behavioral sciences

MDPI

Article

Digital Leisure Orientation, Flow Experience, and Satisfaction with Digital Leisure Among Earthquake-Affected Adults in Hatay, Türkiye

Mehmet Inan [1], Rifat Yagmur [2], Cihan Ayhan [3,*], Yunus Şahinler [4], Laurentiu-Gabriel Talaghir [5,*], Anamaria Berdila [5], Liliana Nanu [5] and Mariana Constantinescu [6]

[1] Faculty of Sport Sciences, Yozgat Bozok University, Yozgat 66100, Türkiye; mehmet.inan@bozok.edu.tr
[2] Faculty of Sport Sciences, Afyon Kocatepe University, Afyonkarahisar 03200, Türkiye; ryagmur@aku.edu.tr
[3] Faculty of Sport Sciences, Sakarya University of Applied Sciences, Sakarya 54050, Türkiye
[4] Faculty of Sport Sciences, Istanbul Gelişim University, İstanbul 34310, Türkiye; ysahinler@gelisim.edu.tr
[5] Faculty of Physical Education and Sport, Dunarea de Jos University of Galati, 800003 Galati, Romania; anamaria.berdila@ugal.ro (A.B.); lnanu@ugal.ro (L.N.)
[6] Faculty of Education Sciences, Dunarea de Jos University of Galati, 800008 Galati, Romania; mariana.constantinescu@ugal.ro
* Correspondence: cihanayhan@subu.edu.tr (C.A.); gabriel.talaghir@ugal.ro (L.-G.T.); Tel.: +90-5333076836 (C.A.)

Abstract

Background: This study examined the associations among digital leisure orientation, flow experienced during digital leisure, and satisfaction with digital leisure, including the statistical indirect association through flow, among adults who experienced the 2023 Kahramanmaraş earthquakes. Methods: A cross-sectional survey was conducted in Hatay, Türkiye, about three years after the 6 February 2023 earthquakes (n = 402 adults aged 18–65 years). Digital leisure orientation, flow, and satisfaction with digital leisure were measured with self-report scales. Indirect effects were estimated with PROCESS Model 4 and with latent variable models including an unmeasured latent method construct (ULMC). Results: Digital leisure orientation was associated with flow (β = 0.733), and flow with satisfaction (β = 0.796). The indirect effect was significant in the observed-variable analyses (standardized = 0.583, 95% CI [0.520, 0.647]), also after adjustment for age and sex. Flow and satisfaction overlapped strongly (HTMT = 0.917). When the ULMC was modeled, the indirect effect was no longer significant. Conclusions: Among earthquake-affected adults, digital leisure orientation was positively associated with flow and with satisfaction in digital leisure. Given the strong measurement overlap between flow and satisfaction (HTMT = 0.917) and the sensitivity of the indirect effect to common method variance, the observed statistical indirect effect may largely reflect a shared, general positive evaluation of digital leisure rather than an independent psychological mechanism.

Keywords: digital leisure; flow experience; leisure satisfaction; earthquake-affected population; mediation analysis

Check for updates

Academic Editor: Alex J. Holte

Received: 30 September 2026
Revised: 20 October 2026
Accepted: 24 October 2026
Published: 28 October 2026

Copyright: © 2026 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

1. Introduction

Large-scale disasters such as earthquakes affect not only individuals' physical living conditions but also their psychological adaptation processes, social relationships, and daily life routines (Del Missier et al., 2026; Erkuş Demir & Akgün, 2026; Özmaya et al., 2026; Toktaş & Servi, 2026). Traumatic experiences of this nature may produce long-term effects on

subjective well-being, life satisfaction, and social connectedness. In particular, uncertainty, loss, and disruptions in perceptions of safety have been reported to complicate psychosocial adaptation processes (Prime et al., 2020; Wang et al., 2020). During the post-disaster period, individuals often turn to leisure activities as a means of coping with adverse psychological conditions, and leisure may therefore function as a mechanism for emotional regulation and psychological recovery (Genç & Yılmaz, 2024). With the increasing integration of digitalization into everyday life, this tendency has become progressively concentrated within digital leisure activities. Through digital platforms, individuals seek not only escape and relaxation but also social interaction and a sense of belonging (Ferris et al., 2021). From this perspective, Uses and Gratifications Theory suggests that individuals actively use digital media and online platforms to satisfy psychological and social needs (Katz et al., 1973), whereas Self-Determination Theory emphasizes that fulfilling basic psychological needs such as autonomy, competence, and relatedness strengthens intrinsic motivation and well-being (Deci & Ryan, 2000). In addition, Flow Theory proposes that deep concentration, altered time perception, and intrinsic enjoyment emerging from intense engagement in an activity enhance the level of experienced satisfaction (Csikszentmihalyi, 1990). Based on this theoretical framework, digital leisure orientation may be positively associated with the satisfaction individuals derive from digital leisure in an earthquake-affected region, and flow experienced during digital leisure may statistically account for part of this association. However, given the correlational and cross-sectional nature of the present study, these relationships are examined as statistical associations rather than causal relationships. Leisure activities represent one of the key mechanisms supporting individuals' psychological resilience, motivation, and well-being during post-disaster adaptation processes (Duman et al., 2025; O. Yılmaz & Çetinkaya, 2024; O. Yılmaz & Dertli, 2025). The leisure coping approach explains that leisure activities are used not merely as ways of spending free time but also as sources of emotional regulation and coping in the face of stressful life events and psychological strain (Ertaş et al., 2026; Iwasaki, 2003). This perspective highlights leisure as an active resource that strengthens psychological resilience (S. Yılmaz et al., 2025) and identifies it as a significant protective factor, particularly during recovery from traumatic experiences. Recent meta-analytic findings have demonstrated that participation in leisure activities has significant positive effects on subjective well-being, life satisfaction, and psychological health (Chen et al., 2022; Freire et al., 2026; Kuykendall et al., 2015). Furthermore, comprehensive reviews examining the relationship between leisure, stress coping, and psychological well-being indicate that these effects largely occur through emotional regulation processes (Newman et al., 2014). Studies focusing on pandemics and crisis periods similarly suggest that leisure functions as a psychological buffer and plays a critical role in maintaining well-being (Shen et al., 2022; Yu & Kim, 2021). At the same time, accelerated digitalization has structurally transformed leisure experiences, increasing individuals' orientation toward digital leisure activities instead of traditional recreational forms. Research on the psychological effects of digital media use has shown that online interactions may support well-being by providing social connection, escape, and emotional relief (Valkenburg et al., 2022). Accordingly, digital leisure orientation may be considered a relevant behavioral and motivational construct for understanding leisure experiences among people living in post-disaster settings, although the present study does not assess psychological adaptation or recovery directly.

Digital leisure orientation refers to individuals' tendency to spend their leisure time in digital environments and encompasses online gaming, social media interactions, video streaming platforms, and other forms of digital content consumption (Luo & Hancock, 2020). Uses and Gratifications Theory posits that individuals actively select and use media content to satisfy specific psychological and social needs rather than consuming media passively

(Ruggiero, 2000). In this context, digital leisure activities serve important functions in meeting motivations such as escape, entertainment, information seeking, and social connection. Contemporary studies on digital media use indicate that individuals' orientation toward online environments is associated not only with entertainment but also with emotional regulation and the maintenance of psychological well-being (Beyens et al., 2024; Vorderer et al., 2017). Similarly, Self-Determination Theory emphasizes that satisfying basic psychological needs such as autonomy, competence, and relatedness enhances intrinsic motivation and psychological well-being (Ryan & Deci, 2024). Within this framework, digital leisure activities may strengthen individuals' sense of autonomy by increasing feelings of control while simultaneously supporting relatedness through social interaction. Moreover, the immediate feedback, interaction opportunities, and diversity of content offered by digital environments may encourage individuals to participate more intensively and for longer durations in these settings (Ryan & Rigby, 2020; Reinecke & Hofmann, 2016). Recent studies further suggest that digital media use has complex yet important effects on psychological well-being, and that these effects vary according to motivation and contextual factors (Orben & Przybylski, 2019; Hancock et al., 2022). The ability of digital leisure activities to provide psychological relief, social interaction, and relatively autonomous experiential spaces may contribute to the perceived quality of leisure experiences. In particular, digital recreational activities voluntarily chosen by individuals may be associated with positive emotions and experiential enjoyment, which in turn may influence leisure satisfaction. In addition, the accessibility and sense of control offered by digital environments may support the level of satisfaction individuals derive from their leisure experiences. Accordingly, digital leisure orientation may be positively associated with leisure satisfaction and the perceived quality of recreational experiences.

Flow experience is defined as an optimal psychological state in which individuals become fully immersed in an activity, experience intense concentration, and perceive alterations in their sense of time (Csikszentmihalyi, 1990). According to Flow Theory, this experience emerges when a balance exists between individuals' skill levels and the challenges presented by an activity, producing positive psychological outcomes such as intrinsic enjoyment, perceived control, and deep engagement. The interactive structure, immediate feedback, and continuous participation opportunities provided by digital environments may be relevant to the experience of flow in digital contexts (Hamari et al., 2016). In the present study, flow was therefore assessed with reference to the digital leisure activities in which participants engaged. Recent studies have shown that online gaming, social media use, and digital entertainment activities support flow experience by increasing concentration, cognitive immersion, and intrinsic motivation (Kaur et al., 2016). Recreational flow experience has also been associated with pleasure, satisfaction, and psychological fulfillment derived from leisure activities (Bayram et al., 2025). People living in post-disaster settings may seek to distance themselves from negative emotions and regain a sense of control; in such settings, flow experienced during digital leisure may be closely linked to the satisfaction derived from these activities. Accordingly, recreational flow experience may statistically mediate the relationship between digital leisure orientation and leisure satisfaction. However, because the present study uses cross-sectional data, this mediation should be interpreted as statistical rather than as evidence of a temporal or causal mechanism.

However, participation in digital leisure after a disaster does not depend only on individual preference. According to van Dijk (2020), access to digital media consists of four successive stages: motivation, physical access, digital skills, and usage, and inequalities may occur at each of these stages. Madianou (2015) also showed that unequal access to digital media after a disaster can deepen existing social inequalities. In Hatay, physical access may have been limited by the loss of devices, the cost of mobile data, and weak internet

connections in temporary shelters and container cities. Therefore, a low level of digital leisure orientation may result from structural exclusion rather than from a lack of interest. For this reason, the findings of the present study relate to residents who were able to report on their digital leisure activities and cannot be generalized to residents who were excluded from digital environments.

The literature on leisure, digital media use, and flow experience has developed substantially across different research streams in recent years. Existing studies indicate that leisure activities serve a protective role in enhancing psychological resilience, emotional regulation capacity, and quality of life, particularly following stressful life events (Trenberth & Dewe, 2002). Research on digital media use further demonstrates that individuals' engagement with online environments extends beyond entertainment motives and is associated with multidimensional needs such as social connectedness, psychological relief, perceived control, and emotional regulation (Vorderer et al., 2017; Valkenburg et al., 2022). In parallel, the flow experience literature emphasizes that individuals may achieve optimal experiences in digital and interactive environments through deep cognitive engagement, intrinsic motivation, and focused attention, and that such experiences exert substantial effects on behavioral outcomes and user satisfaction (Hamari et al., 2016). Nevertheless, empirical evidence explaining the psychological mechanisms through which digital leisure orientation is associated with leisure satisfaction among people living in disaster-affected regions remains limited. In particular, the role of recreational flow experience in the relationship between digital leisure orientation and leisure satisfaction has not yet been sufficiently clarified. This gap highlights the need for integrative models capable of examining the statistical relationships between digital leisure behaviors and leisure-related outcomes among populations exposed to major disasters. Therefore, the present study examines whether flow experienced during digital leisure statistically mediates the association between digital leisure orientation and satisfaction with digital leisure among adults who experienced the 6 February 2023 earthquakes and were living in Hatay approximately three years later. The earthquake is treated as the context of the sample rather than as a process examined by the model. Based on this framework, the following hypotheses were proposed:

H_1. *Among earthquake-affected adults, digital leisure orientation is positively associated with leisure satisfaction.*

H_2. *Among earthquake-affected adults, digital leisure orientation is positively associated with recreational flow experience.*

H_3. *Among earthquake-affected adults, recreational flow experience is positively associated with leisure satisfaction.*

H_4. *Among earthquake-affected adults, recreational flow experience statistically mediates the association between digital leisure orientation and leisure satisfaction.*

2. Materials and Methods

2.1. Research Design

This study examined the association between individuals' digital leisure orientation and leisure satisfaction among adults living in an earthquake-affected region. In addition, the statistical mediating role of recreational flow experience in this relationship was evaluated. To this end, a correlational survey design, a quantitative research method used to determine the direction and magnitude of relationships between two or more variables, was employed (Christensen et al., 2015). Correlational research models enable the examination

of interactions among individuals' characteristics as well as the structural relationships between variables. Particularly in social science research, investigating not only direct effects but also indirect and explanatory mechanisms among variables is considered important for expanding existing knowledge and contributing original insights to the literature. In this regard, mediation analyses are regarded as important statistical approaches that contribute to a more comprehensive understanding of social reality (Gürbüz, 2021). Within the theoretical model tested in the present study, digital leisure orientation was treated as the independent variable, recreational flow experience as the mediator variable, and leisure satisfaction as the dependent variable. The theoretical model of the study is presented in Figure 1.

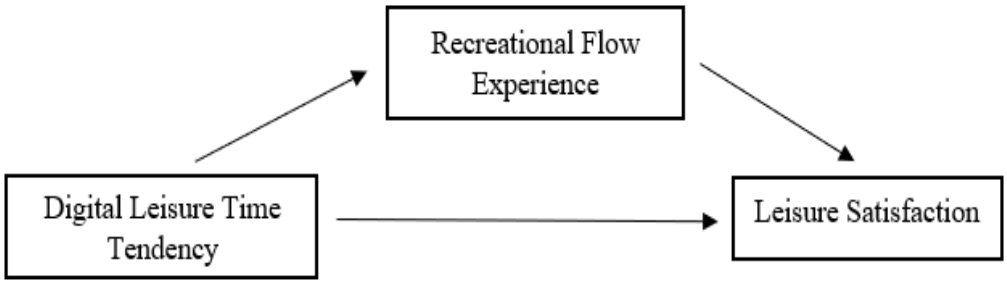

Figure 1. Research Model.

2.2. Participants

The study group consisted of individuals residing in Hatay Province who had directly experienced the 6 February 2023 Kahramanmaraş-centered earthquakes and had been present in Hatay Province at the time of the earthquakes. Purposive sampling, one of the non-probability sampling methods, was employed in the study. Purposive sampling refers to a sampling approach based on the deliberate selection of individuals possessing specific characteristics relevant to the purpose of the research (Patton, 2014). This sampling method is widely used in social science research focusing on traumatic experiences, post-disaster adaptation processes, and individuals with particular lived experiences (Creswell, 2014). Participants were recruited through face-to-face contact by researchers in Hatay Province. Potential participants were approached directly and were provided with information about the purpose and scope of the study, voluntary participation, confidentiality, and the data collection procedure. Eligibility was determined based on the predefined inclusion criteria: participants were required to have directly experienced the 6 February 2023 earthquakes, to have been present in Hatay Province at the time of the earthquakes, and to be residing in Hatay Province at the time of data collection. Individuals who met these criteria and voluntarily agreed to participate were included in the study. Accordingly, the present study aimed to recruit individuals who had directly experienced the earthquake, were residing in Hatay Province at the time of data collection, and had been present in Hatay Province when the earthquakes occurred. Given the study context, the post-earthquake context was operationally defined in terms of individuals who had been physically present in Hatay during the 6 February 2023 earthquakes, had directly experienced the disaster, and continued to reside in Hatay at the time of data collection. This operational definition was used to identify the study population; however, it does not imply that participants experienced the same degree of disaster exposure, loss, displacement, or psychological adaptation. An a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2009) for a linear multiple regression model (fixed model, R^2 deviation from zero). Assuming an effect size of $f^2 = 0.10$ (between Cohen's (1988) small and medium benchmarks), $\alpha = 0.05$, power $(1 - \beta) = 0.95$, and four predictors (digital leisure orientation, flow experience, age, and sex), the minimum required sample size was 191. A total of 425 individuals completed the questionnaire, and the dataset contained no missing values. Participants younger than

18 years (n = 20; 19 women aged 14–17 years and one man aged 12 years) were excluded from the analyses because the Digital Leisure Time Tendency Scale was developed and validated with adults (Turhan & Tutar, 2023). Participants older than 65 years (n = 3; one woman aged 75 years and two men aged 66 and 80 years) were also excluded, because 65 years is a commonly used threshold for older adulthood and three participants could not represent this age group, whose access to and use of digital technologies may differ substantially from those of younger adults. Including these three participants did not change the results (n = 405: standardized indirect effect = 0.589, 95% CI [0.524, 0.653]). The final analytic sample therefore comprised 402 adults aged 18–65 years (M_{age} = 35.05, SD = 12.26), including 186 women (M_{age} = 33.75, SD = 12.08) and 216 men (M_{age} = 36.17, SD = 12.33). All participants were residing in Hatay Province at the time of data collection and had been present in Hatay Province when the 6 February 2023 earthquakes occurred.

2.3. Data Collection

To evaluate the ethical appropriateness of the study, approval was first obtained from the Ethics Committee of Sakarya University of Applied Sciences (Decision No: E-26428519-050.99-220011, dated 9 April 2026). The research process was conducted in accordance with the principles of the Declaration of Helsinki governing scientific research involving human participants. Participants were informed in detail about the purpose and scope of the study, voluntary participation procedures, and data confidentiality, and only individuals who voluntarily agreed to participate were included in the research.

Data were collected between 18 May and 30 July 2026, approximately three years after the earthquakes. Data were collected through face-to-face administration by the researchers from individuals who were residing in Hatay Province at the time of data collection, had been present in Hatay Province when the 6 February 2023 earthquakes occurred, and voluntarily participated in the study. Prior to data collection, written informed consent was obtained from all participants, and they were informed that the collected data would be used solely for scientific purposes. Participant confidentiality was protected throughout the study, and the principle of anonymity was strictly maintained.

2.3.1. Data Collection Tools

Digital Leisure Time Tendency Scale (DLTTS)

The "Digital Leisure Time Tendency Scale," developed by Turhan and Tutar (2023), was used to determine participants' digital leisure orientations. The scale was designed to assess individuals' leisure tendencies in digital environments and consists of 18 items across four subdimensions. These subdimensions are Communication (6 items), Social Interaction (5 items), Psychological Orientation (4 items), and Application Use (3 items). The scale is rated on a 5-point Likert-type format (1 = strongly disagree, 5 = strongly agree). No reverse-coded items are included, and evaluation is based on the total score. Higher scores indicate higher levels of digital leisure orientation.

As part of the scale validation process, exploratory factor analysis confirmed the four-factor structure, which explained 56.52% of the total variance. The Kaiser–Meyer–Olkin value calculated to determine sampling adequacy was 0.866. Reliability analyses revealed Cronbach's alpha coefficients of 0.79 for the Communication subdimension, 0.78 for Social Interaction, 0.80 for Psychological Orientation, and 0.65 for Application Use. The overall internal consistency coefficient of the scale was reported as 0.83, indicating that the instrument is a valid and reliable measure for assessing digital leisure orientation among individuals aged 18 years and older (Turhan & Tutar, 2023). In the present study, Cronbach's alpha was 0.939 for the total scale and ranged from 0.687 to 0.936 for the subdimensions.

Recreational Flow Experience Scale (RFES)

The "Recreational Flow Experience Scale (RFES)," developed by Ayhan et al. (2020), was used to determine individuals' levels of recreational flow experience. The scale was developed to measure the flow experience individuals encounter during recreational activities and consists of a single-factor structure with 9 items. In the present study, the item stem was worded with reference to digital leisure ("The digital leisure activity I participate in..."), so that participants rated the flow they experienced during their digital leisure activities (e.g., "...I give it my full attention", "...I do not notice how time passes"). All items, stems, and response formats of the three scales are provided in Supplementary File S1. The instrument is rated on a 7-point Likert-type scale, and evaluation is based on the total score. The scale does not include any reverse-coded items. Higher scores obtained from the scale indicate higher levels of recreational flow experience.

During the scale development process, the initial item pool was evaluated based on expert opinions, and items deemed inconsistent with the structure of the scale were removed. Exploratory factor analysis yielded a single-factor structure consisting of 9 items, explaining 53.986% of the total variance. Subsequently, confirmatory factor analysis demonstrated that the model showed good fit with the data. Reliability analyses revealed a Cronbach's alpha internal consistency coefficient of 0.892, indicating that the Recreational Flow Experience Scale is a valid and reliable measurement instrument. Because the item stem was adapted to digital leisure, the factor structure of the adapted form was examined with CFA (Table 1). This CFA was conducted post hoc in the same sample (n = 402) that was used to test the hypotheses, because no independent validation sample was available; the construct validity and measurement invariance of the adapted form have therefore not been established independently (see Section 4.2). In the present study, Cronbach's alpha was 0.957.

Table 1. Goodness-of-Fit Indices and Threshold Values, Normality (Skewness–Kurtosis), Reliability (Cronbach's Alpha), AVE, and CR Values of the Scales used in the Study.

Index	Good Fit	Acceptable Fit	DLTTS	RFES	LSS
χ^2/df	<3	$3 < \chi^2/df < 5$	3.597	3.514	2.815
GFI	>0.95	>0.90	0.915	0.976	0.994
CFI	>0.95	>0.90	0.936	0.982	0.996
RMSEA	<0.05	<0.08	0.080	0.079	0.067
Cronbach Alpha	>0.90	>0.80	0.939	0.957	0.946
Skewness	−2/+2	−2/+2	−0.117	−0.476	−0.564
Kurtosis	−2/+2	−2/+2	−0.675	−0.915	−0.523
AVE	-	>0.50	0.677	0.717	0.779
CR	-	>0.70	0.892	0.958	0.946

Note: DLTTS: Digital Leisure Time Tendency Scale, RFES: Recreational Flow Experience Scale, LSS: Leisure Satisfaction Scale; n = 402. DLTTS: correlated four-factor model without modifications; RFES: error covariances between items 1–2 and 1–5; LSS: error covariance between items 4–5. AVE and CR were calculated from standardized loadings in the joint measurement model; for the DLTTS, they refer to the second-order factor (loadings of the four subdimensions). AVE and CR of the DLTTS subdimensions are reported in Table A1.

Leisure Satisfaction Scale (LSS)

The "Leisure Satisfaction Scale," developed by Akyıldız (2013), was used to determine participants' perceived levels of leisure satisfaction derived from digital leisure activities. In the present study, the items were worded with reference to digital leisure activities (e.g., "I am satisfied with participating in digital leisure activities"; "I really enjoy participating

in digital leisure activities"). As with the RFES, the adapted form was examined post hoc with CFA in the same sample. The scale consists of 5 items rated on a 5-point Likert-type format ranging from "(1) Strongly disagree" to "(5) Strongly agree" and demonstrates a single-factor structure. In the validity and reliability analyses conducted by Akyıldız (2013), the internal consistency coefficient of the scale was reported as $\alpha = 0.85$. In the present study, the Cronbach's alpha coefficient for the Leisure Satisfaction Scale was calculated as 0.946. Higher mean scores obtained from the scale indicate higher levels of leisure satisfaction, whereas lower scores indicate lower levels of leisure satisfaction.

To evaluate the construct validity of the measurement instruments used in this study, Confirmatory Factor Analyses (CFA) were conducted. Models were estimated with maximum likelihood (ML) in the analytic sample ($n = 402$). Modifications were limited to error covariances between items with overlapping content or adjacent positions, and no items were removed. The DLTTS was tested as a correlated four-factor model (items 1–6, 7–11, 12–15, and 16–18, following the item order of the questionnaire) without modifications. DLTTS item 5 ("Using digital tools in my leisure time does not disrupt my daily tasks") had a low standardized loading ($\lambda = 0.369$). It was retained in the primary analyses to preserve the published structure of the scale and comparability with previous studies, and its influence was examined in a sensitivity analysis (Section Sensitivity Analyses). For the RFES, error covariances were specified between items 1 and 2 (the two adjacent opening items) and between items 1 and 5 ("…increases my self-confidence" and "…I feel highly motivated", both referring to self-related enhancement). For the LSS, an error covariance was specified between items 4 and 5, both of which refer to expectations ("…I get what I expected" and "…more enjoyable than I expected"). Discriminant validity was then examined in a joint measurement model including all three constructs, in which the DLTTS was specified as a second-order factor. For the DLTTS, convergent validity was evaluated at both levels: AVE and CR were computed for each first-order subdimension from its item loadings and for the second-order factor from the loadings of the four subdimensions. Finally, to examine common method variance, an unmeasured latent method construct (ULMC) that loaded on all 32 items and was uncorrelated with the substantive factors was added to the joint measurement model and to the corresponding structural model (Richardson et al., 2009).

Model fit indices, Cronbach's alpha reliability coefficients, skewness and kurtosis values, as well as Average Variance Extracted (AVE) and Composite Reliability (CR) values for the scales used in the study, are reported in Table 1. Evaluations of model fit were conducted in accordance with the goodness-of-fit criteria proposed by Byrne (2016) and Gürbüz (2021). In assessing internal consistency, the criteria suggested by George and Mallery (2019) were considered, whereby Cronbach's alpha coefficients of 0.80 or above were interpreted as indicating good reliability, and coefficients of 0.90 or above as indicating excellent reliability. In terms of structural validity, the criteria proposed by Fornell and Larcker (1981) were adopted, suggesting that AVE values should exceed 0.50 and CR values should exceed 0.70. Accordingly, the measurement models used in the present study were considered to demonstrate acceptable and sufficient levels of validity and reliability (Table 1). Standardized factor loadings from the joint measurement model are presented in Appendix A (Table A1).

Internal consistency and convergent validity were satisfactory for all scales ($\alpha \geq 0.939$; AVE ≥ 0.677; CR ≥ 0.892). At the subdimension level, AVE and CR were adequate for three of the four DLTTS subdimensions (AVE = 0.597–0.790; CR = 0.892–0.937) but not for the three-item fourth subdimension (items 16–18; AVE = 0.428; CR = 0.690). Because recreational flow experience and leisure satisfaction were strongly correlated, discriminant validity was examined in the joint measurement model (Table 2). The latent correlation between the two constructs was 0.885, which exceeded the square roots of the AVE for

both the RFES (0.847) and the LSS (0.882); thus, the Fornell–Larcker criterion was not satisfied. The HTMT ratio for the RFES and LSS was 0.917 (95% bootstrap CI [0.882, 0.947], 2000 resamples). This value exceeds both the 0.85 and the more liberal 0.90 thresholds proposed by Henseler et al. (2015). The upper limit of its confidence interval is below 1.00, which meets the original HTMT-inference criterion (Henseler et al., 2015), but it is above 0.90, so the stricter test recommended by Franke and Sarstedt (2019) is not met. The three-factor model fitted the data significantly better than a model in which the RFES and LSS items loaded on a single factor ($\Delta\chi^2(2) = 303.55$, $p < 0.001$; Anderson & Gerbing, 1988). Taken together, these results show that the two constructs are not identical, but the evidence for their discriminant validity is limited; the mediation results were interpreted with this overlap in mind.

Table 2. Discriminant Validity and Measurement Model Comparison (n = 402).

Construct Pair	Latent r	HTMT	HTMT 95% CI
DLTTS—RFES	0.778	0.773	[0.725, 0.817]
DLTTS—LSS	0.723	0.729	[0.668, 0.783]
RFES—LSS	0.885	0.917	[0.882, 0.947]
√AVE: DLTTS = 0.823; RFES = 0.847; LSS = 0.882			
Measurement model	χ^2(df)	CFI/TLI	RMSEA
Three-factor model	1241.35 (454)	0.934/0.928	0.066
RFES and LSS combined	1544.90 (456)	0.909/0.901	0.077
Single-factor model	3846.67 (461)	0.718/0.697	0.135

Note: DLTTS was specified as a second-order factor. HTMT confidence intervals are percentile bootstrap intervals (2000 resamples). Compared with the three-factor model: RFES and LSS combined, $\Delta\chi^2(2) = 303.55$, $p < 0.001$; single-factor model, $\Delta\chi^2(7) = 2605.31$, $p < 0.001$. All models include the error covariances listed under Table 1.

2.4. Ethical Approval, Procedure, and Data Collection

The data used in this study were collected in accordance with ethical principles following the approval granted by the Ethics Committee of Sakarya University of Applied Sciences (Decision No: E-26428519-050.99-220011, dated 9 April 2026). Prior to the commencement of the data collection process, all participants were informed about the purpose, scope, and voluntary nature of the study, and written informed consent was obtained from each participant. Participants were clearly informed that they had the right to withdraw from the study at any stage without providing any justification. For participants under 18 years of age, written permission was also obtained from their parents or legal guardians, in addition to the participants' voluntary agreement to participate; these participants were subsequently excluded from the analyses (see Section 2.2).

All procedures conducted within the scope of this research were carried out in accordance with the 1964 Declaration of Helsinki and current international ethical research standards. Data were collected through face-to-face administration by the researchers from individuals residing in Hatay Province who had directly experienced the 6 February 2023 earthquakes and were residing in the province at the time of data collection. Participant confidentiality was protected throughout the data collection process, and all obtained data were used solely for scientific purposes.

2.5. Data Analysis

The research data were analyzed using IBM SPSS (v25.0), the PROCESS macro (v4.2), and Python (v3.12; semopy v2.3.11; Igolkina & Meshcheryakov, 2020). Before proceeding with the analyses, the dataset was examined for missing values and outliers; no missing values were found. Mahalanobis distances and standardized Z scores were considered

in identifying outliers. The normality of the data was assessed based on skewness and kurtosis coefficients, using the range of −2 to +2 recommended by George and Mallery (2019). The results indicated that the data satisfied the assumption of normal distribution. In addition, Z scores were found to range between −3 and +3, suggesting that the dataset did not contain any serious outlier problems.

Linear relationships among the variables were examined using scatterplots, and no substantial deviations were observed in the distributions. Multicollinearity was evaluated through tolerance and Variance Inflation Factor (VIF) values. The tolerance values were above acceptable thresholds and the VIF values were below critical cutoff points, indicating the absence of multicollinearity problems. Pearson Correlation Analysis was conducted to determine the direction and magnitude of the relationships among the variables. In the correlation analysis, the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction were examined to determine whether statistically significant associations existed between the variables. The interpretation of Pearson correlation coefficients was based on the criteria recommended in the literature.

Confirmatory factor analyses (CFA), the joint measurement model, the ULMC models, and HTMT ratios were computed in Python (semopy, v2.3.11) with ML estimation. Recommended goodness-of-fit indices reported in the literature were considered in evaluating model fit. To test the research hypotheses and examine the mediation effect, PROCESS Macro (v4.2), developed by Hayes (2022), was employed. In this context, Model 4 (simple mediation model) was selected. The relationships among digital leisure orientation (X), recreational flow experience (M), and leisure satisfaction (Y) were analyzed using regression-based procedures. The significance of the mediation effect was tested using the bootstrap method with 5000 resamples (Hayes, 2022; Hayes et al., 2017). The statistical significance of the mediation effect was evaluated based on whether the 95% confidence interval (CI) included zero. The mediation models for the analytic sample (n = 402) and the sensitivity analyses were re-estimated with ordinary least squares regression and 5000 percentile bootstrap resamples, following the PROCESS Model 4 procedure (Hayes, 2022). This approach has been recognized in the literature as a reliable method for assessing mediation effects (Preacher & Hayes, 2008; Hayes, 2022). Unstandardized coefficients (B), standard errors, t and *p* values, 95% confidence intervals, standardized coefficients (β), and explained variance (R^2) are reported separately for each model. In addition to the primary model, a covariate-adjusted model including age and sex (0 = male, 1 = female) was estimated, because both variables have been linked to digital leisure participation and age was strongly correlated with digital leisure orientation in the present sample (r = −0.54). Two further sensitivity analyses were conducted: the primary model was re-estimated in the full sample (n = 425), and flow was re-scored using only the five items that describe core flow components (attention, time transformation, perceived competence, self-confidence, and motivation), excluding four items with hedonic content (enjoyable, positive, happy, and pleasurable experience) that may overlap with leisure satisfaction items.

2.6. Common Method Bias

Because all variables were measured with self-reports in a single session, common method bias (CMB) was examined with Harman's single-factor test and a CFA-based comparison. In an unrotated principal axis factoring of all 32 items, five factors had eigenvalues greater than 1; however, the first factor accounted for 51.50% of the total variance, which exceeds the commonly used 50% heuristic (Eichhorn, 2014). In the CFA-based test, a single-factor model fitted the data poorly ($\chi^2/df = 8.34$, CFI = 0.718, RMSEA = 0.135) and substantially worse than the three-factor measurement model ($\Delta\chi^2(7) = 2605.31$, $p < 0.001$), indicating that a single common factor does not account for the covariation among the items.

Nevertheless, neither test can rule out common method variance (Podsakoff et al., 2024). Given the same-session self-report design and the strong correlation between recreational flow experience and leisure satisfaction (r = 0.873), shared method variance may have inflated the observed associations, and the results were interpreted with this possibility in mind.

Because a χ^2 difference test against a single-factor model is a weak test in a sample of this size, an unmeasured latent method construct (ULMC) was also added to the joint measurement model and to the corresponding structural model. The ULMC model fitted the data better than the model without the method factor ($\chi^2(422) = 950.70$, CFI = 0.956, TLI = 0.948, RMSEA = 0.056; $\Delta\chi^2(32) = 290.66$, $p < 0.001$). The method factor accounted for an average of 45% of the item variance, compared with 23% for the substantive factors. With the method factor partialled out, the latent correlation between flow and satisfaction decreased from 0.885 to 0.737 but still exceeded the square roots of their AVEs (0.526 and 0.605), so discriminant validity between the two constructs was not established. In the structural model without the method factor, digital leisure orientation was associated with flow ($\beta = 0.778$, $p < 0.001$), flow was associated with satisfaction ($\beta = 0.818$, $p < 0.001$), the direct path was not significant ($\beta = 0.086$, $p = 0.091$), and the standardized indirect effect was 0.636. In the structural model with the method factor, digital leisure orientation was no longer significantly associated with flow ($\beta = 0.112$, $p = 0.325$), whereas flow remained associated with satisfaction ($\beta = 0.740$, $p < 0.001$); the standardized indirect effect fell to 0.083 and was not significant (95% bootstrap CI [−0.135, 0.424]; 1000 resamples). However, this solution was improper because the disturbance variance of the first DLTTS subdimension was estimated at zero. Therefore, the ULMC estimates should be interpreted with caution. These results can be explained in two ways. First, common method variance may have inflated the associations among the self-reported variables. Second, since all 32 items reflect positive evaluations of digital leisure, the method factor may also have absorbed substantive shared variance, which is a known limitation of the ULMC approach (Richardson et al., 2009). Because the present data do not allow these two explanations to be separated, the indirect effect cannot be considered robust to common method variance.

3. Results

When Table 3 is examined, statistically significant and positive relationships are observed among digital leisure orientation, recreational flow experience, and leisure satisfaction. According to the analysis results, a strong positive relationship was found between digital leisure orientation and recreational flow experience (r = 0.733, $p < 0.01$). In addition, a moderate-to-strong positive relationship was identified between digital leisure orientation and leisure satisfaction (r = 0.687, $p < 0.01$). A strong positive and statistically significant relationship was also found between recreational flow experience and leisure satisfaction (r = 0.873, $p < 0.01$). These findings indicate that the relationships among the variables are strong and positive, and particularly that recreational flow experience is highly associated with leisure satisfaction.

The results of the mediation model are presented in Figure 2 and Table 4. Digital leisure orientation was positively associated with recreational flow experience (H_2; path a: B = 1.445, SE = 0.067, $\beta = 0.733$, $p < 0.001$), and recreational flow experience was positively associated with leisure satisfaction (H_3; path b: B = 0.489, SE = 0.022, $\beta = 0.796$, $p < 0.001$). The total effect of digital leisure orientation on leisure satisfaction was positive and significant (H_1; path c: B = 0.832, SE = 0.044, $\beta = 0.687$, $p < 0.001$), and the direct effect remained significant when flow was included in the model (path c′: B = 0.126, SE = 0.043, $\beta = 0.104$, $p = 0.004$). The bootstrap analysis showed a significant indirect effect through recreational flow experience (H_4; a × b: B = 0.707, Boot SE = 0.045, 95% CI [0.618, 0.796]; completely standardized indirect effect = 0.583, 95% CI [0.520, 0.647]). Because

the confidence interval did not include zero and the direct effect remained significant, the results indicate a statistical indirect association alongside a smaller direct association. These results should be interpreted as statistical associations because the cross-sectional design does not permit conclusions regarding temporal precedence or causality. However, as reported in Section 2.6, this indirect effect did not remain significant when a latent method factor was included. The observed-variable results support H_1–H_3. H_4 was supported in the observed-variable analyses but not when common method variance was modeled.

Table 3. Correlations Among Variables and Descriptive Statistics.

Variables	DLTTS	RFES	LSS	X	SD
DLTTS	1			2.821	0.867
RFES	0.733 **	1		4.451	1.710
LSS	0.687 **	0.873 **	1	3.251	1.050

Note: ** $p < 0.01$; DLTTS: Digital Leisure Time Tendency Scale, RFES: Recreational Flow Experience Scale, LSS: Leisure Satisfaction Scale; n = 402.

Table 4. Regression Results of the Mediation Model (PROCESS Model 4; n = 402).

Outcome/Predictor	B	SE	t	*p*	95% CI	β
Model 1: Flow experience (M)						
Digital leisure orientation (a)	1.445	0.067	21.52	<0.001	[1.313, 1.577]	0.733
Constant	0.374	0.198	1.89	0.060	[−0.016, 0.764]	–
$R^2 = 0.537$, $F(1, 400) = 463.18$, $p < 0.001$						
Model 2: Leisure satisfaction (Y)						
Digital leisure orientation (c′)	0.126	0.043	2.93	0.004	[0.041, 0.210]	0.104
Flow experience (b)	0.489	0.022	22.41	<0.001	[0.446, 0.532]	0.796
Constant	0.720	0.087	8.29	<0.001	[0.549, 0.890]	–
$R^2 = 0.767$, $F(2, 399) = 654.96$, $p < 0.001$						
Total effect model: Leisure satisfaction (Y)						
Digital leisure orientation (c)	0.832	0.044	18.93	<0.001	[0.746, 0.919]	0.687
$R^2 = 0.473$, $F(1, 400) = 358.36$, $p < 0.001$						
Indirect effect (a × b)	0.707	0.045 [a]	–	–	[0.618, 0.796] [b]	0.583 [0.520, 0.647]

Note: B = unstandardized coefficient; SE = standard error; β = standardized coefficient. [a] Bootstrap standard error. [b] Percentile bootstrap confidence interval (5000 resamples); the standardized indirect effect is the completely standardized indirect effect with its bootstrap 95% CI.

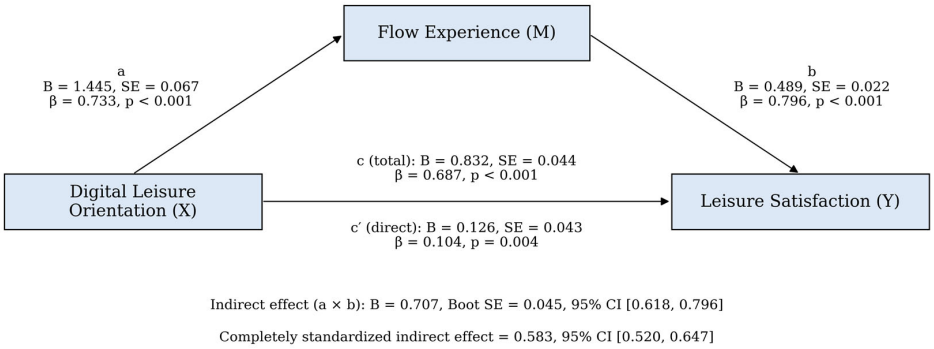

Figure 2. Mediation model of the association between digital leisure orientation and leisure satisfaction through flow experience. a = effect of digital leisure orientation on flow experience; b = effect of flow experience on leisure satisfaction, controlling for digital leisure orientation; c = total effect of digital leisure orientation on leisure satisfaction; c′ = direct effect of digital leisure orientation on leisure satisfaction, controlling for flow experience; B = unstandardized coefficient; SE = standard error; Boot SE = bootstrap standard error; β = standardized coefficient; CI = confidence interval.

In the model in which flow experience was the outcome, digital leisure orientation explained approximately 54% of the variance ($R^2 = 0.537$; $F(1, 400) = 463.18$, $p < 0.001$). In the model in which leisure satisfaction was the outcome, digital leisure orientation (c′: B = 0.126, β = 0.104, $p = 0.004$) and recreational flow experience (b: B = 0.489, β = 0.796, $p < 0.001$) together explained approximately 77% of the variance ($R^2 = 0.767$; $F(2, 399) = 654.96$, $p < 0.001$). The indirect effect accounted for a large share of the total association (0.707 of 0.832).

Sensitivity Analyses

Table 5 compares the primary estimates with those from the covariate-adjusted model, the full sample, and the core-flow scoring. Estimates in the full sample (n = 425) were nearly identical to those in the analytic sample. After adjustment for age and sex, path a and the indirect effect became somewhat smaller (indirect B = 0.630, 95% CI [0.537, 0.722]; standardized = 0.520), but their confidence intervals overlapped substantially with those of the primary model. Age was negatively associated with flow experience (B = −0.017, SE = 0.006, $p = 0.002$) and with leisure satisfaction in the total effect model (B = −0.013, SE = 0.004, $p < 0.001$), whereas sex was not significantly associated with either variable ($p \geq 0.198$). When flow was scored using only the five core flow items (α = 0.905), its correlation with leisure satisfaction remained high (r = 0.857; HTMT = 0.926, 95% CI [0.893, 0.957]), and the indirect effect remained significant (B = 0.653, 95% CI [0.568, 0.738]; standardized = 0.539). Thus, the strong overlap between flow and satisfaction did not arise only from items with hedonic content. When DLTTS item 5 was excluded, the fit of the DLTTS model was similar (CFI = 0.940, RMSEA = 0.083, compared with CFI = 0.936, RMSEA = 0.080), the AVE of the first subdimension increased from 0.597 to 0.689, the 17-item and 18-item scores correlated at r = 0.997, and the indirect effect was virtually unchanged (B = 0.690, 95% CI [0.604, 0.776]; standardized = 0.583).

Table 5. Sensitivity of the Mediation Estimates Across Samples, Covariates, Flow Scoring, and Item Exclusion.

Model	a	b	c′	Indirect (a × b)	Std. Indirect
Primary (n = 402)	1.445 [1.313, 1.577]	0.489 [0.446, 0.532]	0.126 [0.041, 0.210]	0.707 [0.618, 0.796]	0.583 [0.520, 0.647]
+ Age and sex (n = 402)	1.302 [1.146, 1.457]	0.484 [0.441, 0.527]	0.100 [0.011, 0.188]	0.630 [0.537, 0.722]	0.520 [0.446, 0.592]
Full sample (n = 425)	1.414 [1.287, 1.542]	0.493 [0.452, 0.534]	0.130 [0.050, 0.210]	0.697 [0.613, 0.779]	0.579 [0.518, 0.638]
Core flow items (n = 402)	1.416 [1.282, 1.551]	0.461 [0.417, 0.505]	0.179 [0.093, 0.266]	0.653 [0.568, 0.738]	0.539 [0.477, 0.599]
DLTTS without item 5 (n = 402)	1.408 [1.279, 1.538]	0.490 [0.447, 0.532]	0.121 [0.039, 0.204]	0.690 [0.604, 0.776]	0.583 [0.521, 0.645]

Note: Values are unstandardized coefficients with 95% confidence intervals; indirect effects use percentile bootstrap intervals (5000 resamples). Sex was coded 0 = male, 1 = female. Core flow items: RFES items 1, 2, 5, 7, and 9.

4. Discussion

This study examined the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction within the framework of a mediation model among adults living in an earthquake-affected region. The findings revealed that digital leisure orientation was positively associated with leisure satisfaction and that this association included a statistically significant indirect component through recreational flow experience.

However, this indirect component was no longer significant when common method variance was modeled, and it may largely reflect a shared positive evaluation of digital leisure. These results suggest that digital leisure behaviors should not be regarded merely as forms of technological use or time-passing activities; rather, they represent a multidimensional construct associated with individuals' level of engagement, enjoyment derived from activities, and perceived satisfaction. In a post-disaster setting, digital leisure activities may offer accessible spaces in which individuals divert their attention from adverse external conditions and obtain experiential satisfaction, although the present data do not show whether such experiences contribute to recovery. In this respect, the present study provides an integrative statistical framework for examining how digital leisure experiences are associated with leisure-related outcomes among individuals living in a post-earthquake context.

The findings obtained in this study are consistent with previous research examining the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction. Studies conducted within the context of digital leisure have demonstrated that individuals' leisure experiences in digital environments are associated with psychological outcomes such as flow experience and leisure satisfaction. Er and Cengiz (2023) reported that participation motives in digital leisure activities positively affected digital leisure flow experience and leisure satisfaction. The same study further indicated that digital leisure flow experience mediated the relationship between participation motives in digital leisure and leisure satisfaction. These findings are consistent with the present study, in which a statistically significant indirect association between digital leisure orientation and leisure satisfaction through recreational flow experience was observed, although it disappeared when common method variance was modeled (Er & Cengiz, 2023).

One of the recent studies supporting the relationship between digital leisure orientation and leisure satisfaction was conducted by Özdemir and Koçakulak (2026). The researchers investigated the effect of digital sports participation on leisure satisfaction and found that digital sports participation was associated with the level of satisfaction individuals derived from their leisure experiences. Although the study did not directly address the construct of digital leisure orientation, it demonstrated that sport- and recreation-based activities carried out through digital technologies may constitute meaningful experiential domains in terms of leisure satisfaction. In this regard, the findings reported by Özdemir and Koçakulak (2026) complement the present study by suggesting that leisure activities performed in digital environments may support individuals' satisfaction levels.

Another study supporting the effect of digital leisure orientation on flow experience was conducted by Er and Cengiz (2025). Their study examined the relationships between internet usage purposes within the scope of digital leisure and digital leisure flow experience, revealing that internet use for social interaction and information/personal development purposes was positively associated with flow experience and significantly predicted this construct. These findings support the present study's result indicating that digital leisure orientation is positively associated with recreational flow experience. Accordingly, the way individuals engage in digital leisure activities may strengthen processes such as intense concentration, intrinsic enjoyment, and immersion during activities (Er & Cengiz, 2025).

Studies demonstrating the relationship between flow experience and leisure satisfaction also parallel the findings of the present research. Lee et al. (2019), in a study conducted with university students, found that leisure involvement was associated with flow experience, that higher levels of flow experience enhanced emotional, psychological, and social leisure satisfaction, and that flow experience mediated the relationship between leisure involvement and leisure satisfaction. These findings are consistent with the present study, in which recreational flow experience was strongly associated with leisure satisfaction within the tested mediation model (Lee et al., 2019).

Similarly, Ayhan and Eskiler (2024) examined the mediating role of recreational flow experience in the relationship between leisure attitude and happiness, concluding that recreational flow experience represents an important mechanism underlying positive leisure-related psychological outcomes. Although their study was not conducted specifically within the context of digital leisure, it is consistent with the indirect association observed in the present research by demonstrating the explanatory role of flow experience in positive outcomes derived from leisure experiences (Ayhan & Eskiler, 2024). In another study, Kara and Karaca (2026) investigated the relationships among recreational area preferences, leisure satisfaction, and flow experience, reporting that leisure satisfaction mediated the relationship between recreational area preferences and flow experience. Although the direction of the tested model differed from that of the present study, these findings suggest that leisure satisfaction and flow experience are not independent constructs but rather psychological processes that can be evaluated together within the quality of leisure experiences (Kara & Karaca, 2026). Furthermore, Ayhan's (2022) doctoral dissertation conducted with individuals regularly participating in recreational activities demonstrated that leisure involvement, recreational flow experience, recreational benefits, and leisure satisfaction were significant predictors of re-participation intention. These findings support the present study by indicating that recreational flow experience and leisure satisfaction are central variables in explaining leisure behaviors (Ayhan, 2022). Taken together with previous studies, the positive relationships identified in the present research among digital leisure orientation, recreational flow experience, and leisure satisfaction appear to be consistent with the existing literature.

From a theoretical perspective, the findings suggest that Uses and Gratifications Theory provides an appropriate framework for explaining digital leisure behaviors. According to this theory, individuals do not passively consume media and digital platforms; instead, they actively use them to satisfy specific psychological, social, and emotional needs. The finding that digital leisure orientation was associated with leisure satisfaction suggests that individuals may use digital environments not only to spend their free time but also to achieve relaxation, social interaction, attentional diversion, and experiential gratification. This perspective indicates that digital media use may function as a regulatory domain shaped according to individuals' needs (Brand et al., 2019; Büchi, 2024; Ruggiero, 2000; Valkenburg & Peter, 2013).

From the perspective of Self-Determination Theory, digital leisure orientation may support individuals' basic psychological needs such as autonomy, competence, and relatedness. The ability to select activities based on personal preferences, establish social interactions, and experience a sense of control within digital environments may represent important factors contributing to leisure satisfaction. In this regard, the present findings indicate that digital leisure experiences have the potential to generate satisfaction through intrinsic motivation and need fulfillment (Nabi et al., 2013; Przybylski et al., 2010; Reinecke & Oliver, 2016; Ryan & Deci, 2017).

Within the framework of Flow Theory, recreational flow experience was closely associated with both digital leisure orientation and leisure satisfaction in the present model. Flow experience is characterized by intense concentration on an activity, disengagement from external stimuli, altered time perception, and intrinsic enjoyment derived from the activity itself. The finding that recreational flow experience was strongly associated with leisure satisfaction and yielded a statistically significant indirect association in the observed-variable analyses, although this association was sensitive to common method variance, suggests that the quality of recreational experience may be relevant to the association between digital leisure orientation and leisure satisfaction. Because both flow and satisfaction were rated with reference to participants' digital leisure activities, the findings concern experiences

within digital leisure rather than recreation in general. Nevertheless, the cross-sectional design does not establish that digital leisure orientation generated these experiences; rather, individuals with higher digital leisure orientation also reported more flow and greater satisfaction in their digital leisure. Moreover, given the strong overlap between flow and satisfaction (Table 2), part of the indirect association may reflect a shared positive evaluation of digital leisure experiences rather than a fully distinct psychological mechanism. The ULMC analysis supports this interpretation, because the association between digital leisure orientation and flow, and thus the indirect effect, was no longer significant when a common method factor was added. This result is also consistent with approaches suggesting that flow experience is associated with user satisfaction and experiential gratification in human–computer interaction, online experiences, and recreational activities (Csikszentmihalyi, 1990; Ghani & Deshpande, 1994; Hoffman & Novak, 2009; Webster et al., 1993).

Considering the contemporary context in which digitalization has transformed leisure experiences, flow experience may emerge not only in game- or entertainment-based digital environments but also in social media use, online learning, and broader digital interaction processes. Such experiences have been associated with user satisfaction, behavioral continuance intention, and psychological well-being (Footitt et al., 2025; Teng, 2018; Yao et al., 2023). Nevertheless, flow experience should not always be conceptualized solely as a construct producing positive outcomes. In certain situations, intense concentration, distorted time perception, and weakened behavioral control may also be associated with problematic usage tendencies. However, within the recreational context of the present study, flow experience was positively associated with leisure satisfaction, although this does not rule out problematic patterns of use that were not measured here (Gong et al., 2021).

Finally, when the digital leisure literature is evaluated as a whole, digital platforms appear to possess considerable potential to support flow experience due to their interactive structures, instant feedback mechanisms, and designs encouraging active user participation. These characteristics may facilitate more intensive engagement in digital leisure activities and increase the level of satisfaction derived from such activities (Peifer et al., 2020; Sailer et al., 2017). Nevertheless, digital leisure should not be viewed exclusively as an adaptive or beneficial form of leisure participation. Previous research has also highlighted potential negative consequences of intensive digital engagement, including excessive screen time, problematic internet use, digital dependency, and reduced participation in face-to-face social or physical recreational activities. The outcomes of digital leisure may therefore depend on factors such as the intensity, purpose, and context of use. In particular, although flow experience may contribute to enjoyment and leisure satisfaction, highly immersive digital experiences may also be associated with difficulties in regulating use or maintaining behavioral control in some circumstances (Gong et al., 2021). The present study did not directly assess problematic digital use, screen time, or offline recreational participation; therefore, these potential negative consequences cannot be inferred from the current findings. Rather, they represent important considerations for interpreting digital leisure within a broader and more balanced framework and provide directions for future research. In this respect, the present findings indicate that a substantial part of the association between digital leisure orientation and leisure satisfaction was statistically accounted for by flow experience. Conducting the study with individuals who had directly experienced the 6 February 2023 earthquakes and were residing in Hatay Province at the time of data collection provides a contextual contribution to the digital leisure literature.

The findings should also be read in light of the digital divide. Access to digital leisure is not evenly distributed. Inequalities in physical access and digital skills are related to age and socioeconomic position (van Dijk, 2020), and unequal access to digital media after a disaster can deepen existing social inequalities (Madianou, 2015). In the post-earthquake

setting of the present study, access may have been further limited by the loss of devices, the cost of mobile data, and weak internet connections in temporary shelters and container cities. It is therefore necessary to distinguish between individuals who choose not to engage in digital leisure and those who are structurally prevented from doing so. Because the present sample consisted of individuals who were able to report on their digital leisure activities, it is likely biased toward residents with access, and the findings cannot be generalized to those excluded from digital environments. Madianou (2015) showed that unequal access to digital media after a disaster can deepen existing social inequalities. Accordingly, the present findings should not be read as evidence that disaster-affected people can manage their difficulties on their own through smartphones, nor should they be used to justify reducing in-person psychosocial or physical support for older or digitally disadvantaged residents.

If digital leisure is to function as an equitable resource in post-disaster settings, it needs to be accompanied by public measures that remove environmental barriers, drawing by analogy on the principle of reasonable accommodation, which the Convention on the Rights of Persons with Disabilities defines as necessary and appropriate adjustments that ensure equal enjoyment of rights for persons with disabilities (United Nations, 2006). Such measures may include free Wi-Fi and device-lending in shelters and container settlements, subsidized connectivity for low-income households, and digital literacy support for older adults and other digitally disadvantaged groups. Digital provision should complement, not replace, face-to-face recreational and psychosocial services.

These points are also important for the theoretical interpretation of digital leisure orientation. Uses and gratifications theory and self-determination theory explain media use mainly through individual needs and choices. In post-disaster settings, however, the options available to individuals are also shaped by material conditions. A low score on the digital leisure orientation scale may therefore indicate either a weak preference or a limited opportunity, and these two cannot be separated unless access is measured. Future studies should measure device ownership, internet connection, data costs, and digital skills together with digital leisure orientation, and they should examine whether the relationships found in this study differ between residents with secure and insecure access. In practice, reasonable accommodation in this context means that local governments and disaster management authorities, in cooperation with telecommunication companies and non-governmental organizations, should include digital access in post-disaster needs assessments. Support for digital access should be planned in addition to face-to-face recreational programs for residents who cannot or do not wish to use digital tools.

4.1. Strengths

One of the primary strengths of this study is that it examines the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction within the specific and vulnerable context of the individuals living in a post-earthquake setting. Data from residents of a severely affected province are scarce in the digital leisure literature, and the study provides associational evidence from this setting.

Another important strength of the research is that the relationship between digital leisure orientation and leisure satisfaction was not examined solely at the level of a direct association; rather, the explanatory role of recreational flow experience within this relationship was also tested. This approach allows experiential processes such as focused engagement, immersion in experience, intrinsic enjoyment, and alterations in time perception to be considered in relation to satisfaction with digital leisure. In this regard, the study provides a statistical framework that places the quality of experience at the center of the relationship between digital leisure behaviors and psychological outcomes.

From a theoretical perspective, relating the study to Uses and Gratifications Theory, Self-Determination Theory, and Flow Theory contributes to a more comprehensive interpretation of the relationships among the variables. This theoretical framework enables digital leisure orientation to be evaluated not only in terms of technological usage habits but also in relation to individuals' need satisfaction, intrinsic motivation, search for social interaction, and optimal experiential states.

From a methodological standpoint, the indirect effect was tested with bootstrap confidence intervals in an analytic sample of 402 adults, and the estimates were compared across a covariate-adjusted model and several sensitivity analyses. Furthermore, the fact that the study was conducted with individuals residing in Hatay Province who were affected by the 6 February 2023 Kahramanmaraş earthquakes provides contextual value to the research.

4.2. Limitations

Several limitations should be considered when interpreting the findings of this study. First, the study employed a cross-sectional design. Longitudinal, experimental, or quasi-experimental research is needed to examine temporal ordering and potential causal relationships among these variables. Although the mediation analysis identified a statistically significant indirect association between digital leisure orientation and leisure satisfaction through recreational flow experience, this finding does not establish temporal precedence or a causal mechanism. Alternative explanations, including reverse or reciprocal relationships, remain possible. Therefore, the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction should not be interpreted within a causal framework. The findings demonstrate statistical relationships among the variables and the indirect effect tested within the proposed model. Since leisure experiences in post-disaster settings may change over time, the current design is limited in explaining the direction, continuity, and reciprocal interactions of these variables throughout the process.

Second, all data were collected through self-report scales in a single session. The first factor in Harman's test explained more than 50% of the variance, and although a single-factor model fitted the data poorly, common method variance cannot be ruled out and may have inflated the observed associations. When a latent method factor was modeled, the indirect effect was no longer significant (Section 2.6). Although this approach may also remove substantive shared variance (Richardson et al., 2009), the indirect effect cannot be considered robust to common method variance. Responses may also have been influenced by social desirability, recall bias, or participants' psychological state at the time of data collection. Relatedly, recreational flow experience and leisure satisfaction overlapped substantially ($r = 0.873$; latent $r = 0.885$; HTMT = 0.917). Although the two constructs were separable according to the model comparison and the original HTMT-inference criterion, they did not meet the Fornell–Larcker criterion or the stricter HTMT test against 0.90 (Franke & Sarstedt, 2019), and several flow items (e.g., enjoyable, pleasurable, and happy experience) are evaluative in content. Scoring flow with only its core items did not reduce this overlap, which suggests that the overlap does not arise solely from item wording. Part of the indirect effect may nonetheless reflect a shared positive evaluation of digital leisure experiences rather than a distinct psychological mechanism. Future research should use flow measures focused on its core components (e.g., concentration, time transformation, and challenge–skill balance) and collect mediator and outcome data at different time points or from different sources.

Third, the study was conducted exclusively with individuals who had directly experienced the 6 February 2023 earthquakes and were residing in Hatay Province at the time of data collection. Although this context provides a specific and valuable setting for the study, data were collected approximately three years after the earthquake. No measures of post-disaster adaptation, resilience, coping, trauma-related symptoms, or recovery were

included; the earthquake therefore defines the context of the sample rather than a process examined by the model. Therefore, the present study does not allow us to determine the extent to which participants were at similar stages of post-earthquake adaptation or to establish whether their current experiences were directly related to the disaster. In addition, information regarding participants' housing status, displacement history, degree of economic recovery, and continuing disaster-related challenges was not systematically collected. The absence of these contextual variables limits the ability to distinguish associations related specifically to post-earthquake adaptation from those reflecting broader individual, social, or environmental conditions. Future studies should incorporate detailed indicators of post-disaster living conditions and recovery trajectories to better characterize participants' adaptation stages and contextualize the observed relationships. In addition, although participants were recruited through direct face-to-face contact, the number of individuals who were approached but declined participation was not systematically recorded during the data collection process. Therefore, a precise response rate could not be calculated. The absence of this information limits the ability to assess the extent of potential non-response or selection bias in the sample. Age and sex were included in a covariate-adjusted model, and the indirect effect remained significant; however, educational level, employment status, socioeconomic status, housing status (e.g., temporary versus permanent housing), severity of disaster impact, and access to digital technology were not collected, so residual confounding cannot be excluded. Future studies should include these variables.

Fourth, digital leisure orientation was addressed as a general construct in the present study. Variables such as types of digital activities, duration of use, platform preferences, levels of digital literacy, and access to technology were not examined separately. Consequently, the present study cannot determine which specific digital leisure activities are more influential in shaping recreational flow experience and leisure satisfaction. Particularly in post-disaster contexts, factors such as access to digital infrastructure, device ownership, and digital competence may represent important determinants of satisfaction derived from digital leisure experiences. In addition, flow and satisfaction were rated with reference to participants' digital leisure activities in general rather than to a specific activity, so the study cannot identify which activities were associated with these experiences. The original RFES and LSS were also developed for recreational activities in general. Their adaptation to the digital context was examined only post hoc, with CFA in the same sample ($n = 402$) that was used to test the hypotheses. Therefore, their construct validity and measurement invariance have not been tested in an independent sample, which is a methodological limitation. In addition, DLTTS item 5 had a low loading, and the three-item fourth subdimension of the DLTTS did not reach conventional thresholds for convergent validity ($AVE = 0.428$; $CR = 0.690$).

An additional limitation concerns the age range of the sample. Participants younger than 18 years ($n = 20$) were excluded because the DLTTS was developed for adults, and participants older than 65 years ($n = 3$) were excluded because this group was too small to be analyzed meaningfully. Consequently, the findings apply to adults aged 18–65 years and cannot be generalized to adolescents or older adults, who may face the greatest barriers to digital access in post-disaster settings.

Finally, recreational flow experience was the only mediator included in the research model. The exclusion of variables such as psychological resilience, perceived stress, social support, emotion regulation strategies, subjective well-being, and digital addiction tendencies limits the explanation of the relationship between digital leisure orientation and leisure satisfaction within a broader psychological framework.

4.3. Future Directions

Future studies are recommended to employ longitudinal designs in order to examine changes over time in the relationships among digital leisure orientation, recreational flow experience, and leisure satisfaction. Longitudinal research may provide a more detailed understanding of how digital leisure behaviors, flow experience, and satisfaction evolve during dynamic psychological processes such as post-disaster adaptation. In addition, experimental or quasi-experimental designs could offer opportunities to evaluate the effects of different digital leisure activities on flow experience and leisure satisfaction under more controlled conditions. Future studies should also include direct measures of post-disaster adaptation, resilience, and recovery to examine whether digital leisure experiences are related to these outcomes.

Future research may also benefit from distinguishing among subtypes of digital leisure activities. Social media use, digital gaming, online sports applications, video-based content, online learning environments, and social interaction platforms may produce different levels of flow experience and satisfaction among individuals. Examining these activity types within separate models may contribute to identifying which forms of digital leisure use are associated with more intense flow experiences and higher levels of leisure satisfaction.

It is also important for future studies to incorporate variables such as psychological resilience, perceived stress, social support, emotion regulation strategies, subjective well-being, and digital addiction tendencies into the research model. Including these variables may enable digital leisure behaviors to be evaluated not only in relation to positive psychological outcomes but also in terms of potential problematic usage patterns. Such an approach may allow the adaptive and potentially maladaptive aspects of flow experience to be examined in a more balanced manner. Moreover, similar models should be tested among groups experiencing different types of disasters, across different age categories, and within diverse cultural contexts. In particular, including variables such as rural–urban differences, socioeconomic status, digital literacy, and access to technology may contribute to a better understanding of the context-sensitive nature of digital leisure experiences. Finally, mixed-methods studies supported by qualitative data may allow for a more in-depth examination of the meanings individuals attribute to digital leisure activities, flow experience, and leisure satisfaction.

5. Conclusions

This study examined the relationships among digital leisure orientation, flow experience, and leisure satisfaction among adults living in Hatay approximately three years after the 6 February 2023 earthquakes. Digital leisure orientation was positively associated with flow and with satisfaction in digital leisure, and a statistically significant indirect association through flow was observed in the observed-variable analyses. However, this indirect association did not remain significant when common method variance was modeled. Given the strong measurement overlap between flow and satisfaction (HTMT = 0.917), the observed statistical indirect effect may largely reflect a shared, general positive evaluation of digital leisure, rather than an independent psychological mechanism.

From a theoretical perspective, the study addresses the motivational, experiential, and satisfaction-oriented dimensions of digital leisure behaviors within the frameworks of Uses and Gratifications Theory, Self-Determination Theory, and Flow Theory. This integrative approach indicates that explaining the relationship between digital leisure orientation and leisure satisfaction requires consideration not only of the level of digital use but also of the quality of the experience itself. In particular, the findings suggest that the quality of experience during digital leisure, including concentration, immersion, and enjoyment, is closely linked to how satisfying these activities are perceived to be, although the present data cannot clearly separate these two evaluations.

Conducting the study among individuals who had directly experienced the 6 February 2023 earthquakes and continued to reside in Hatay Province at the time of data collection provides a contextual contribution to digital leisure literature. The findings suggest that digital leisure activities may represent a relevant domain for examining leisure-related outcomes among individuals living in a post-disaster context. Nevertheless, considering the cross-sectional correlational design of the study, the findings should be interpreted in terms of statistical associations and the mediation model tested rather than as evidence of causal relationships. The observed statistical mediation does not establish temporal precedence or demonstrate that digital leisure orientation causes greater leisure satisfaction through recreational flow experience. Because adaptation, resilience, emotional regulation, and recovery were not measured, no conclusions can be drawn about the role of digital leisure in post-disaster recovery. From a practical standpoint, any use of digital leisure in post-disaster settings should be accompanied by measures that ensure equitable access, so that digitally disadvantaged residents are not left behind.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/bs16112023/s1, Supplementary File S1, Items, stems, and response formats of the scales used in the study.

Author Contributions: Conceptualization, M.I., R.Y., C.A. and L.-G.T.; methodology, M.I., R.Y., C.A. and Y.Ş.; formal analysis, M.I. and C.A.; investigation, M.I., R.Y., C.A. and Y.Ş.; data curation, M.I. and C.A.; writing—original draft preparation, M.I., R.Y., C.A., L.-G.T., A.B. and L.N.; writing—review and editing, M.I., R.Y., C.A., L.-G.T. and M.C.; funding acquisition, L.-G.T., A.B., L.N. and M.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Sakarya University of Applied Sciences (protocol code E-26428519-050.99-220011 and date of approval: 9 April 2026).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the corresponding authors on request.

Acknowledgments: During the preparation of this manuscript, the authors did not use any generative artificial intelligence (AI) or AI-assisted technologies in the conception, writing, editing, or preparation of the work. The authors take full responsibility for the accuracy and integrity of this study.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

DLTTS	Digital Leisure Time Tendency Scale
RFES	Recreational Flow Experience Scale
LSS	Leisure Satisfaction Scale
CFA	Confirmatory Factor Analyses
AVE	Average Variance Extracted
CR	Composite Reliability
GFI	Goodness-of-Fit Index
CFI	Comparative Fit Index
χ^2/df	Chi-Square/Degrees of Freedom
VIF	Variance Inflation Factor
CI	Confidence Interval
CMB	Common Method Bias

Appendix A

Table A1. Standardized Factor Loadings in the Joint Measurement Model (n = 402).

Factor	Item	λ
DLTTS—Subdimension 1 (items 1–6)	Item 1	0.725
	Item 2	0.894
	Item 3	0.907
	Item 4	0.885
	Item 5	0.369
	Item 6	0.716
DLTTS—Subdimension 2 (items 7–11)	Item 7	0.789
	Item 8	0.844
	Item 9	0.692
	Item 10	0.838
	Item 11	0.780
DLTTS—Subdimension 3 (items 12–15)	Item 12	0.820
	Item 13	0.916
	Item 14	0.894
	Item 15	0.921
DLTTS—Subdimension 4 (items 16–18)	Item 16	0.616
	Item 17	0.725
	Item 18	0.614
DLTTS second-order: Subdimension 1		0.826
DLTTS second-order: Subdimension 2		0.879
DLTTS second-order: Subdimension 3		0.883
DLTTS second-order: Subdimension 4		0.687
RFES	Item 1	0.753
	Item 2	0.757
	Item 3	0.914
	Item 4	0.902
	Item 5	0.844
	Item 6	0.899
	Item 7	0.822
	Item 8	0.882
	Item 9	0.830
LSS	Item 1	0.859
	Item 2	0.935
	Item 3	0.932
	Item 4	0.838
	Item 5	0.843

Note: All loadings were significant ($p < 0.001$). Error covariances: RFES items 1–2 (0.089) and 1–5 (0.120); LSS items 4–5 (0.085). Model fit: $\chi^2(454) = 1241.35$, CFI = 0.934, TLI = 0.928, RMSEA = 0.066. AVE/CR of the DLTTS subdimensions: items 1–6 = 0.597/0.893; items 7–11 = 0.625/0.892; items 12–15 = 0.790/0.937; items 16–18 = 0.428/0.690. Second-order DLTTS factor: AVE = 0.677 (√AVE = 0.823), CR = 0.892. AVE and CR were computed from the unrounded loadings.

References

Akyıldız, M. (2013). *Ciddi ve kayıtsız katılımcıların kişilik özellikleri ile boş zaman tatmini ve yaşam tatmini arasındaki ilişki* [Ph.D. thesis, Anadolu Üniversitesi, Sağlık Bilimleri Enstitüsü].

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. [CrossRef]

Ayhan, C. (2022). *Serbest zaman ilgilenimi, rekreasyonel akış deneyimi, rekreasyonel fayda ve serbest zaman tatmininin tekrar katılım niyeti üzerine etkisi* [Unpublished Ph.D. thesis, Sakarya Uygulamalı Bilimler Üniversitesi, Lisansüstü Eğitim Enstitüsü].

Ayhan, C., & Eskiler, E. (2024). The relationship between leisure attitude and happiness: The mediating effect of recreational flow experience. *International Journal of Recreation and Sports Science*, *8*(1), 117–125. [CrossRef]

Ayhan, C., Eskiler, E., & Soyer, F. (2020). Measuring flow experience in recreational participants: Scale development and validation: Rekreasyonel katılımcılarda akış deneyiminin ölçülmesi: Ölçek geliştirme ve doğrulama. *Journal of Human Sciences*, *17*(4), 1297–1311. [CrossRef]

Bayram, A., Yalcin, I., Sahin, E., Ekinci, N. E., Talaghir, L. G., & Iconomescu, T. M. (2025). The role of recreational flow experience and well-being on re-participation intention: Recreational sport participants. *Frontiers in Psychology*, *16*, 1574337. [CrossRef] [PubMed]

Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2024). Social media use and adolescents' well-being: Developing a typology of person-specific effect patterns. *Communication Research*, *51*(6), 691–716. [CrossRef]

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience & Biobehavioral Reviews*, *104*, 1–10. [CrossRef] [PubMed]

Büchi, M. (2024). Digital well-being theory and research. *New Media & Society*, *26*(1), 172–189. [CrossRef]

Byrne, B. M. (2016). *Structural equation modeling with AMOS*. Routledge.

Chen, S. T., Hyun, J., Graefe, A. R., Mowen, A. J., Almeida, D. M., & Sliwinski, M. J. (2022). The influence of leisure engagement on daily emotional well-being. *Leisure Sciences*, *44*(7), 995–1012. [CrossRef] [PubMed]

Christensen, L. B., Johnson, R. B., & Turner, L. A. (2015). *Araştırma yöntemleri desen ve analiz* (A. Aypay, Trans.). Anı Yayıncılık.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper & Row.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268. [CrossRef]

Del Missier, F., Savadori, L., Galvagni, A., Pezzi, E., Scurci, G., Patacca, A., Dolce, M., & Di Bucci, D. (2026). Echoes of the earthquake: Evidence-based suggestions for the management of psychological consequences of earthquakes. *Journal of Risk Research*, *29*, 1–11. [CrossRef]

Duman, G., Bulut, Ç., & Duman, S. (2025). Spor Bilimleri alanında deprem ve depremin psikososyal etkileri üzerine Türkiye'de yapılan araştırmaların sistematik incelemesi. *Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *12*(1), 121–136. [CrossRef]

Eichhorn, B. R. (2014). *Common method variance techniques. Cleveland State University, Department of operations & supply chain management* (Vol. 1). SAS Institute Inc.

Er, B., & Cengiz, R. (2023). The effect of digital leisure participation purposes on flow experience and leisure satisfaction [Special issue]. *Journal of ROL Sport Sciences*, *(1)*, 544–565. [CrossRef]

Er, B., & Cengiz, R. (2025). The form of happiness in the digital age: Examining the effect of internet usage in digital leisure on flow experience. *International Journal of Recreation and Sport Science*, *9*(1), 29–44.

Erkuş Demir, S., & Akgün, R. (2026). Deprem sonrasında göç eden kadınların psikososyal durumları üzerine bir analiz. *Uluslararası Sosyal Bilimler Akademi Dergisi*, *21*, 83–111. [CrossRef]

Ertaş, Y. D., Gümüşgül, O., Özdilek, Ç., & Erkut, S. (2026). Rekreasyonel etkinlik motivasyonu ile mental iyi oluş arasındaki ilişkide mutluluk korkusunun aracı ve düzenleyici rolü. *Sportive*, *9*(1), 16–32.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. [CrossRef] [PubMed]

Ferris, A. L., Hollenbaugh, E. E., & Sommer, P. A. (2021). Applying the uses and gratifications model to examine consequences of social media addiction. *Social Media+ Society*, *7*(2), 20563051211019003. [CrossRef]

Footitt, T., Gourdouros, M., Poulus, D. R., Colder Carras, M., Zarate, D., Schivinski, B., & Stavropoulos, V. (2025). Online flow experience: The contribution of distinct depressive profiles. *Canadian Journal of Behavioural Science/Revue Canadienne des Sciences du Comportement*, *57*(4), 298. [CrossRef]

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. [CrossRef]

Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: A comparison of four procedures. *Internet Research*, *29*(3), 430–447. [CrossRef]

Freire, T., Pereira, T., & Vieira, D. (2026). Youth Leisure during the Covid-19 Pandemic and Relations with Mental Health: A Systematic Review. *Journal of Child and Family Studies*, *35*, 613–626. [CrossRef]

Genç, N., & Yılmaz, G. (2024). Deprem sonrası rehabilitasyon sürecinde geçici rekreasyon alanlarının önemi. *International Journal of Holistic Health, Sports and Recreation*, *3*(1), 17–38. [CrossRef]

George, D., & Mallery, P. (2019). *IBM SPSS statistics 26 step by step: A simple guide and reference*. Routledge.

Ghani, J. A., & Deshpande, S. P. (1994). Task characteristics and the experience of optimal flow in human—Computer interaction. *The Journal of Psychology*, *128*(4), 381–391. [CrossRef]

Gong, Z., Wang, L., & Wang, H. (2021). Perceived stress and internet addiction among Chinese college students: Mediating effect of procrastination and moderating effect of flow. *Frontiers in Psychology*, *12*, 632461. [CrossRef] [PubMed]

Gürbüz, S. (2021). *Aracı ve düzenleyici etki analizleri*. Seçkin Yayıncılık.

Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, *54*, 170–179. [CrossRef]

Hancock, J. T., Liu, S. X., Luo, M., & Mieczkowski, H. (2022). Social media and psychological well-being. In S. C. Matz (Ed.), *The psychology of technology: Social science research in the age of Big Data* (pp. 195–238). American Psychological Association. [CrossRef]

Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Hayes, A. F., Montoya, A. K., & Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modelling. *Australasian Marketing Journal (AMJ)*, *25*(1), 76–81. [CrossRef]

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. [CrossRef]

Hoffman, D. L., & Novak, T. P. (2009). Flow online: Lessons learned and future prospects. *Journal of İnteractive Marketing*, *23*(1), 23–34. [CrossRef]

Igolkina, A. A., & Meshcheryakov, G. (2020). semopy: A Python package for structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, *27*(6), 952–963. [CrossRef]

Iwasaki, Y. (2003). The impact of leisure coping beliefs and strategies on adaptive outcomes. *Leisure Studies*, *22*(2), 93–108. [CrossRef]

Kara, F. M., & Karaca, G. (2026). Leisure satisfaction as a mediator of the relationship between recreational area preferences and flow experiences. *Acta Kinesiologica*, *20*(1), 26–32. [CrossRef]

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *Public Opinion Quarterly*, *37*(4), 509–523. [CrossRef]

Kaur, P., Dhir, A., Chen, S., & Rajala, R. (2016). Flow in context: Development and validation of the flow experience instrument for social networking. *Computers in Human Behavior*, *59*, 358–367. [CrossRef]

Kuykendall, L., Tay, L., & Ng, V. (2015). Leisure engagement and subjective well-being: A meta-analysis. *Psychological Bulletin*, *141*(2), 364–403. [CrossRef] [PubMed]

Lee, H., Kim, J., & Bae, I. (2019). A research on the mediating role of flow experience between involvement and satisfaction: Focus on leisure satisfaction for university students. *International Journal of Recent Technology and Engineering*, *8*(2S6), 27–30. [CrossRef]

Luo, M., & Hancock, J. T. (2020). Self-disclosure and social media: Motivations, mechanisms and psychological well-being. *Current Opinion in Psychology*, *31*, 110–115. [CrossRef] [PubMed]

Madianou, M. (2015). Digital inequality and second-order disasters: Social media in the Typhoon Haiyan recovery. *Social Media + Society*, *1*(2), 1–11. [CrossRef]

Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior, and Social Networking*, *16*(10), 721–727. [CrossRef] [PubMed]

Newman, D. B., Tay, L., & Diener, E. (2014). Leisure and subjective well-being: A model of psychological mechanisms as mediating factors. *Journal of Happiness Studies*, *15*, 555–578. [CrossRef]

Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour*, *3*(2), 173–182. [CrossRef] [PubMed]

Özdemir, N., & Koçakulak, N. (2026). From screen to field: The impact of digital sports participation on leisure time satisfaction. *BMC Sports Science, Medicine and Rehabilitation*, *18*, 182. [CrossRef] [PubMed]

Özmaya, E., Erkoç, B. H., & Uzun, S. (2026). Kahramanmaraş depremi sonrası gelecek kaygıları, psikolojik iyilikleri ve yaşam doyumlarının tespit edilmesi için türk üniversite gençleri üzerine nicel bir araştırma. *Karamanoğlu Mehmetbey Üniversitesi Sosyal Ve Ekonomik Araştırmalar Dergisi*, *28*(51), 149–164. [CrossRef]

Patton, M. Q. (2014). *Qualitative research & evaluation methods* (4th ed.). Sage Publications.

Peifer, C., Syrek, C., Ostwald, V., Schuh, E., & Antoni, C. H. (2020). Thieves of Flow: How Unfinished Tasks at Work are Related to Flow Experience and Wellbeing: C. Peifer et al. *Journal of Happiness Studies*, *21*(5), 1641–1660. [CrossRef]

Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C., & Yang, J. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. *Annual Review of Organizational Psychology and Organizational Behavior*, *11*(1), 17–61. [CrossRef]

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891. [CrossRef] [PubMed]

Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, *75*(5), 631. [CrossRef] [PubMed]

Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of General Psychology*, *14*(2), 154–166. [CrossRef]

Reinecke, L., & Hofmann, W. (2016). Slacking off or winding down? An experience sampling study on the drivers and consequences of media use for recovery versus procrastination. *Human Communication Research*, *42*(3), 441–461. [CrossRef]

Reinecke, L., & Oliver, M. B. (2016). *The Routledge handbook of media use and well-being*. Routledge.
Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three perspectives: Examining post hoc statistical techniques for detection and correction of common method variance. *Organizational Research Methods*, *12*(4), 762–800. [CrossRef]
Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass Communication & Society*, *3*(1), 3–37. [CrossRef] [PubMed]
Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
Ryan, R. M., & Deci, E. L. (2024). Self-determination theory. In *Encyclopedia of quality of life and well-being research* (pp. 6229–6235). Springer International Publishing.
Ryan, R. M., & Rigby, C. S. (2020). Motivational foundations of game-based learning. In J. L. Plass, R. E. Mayer, & B. D. Homer (Eds.), *Handbook of game-based learning* (pp. 153–176). MIT Press.
Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*, *69*, 371–380. [CrossRef]
Shen, X., MacDonald, M., Logan, S. W., Parkinson, C., Gorrell, L., & Hatfield, B. E. (2022). Leisure engagement during COVID-19 and its association with mental health and wellbeing in US adults. *International Journal of Environmental Research and Public Health*, *19*(3), 1081. [CrossRef] [PubMed]
Teng, C. I. (2018). Managing gamer relationships to enhance online gamer loyalty: The perspectives of social capital theory and self-perception theory. *Computers in Human Behavior*, *79*, 59–67. [CrossRef]
Toktaş, S., & Servi, T. (2026). Investigation of trauma levels of sports science faculty students following the February 6th earthquakes: A case study of Adıyaman and Kahramanmaraş provinces: Investigation of trauma levels of sports science Faculty Students Following the Earthquakes. *Anatolia Sport Research*, *7*(1), 97–105. [CrossRef]
Trenberth, L., & Dewe, P. (2002). The importance of leisure as a means of coping with work related stress: An exploratory study. *Counselling Psychology Quarterly*, *15*(1), 59–72. [CrossRef]
Turhan, F. H., & Tutar, Ö. F. (2023). Digital leisure time tendency scale: Validity and reliability study. *Journal of Education and Recreation Patterns*, *4*(2), 467–478. [CrossRef]
United Nations. (2006). *Convention on the rights of persons with disabilities*. United Nations.
Valkenburg, P. M., Meier, A., & Beyens, I. (2022). Social media use and its impact on adolescent mental health: An umbrella review of the evidence. *Current Opinion in Psychology*, *44*, 58–68. [CrossRef] [PubMed]
Valkenburg, P. M., & Peter, J. (2013). The differential susceptibility to media effects model. *Journal of Communication*, *63*(2), 221–243. [CrossRef]
van Dijk, J. (2020). *The digital divide*. Polity Press.
Vorderer, P., Hefner, D., Reinecke, L., & Klimmt, C. (Eds.). (2017). *Permanently online, permanently connected*. Routledge, Taylor & Francis Group.
Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating mental health of US college students during the COVID-19 pandemic: Cross-sectional survey study. *Journal of Medical Internet Research*, *22*(9), e22817. [CrossRef] [PubMed]
Webster, J., Trevino, L. K., & Ryan, L. (1993). The dimensionality and correlates of flow in human-computer interactions. *Computers in Human Behavior*, *9*(4), 411–426. [CrossRef]
Yao, S., Xie, L., & Chen, Y. (2023). Effect of active social media use on flow experience: Mediating role of academic self-efficacy. *Education and Information Technologies*, *28*(5), 5833–5848. [CrossRef]
Yılmaz, O., & Çetinkaya, B. (2024). Deprem sonrası genç yetişkinlerin gelecek beklentileri ve rekreatif spora katılım motivasyonları üzerine bir araştırma. *Ulusal Spor Bilimleri Dergisi*, *8*(1), 16–27. [CrossRef]
Yılmaz, O., & Dertli, Ş. (2025). Spor ve rekreatif etkinliklerin psikolojik dayanıklılık üzerine toplumsal yansımaları: Bir SWOT analizi. *Sportive*, *8*(2), 209–238. [CrossRef]
Yılmaz, S., Güngör, N. B., & Kurtipek, S. (2025). Boş zaman yoluyla stresle başa çıkmanın mutluluğa etkisİ. *Beden Eğitimi ve Spor Bilimleri Dergisi*, *19*(3), 454–474. [CrossRef]
Yu, G. B., & Kim, N. (2021). The effects of leisure life satisfaction on subjective wellbeing under the COVID-19 pandemic: The mediating role of stress relief. *Sustainability*, *13*(23), 13225. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.