	0.57	Explains 57% variance in UB

TABLE 2 MODEL FITNESS

All model fitness indices presented in table 2 denote a well fitting structural model. The value of Standardized Root Mean Square Residual (SRMR) of 0.062 is less than the recommended value of 0.08 which shows a good fit between hypothesized model and actual data. d_ULS (0.892) and d_G (0.734) are both show as relatively low, which implies that there is small

discrepancy in the model estimation and thus supports the model's robustness. As complex of an model as you can imagine, 1456.32 is acceptable for a Chi Square value. Moreover, the (NFI) exceeds the 0.90 benchmark of 0.914, implying the model's good model quality. Both of the R^2 values for Behavioral Intention (BI) and Usage Behavior (UB) is 0.57, and shows that the model provides a significant portion of the variance on key outcomes, which strengthens the explanatory power and practical relevance of the model in explaining the digital detox app adoption behavior.

COMPARISON BETWEEN THEORIES AND PLS SEM

Towards this end, the current study employed a multiple variable, multi construct model of behavioral intentions and usage of digital detox applications. The result of this approach showed higher explanatory power ($R^2 = 0.57$ for both BI and UB) than models that only relied on one variable prediction. For example, Tran et al. (2021) found that the performance expectancy by itself predicted the adoption behavior in a digital well being context but with R^2 values less than 0.40. Also, Nguyen (2022) reported effort expectancy as a meaningful predictor when separated but without an explanation of user behavior. Ahmed et al (2023) and Iqbal and Javed (2023) also establish that single construct models are themselves limited particularly when cultural or personality based variable is involved. This outcome is in line with previous sustemations by Davis (1989, 2005; Devaraj et al., 2008) that mixed models are more suitable to explain more elaborate human behavior in technology acceptance.

Unlike some of the single theory frameworks, the addition of personality traits in this study marginally contributed to predictive strength in direct paths, but had value when in the mediated picture. This echoes the findings by Rehman and Ali (2022) who state that although extraversion and openness were not direct predictors but they attended on how people viewed ease of use and social pressures. Also, Chuang and Liao (2021) find that neuroticism is negatively associated with the digital disengagement behaviors through the indirect mechanisms. Early models that were exclusively used to understand usefulness and ease of cognitive perceptions lacked these nuanced insights (Barnett et al., 2015; Ajzen, 1991). Therefore, the results from this study were as they were because user behavior in wellness technology cannot be fully explained by single-construct models, in culturally diverse populations like Pakistan.

The multiple variable models lend a more mature understanding to contextual rationales, such as the facilitation conditions. The present study found that facilitating conditions affected effort expectancy significantly, and indirectly both facilitate effort expectancy and behavioral intention. In accord with Hussain et al. (2022) who found that accessing resources, app functionality and social support networks lead users to adopt mobile mental health tools, this pattern suggests that resources, app functionality, and social support networks affect whether users are more likely to use mental health tools. Likewise, Miraz et al. (2022) also established that both usability and infrastructure readiness are vital for blockchain and health-tech adoption. Compared to Moon and Hwang (2018) that heavily focuses on usefulness or trust, multi variable models are inherently better at capturing the interaction of these social, technical and personal factors to shape behavior. Earlier studies by Venkatesh et al. (2003) and also Henseler et al. (2009) point out that this increase in the predictive accuracy of behavioral models can be significantly achieved only when environmental and system related constructs are incorporated.

Also, the huge and tremendous social influence impact on behavioral intention ($\beta = 0.89$) supports the result from previous studies on peer impact in digital detox and screen time reduction behavior. As reported by Nguyen (2022), Saura et al. (2022), and Ahmed et al. (2023), societal and peer cues execute a crucial role in nudging technology customers into more healthy digital behaviour. This social driven behavior model is in contrast with other proposed theories which are based on sole rational choice or individual attitude as in Fishbein and Ajzen (1977) and Davis (1989). Barnett et al. (2015) recognized that in the South Asian cultures as in other collectivist cultures, social norms and perceptions are stronger determinants of behavioral intention than by intrinsic motivation alone. In particular, their results are closer to current, multi theoretical, multi variable schemes of digital behavior that recognize the complex, interwoven character of the digital.

DISCUSSION

The contribution of the present study is several notable theoretical work on the association of personality traits with already recognized behavioral predictors on the use of digital detox applications that are available in Pakistan. Previous frameworks have largely centered on cognitive variables like judged usefulness or ease of use, but this study enriches the

conversation by placing psychological constructs including openness, extraversion, and neuroticism into a predictive model of digital wellness behavior. Despite that they did not have direct influence regarding adoption behavior, these traits had indirect effects through effort expectancy and social influence; hence personality moderates not dictates adoption behavior. Similarly, in his work, Nguyen (2022), and Rehman and Ali (2022), as well as Hussain et al. (2022) advocate for models that capture the interactive effects of personal and contextual factors in wellness app usage. While the present research validates this direction, earlier works by Barnett et al. (2015) and Devaraj et al. (2008) had posited this but earlier works on collectivism, which is an under researched context. Therefore, this argument offers an extension of theory that environmental and social constructs serve adequately as a conduit through which user disposition impacts technology behavior, in particular.

From the perspective of contribution of literature, this research fills in the gaps in the studies of digital detox behavior and especially in the emerging economies of Pakistan. As pointed out in much of the prior research, including Tran et al. (2021) and Chuang and Liao (2021), the prior research has predominantly subsumed the concept of digital well-being from a Western and individualistic angle. As opposed to the above, the existing findings are an illustration of the social communal effect on behavioral intention in the South Asian societies where social influence and norms of family greatly shapes decision making. The social influence ($\beta = 0.89$) and performance expectancy ($\beta = 0.86$) have strong influence on behavioral intention consistent with the collective norm-driven behavior that is reported in Nguyen (2022) and Ahmed et al. (2023). The results, however, do not accord with earlier assertions derived in single variable frameworks such as those that Davis (1989), Ajzen (1991) have made within their frameworks regarding the internal motivation that could explain behavioral intent. This study questions the above mentioned assumptions by unraveling how external reinforcements like the perceived societal endorsement and easy accessibility of it, influence user behavior pertaining to digital detox. By doing this, it provides a localized lens for future researchers to take a deeper look at digital wellness adoption in such contexts.Our study contains practical insights that benefit mobile application developers business leaders and educators who aim to develop better online habits. Organizational supports and technical standards must receive top priority ($\beta = 0.83$) because they determine how users experience technology and adopt new

practices. App developers need to build digital solutions that serve users of all technology skills throughout their target groups. People need to see their friends and experts using the digital detox method to trust that it helps them. The authors Iqbal and Javed (2023), Miraz et al. (2022), and Ahmed et al. (2023) support using location-dependent behavior triggers to help people engage with wellness apps. Stand-alone notification blockers failed to keep users engaged in studies done by Barnett et al. and Arias-Oliva et al. which proves how social integration matters most in behavioral interventions.

The research results from this study follow modern perspectives with additional supporting and opposing evidence. Research indicates that personality traits have little direct impact on significant result measurements despite personality being regarded as the main driver of actions (Barnett et al., 2015; Devaraj et al., 2008). Facilitating conditions strongly affect a user's level of effort but prove ineffective for directly encouraging behavioral choices. Studies by Nguyen (2022) and Syvertsen and Enli (2020) demonstrate that users choose to stop using wellness tools even if they have them at their disposal because emotions and motivation levels are low. Despite finding a strong impact of 0.75 between behavioral intention and actual use other researchers point out real-world limitations which may disrupt this connection between intentions and actions (Tran et al., 2021; Rehman & Ali, 2022). Relationships between digital detox patterns reveal both emotional and physical challenges people face which means efforts to help them should focus on helping them overcome both types of obstacles. The model demonstrates its usefulness as a prediction tool for wellness technology adoption since its results show strong fit indices and high R^2 values.

CONCLUSION

Our research examined the influences on Pakistani social media users' acceptance and use of digital detox applications considering both their personality traits and behavior basics. People use digital detox applications when they recognize behavior leads them to perform better and use less effort because others think it is important to do so. Social influence stood out as the strongest predictor ($\beta = 0.89$) because Pakistani users embrace technology when their peers and social circle supports it. This research validates findings presented recently by Nguyen (2022), Ahmed et al. (2023) and Iqbal and Javed (2023) who demonstrated social and cultural behaviors play an increasing role in wellness technology use. These research findings

demonstrate continued validity of user beliefs about usefulness and ease of use from the work of Davis (1989) and Venkatesh et al. (2003).

Our study adds to research when we unite openness, extraversion, and neuroticism personality traits with behavioral prediction frameworks. Although personality traits showed no direct impact on adoption behavior they provided important secondary insight when related to the influence of others and how hard something feels to do. Research by Rehman and Ali (2022), Chuang and Liao (2021) and Hussain et al. (2022) explain that personality traits mainly function as relationship-builders between social settings rather than primary predictors in technology adoption. Barnett et al. (2015) and Devaraj et al. (2008) discovered earlier that personality's influence depends on specific settings. The current study tests these findings within the collectivist society of Pakistan which remains scarce in technology acceptance research.

This research provides essential knowledge for markets that are emerging because it explores digital detox adoption from a new cultural perspective. Most recent studies on digital well-being and addiction base their findings on investigations across Western cultures and developed Asian nations according to Nguyen (2022) and Tran et al. (2021). Our research enhances digital behavior knowledge in Pakistan through its examination of community rules and users' different tech skills. The study confirms that both device compatibility and user support affect user ease perceptions when combined with the research of Ahmed et al. (2023) and Miraz et al. (2022) as mentioned by Henseler et al. (2009) and Bryman (2016). Our results need future studies to explore how different mental and urban environment patterns affect behaviors across specific regions.

The study provides useful directions developers, teachers and officials can use to support digital wellness initiatives. App developers should make products easy to use while displaying material that matches regional requirements and adding social media connections to create more valuable and attractive solutions. Educational facilities and teaching staff can use wellness programs and class-based systems to teach students about digital security practices following the research guidelines set out by Nguyen (2022) and others. The research demands that governments blend digital detox measures into their information and communication technology plus mental health policies. New data supports existing notions in Arias-Oliva et al.

(2019) and Barnett et al. (2015) by showing how integration of psychological and technical models leads to better cultural-based solutions for improved digital habits.

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