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CONTEXTUAL TECHNOSTRESS AND COPING-RELATED RESPONSES IN THE DIGITAL AGE: EVIDENCE FROM A HUNGARIAN SURVEY

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ABSTRACT

Technostress is an increasingly relevant consequence of everyday digitalisation, but its intensity may depend more on perceived technological demands than on device use itself. This study examines contextual technostress, technology-related attitudes, coping-related responses, and demographic differences using data from a Hungarian online survey. The principal analytical sample comprised 941 respondents with complete data on the main study variables, after excluding one case with an implausible age value. Contextual technostress was measured across home, travel, work, and education and showed good reliability (Cronbach's $\alpha = 0{,}806$). Technology-change pressure ($\alpha = 0{,}781$) and coping-related responses ($\alpha = 0{,}768$) were also analysed as composite measures. Hierarchical regression showed that technology-change pressure, social-media involvement, coping-related responses, coping deficit, and student status were significantly associated with contextual technostress in the fully adjusted model. The final model explained 22,5% of the variance, with technology-change pressure emerging as the strongest predictor. Device count, employment status, education, and age were not significant in the fully adjusted model. The findings indicate that contextual technostress is more closely associated with perceived adaptation pressure and coping-related experiences than with device count alone. Because the data are cross-sectional, the positive association between coping-related responses and technostress should be interpreted cautiously.

KEY WORDS

technostress, technology-change pressure, coping-related responses, coping deficit, digitalisation

CLASSIFICATION

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INTRODUCTION

Digital technologies have become integral to work, education, communication, mobility, and everyday life. Although they improve access, efficiency, and flexibility, they also require continuous connectivity, rapid information processing, and repeated adaptation to changing systems. These demands may generate psychological tension, uncertainty, overload, and difficulties in maintaining boundaries between different areas of life. Such adverse responses are commonly described as technostress. The concept refers to psychological, behavioural, and potentially physical strain associated with the use of information and communication technologies. Technostress may emerge when individuals feel unable to keep pace with technological change, experience excessive digital demands, perceive systems as complex or unreliable, or feel that constant connectivity intrudes into their personal lives [1-4]. In the present study, technostress is treated as perceived technology-related tension rather than as a clinical condition or as a synonym for general anxiety, fatigue, or occupational stress. Most previous studies have examined technostress in organisational and occupational settings. However, technology-related strain may also arise at home, during travel, in education, and in social communication. Its intensity may depend not only on digital exposure, but also on how technological demands are perceived and whether individuals believe that they have effective coping resources. Coping is central to understanding technostress because individuals differ in both their available responses and their perceived ability to manage technological demands. However, in cross-sectional research, greater coping activity may reflect a reaction to existing strain rather than an antecedent of lower technostress. The present study addresses three related limitations in the literature. First, it examines technostress across several everyday contexts rather than focusing exclusively on employment. Second, it distinguishes digital exposure from perceived technology-change pressure. Third, it separates coping-related responses from perceived coping deficit and examines both alongside demographic, employment, and student-status characteristics. Accordingly, this empirical article uses data from an anonymous online survey conducted in Hungary in 2022 and 2023 to examine contextual technostress at home, while travelling, at work, and in education. It investigates the joint role of technology-change pressure, online and social-media involvement, .coping-related responses, coping deficit, device use, age, education, employment status, and student status. The aim is to determine whether technology-related perceptions and coping-related experiences explain contextual technostress beyond demographic characteristics and device use.

THEORETICAL BACKGROUND

TECHNOSTRESS AND ITS PRINCIPAL DIMENSIONS

Technostress can be understood as strain arising when technological demands exceed an individual's perceived competence, control, or capacity to adapt [1-4]. Contemporary digitalisation may intensify this imbalance because digital systems change rapidly and extend simultaneously across occupational, educational, social, and domestic settings. The literature commonly distinguishes five major technostress creators: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. Techno-overload occurs when digital technologies increase the volume or pace of work and information processing. Techno-invasion refers to the erosion of boundaries between occupational, educational, and private life through continuous connectivity. Techno-complexity emerges when users perceive systems as difficult to understand or operate, while techno-insecurity reflects concerns that technological change may threaten the value of existing skills or occupational positions. Techno-uncertainty describes the repeated need to adapt to updates, new platforms, and changing procedures [1, 2, 7-9]. Related technological conditions may also contribute to strain.

Information overload can impair concentration and decision-making [4-6], while system errors, malfunction, data loss, and privacy concerns may reduce perceived control and increase uncertainty [8, 10, 18]. These related stressors should not be treated as identical to the five classical technostress creators, but they help explain how specific characteristics of digital environments become psychologically demanding.

TECHNOSTRESS ACROSS CONTEXTS AND POPULATION GROUPS

Technostress research has traditionally concentrated on employment because workplace technologies influence workload, job control, performance monitoring, productivity, and work-family boundaries [1, 2, 7, 12, 13]. However, technology-related strain is not restricted to paid work. It may also emerge at home, during travel, in educational environments, and through online social participation. This contextual perspective differs from measuring separate technostress creators: it focuses on where technology-related tension is experienced rather than on which specific creator produced it. The same technology may have different consequences across settings. A platform that improves coordination in one domain may become intrusive in another, while the use of the same devices across work, study, home, and social roles allows demands to spill over between contexts. Technostress may also vary according to age, education, gender, employment, and life situation, although previous findings are inconsistent. Age does not necessarily represent a simple deficit in digital competence: younger users may experience intensive connectivity and social-media demands, whereas older users may face greater adaptation pressure in unfamiliar or rapidly changing systems [14, 15]. Education and employment may similarly increase both digital competence and exposure to complex technological demands. Consequently, demographic categories should be interpreted as indicators of differing technological experiences rather than as direct causes of technostress [12-15].

TECHNOLOGY-CHANGE PRESSURE AND DIGITAL INVOLVEMENT

Digital exposure should be distinguished from the subjective appraisal of technological demands. The number of devices used may indicate the extent of technology use, but it does not show whether those devices are perceived as difficult, intrusive, or uncontrollable. Several familiar and reliable devices may cause little strain, whereas even limited exposure may be stressful when systems change frequently or users feel unable to keep pace. Technology-change pressure may reflect concerns about skill obsolescence and insufficient confidence in adapting to new systems [8, 9]. Online and social-media involvement may create additional demands through constant availability, fear of missing information, and reduced opportunities for psychological detachment. At the same time, digital platforms may provide information, social connection, and support, making their role potentially ambivalent rather than uniformly harmful [5, 7, 10]. Accordingly, social-media involvement is treated in this study as an exploratory indicator of digital engagement rather than as a validated measure of social-media-related technostress.

COPING-RELATED RESOURCES AND THE THEORETICAL MODEL

Coping refers to cognitive and behavioural efforts used to manage stressors and their consequences. Problem-focused strategies aim to modify the technological demand itself, for example by changing notification settings, reorganising digital workflows, improving skills, seeking technical assistance, or temporarily disengaging from technology [11, 16]. Emotion-focused strategies aim to regulate emotional responses through relaxation, distraction, social support, positive reinterpretation, or psychological boundary-setting.

The coping items used in the present study assess general responses to stressful situations rather than strategies designed specifically for technostress. They are therefore interpreted as general

coping-related responses that may be relevant to reactions to digital demands. Perceived control is central to both approaches. Technostress is likely to be stronger when individuals believe that they cannot influence digital demands or have no adequate response available. Conversely, technical support, social assistance, personal competence, and control over work-life boundaries may reduce helplessness and improve adaptation [11, 13, 16]. Nevertheless, coping-related responses should not automatically be expected to correlate negatively with technostress in cross-sectional data. Individuals experiencing stronger strain may engage in more coping precisely because they face greater demands. A positive association may therefore reflect reactive coping rather than an adverse effect of the strategy. By contrast, perceived coping deficit – the feeling that no adequate solution is available – more directly represents limited control and insufficient adaptive resources. The resulting framework distinguishes five components: contextual technostress as the outcome, device count as an indicator of digital exposure, technology-change pressure as subjective demand appraisal, coping-related responses as attempts to manage stress, and coping deficit as an indicator of the perceived insufficiency of available responses. These components provide the basis for the research questions and hypotheses presented in the following section.

RESEARCH GAP, RESEARCH QUESTIONS AND HYPOTHESES

RESEARCH GAP

Although technostress is well established in organisational research, less attention has been paid to technology-related tension across multiple everyday contexts. Existing studies also do not always distinguish the extent of digital exposure from the subjective pressure of adapting to technological change. Moreover, demographic characteristics, digital involvement, and coping-related responses are often examined separately rather than within a common analytical framework. The interpretation of coping is particularly complex in cross-sectional research. Greater coping activity may represent a response to existing strain rather than a factor that necessarily precedes or reduces technostress. It is therefore useful to distinguish active coping-related responses from perceived coping deficit, understood as the absence of an adequate response to stressful demands. The present study addresses these gaps by examining contextual technostress across home, travel, work, and education and by analysing technology-change pressure, digital involvement, device use, coping-related responses, and demographic characteristics jointly.

RESEARCH QUESTIONS

The study addresses two research questions:

RQ_1: How does technology-related tension vary across everyday contexts and across age and work-study groups?

RQ_2: Which demographic, technology-related, and coping-related factors are associated with contextual technostress when considered separately and jointly?

HYPOTHESES

Perceived adaptation pressure is expected to be positively associated with contextual technostress.

H_1: Greater technology-change pressure is positively associated with contextual technostress.

Perceived coping deficit indicates that available responses are considered insufficient for managing stressful demands.

H_2: Greater coping deficit is positively associated with contextual technostress.

Technology-related perceptions and coping-related experiences are expected to provide explanatory value beyond demographic characteristics and device use.

H_3: Technology-related and coping-related variables explain additional variance in contextual technostress beyond demographic characteristics, employment and student status, and smart-device use.

METHODOLOGY

RESEARCH DESIGN AND DATA COLLECTION

The study used a quantitative, cross-sectional survey design. Data were collected in Hungary in 2022 and 2023 through an online questionnaire. Participation was voluntary, and the survey was distributed through personal, educational, and online networks using convenience and snowball sampling, with particular emphasis on reaching younger respondents. The questionnaire was openly accessible and could be completed by anyone who received the link. Because the link could be forwarded freely, the number of individuals who received or viewed the invitation could not be determined; consequently, a conventional response rate could not be calculated. Before beginning the questionnaire, respondents were informed about the purpose of the study, the voluntary nature of participation, and their right to discontinue at any time. The questionnaire did not request names, contact details, or other directly identifying information, and responses were stored and analysed in aggregated form. The sampling procedure produced a heterogeneous but non-probability sample. The findings should therefore not be interpreted as representative of the Hungarian population. The cross-sectional and self-reported design also precludes causal inference.

SAMPLE

The original database contained 2 490 questionnaire responses. The analysis was restricted to respondents with complete data on all principal technostress, technology-attitude, and coping items, resulting in 942 eligible cases. One case with an implausible reported age of 100 years was excluded, yielding a principal analytical sample of 941 respondents. Analyses involving student status and the hierarchical regression were based on the subsets of respondents with valid data for all variables included in the respective procedures. The principal analytical sample had a mean age of 23,73 years (SD = 8,01; range 10-68) and included 485 men, 447 women, and nine respondents in another or unspecified gender category. A total of 367 respondents were employed and 574 were not employed. Student status was available for 895 respondents: 793 were currently studying and 102 were not. Among these respondents, 466 were students only, 327 were both employed and studying, and 102 were neither employed nor studying. No employed-only category was observed; consequently, employment and student status did not form a complete 2 × 2 factorial design.

MEASURES

The study did not administer a complete standardised technostress-creators instrument. Instead, it assessed technology-related tension across four everyday contexts and examined selected technology-related attitudes and general coping-related responses as associated factors. Technology-attitude and coping items were rated from 0 (“not characteristic at all”) to 3 (“highly characteristic”). Contextual technostress items were rated from 0 (“never”) to 4 (“always”).

- **Contextual technostress.** Four items assessed how frequently respondents experienced technology-related tension at home, while travelling, at work, and in education. The mean

of the four items was used as the contextual technostress score. The scale showed good internal consistency (Cronbach's α = 0,806).

- **Technology-change pressure.** Two items assessed whether technology was perceived as changing too rapidly and whether keeping up with new software and devices was considered difficult. The items were strongly correlated (r = 0,642) and showed acceptable internal consistency (Cronbach's α = 0,781). Their mean formed the technology-change pressure index.
- **Online attachment.** Two items assessed difficulty disengaging from the phone and discomfort when not being available online. Because internal consistency was modest (Cronbach's α = 0,583), the mean score was retained as an exploratory indicator.
- **Social-media involvement.** Two items assessed fear of missing important information and the perceived opportunity to maintain numerous social connections through social media. Internal consistency was modest (Cronbach's α = 0,558). The mean score was therefore treated as an exploratory indicator of digital engagement rather than as a validated measure of social-media-related technostress.
- **Smart-device use.** Respondents reported the number of smart devices they used regularly on a daily basis. The measure ranged from 0 to 8 and was interpreted as an indicator of the extent of digital exposure rather than perceived technological strain.
- **Coping-related responses.** Five items assessed attempts to remove the stressor, engage in calming activities, seek social support, perceive stressful situations as manageable, and positively reinterpret them. The items referred to general stressful situations rather than specifically to technostress. The scale showed acceptable internal consistency (Cronbach's α = 0,768), and the item mean was used as the coping-related response score.
- **Coping deficit.** One item assessed whether respondents felt that they lacked an adequate solution to stressful situations. It was analysed separately as a single-item indicator, with higher values indicating greater perceived coping insufficiency.

The demographic and status variables included age, gender, highest educational attainment, employment status, and current student status. Smart-device count was included as an indicator of digital exposure.

DATA PREPARATION AND STATISTICAL ANALYSIS

User-defined missing values were treated as missing. Composite scores were calculated only when all constituent items were valid. Each analysis was based on respondents with valid data for the variables included in that procedure. The analyses were conducted using IBM SPSS Statistics. Descriptive statistics and Cronbach's alpha coefficients were calculated for the principal study variables. Spearman rank correlations were used to examine bivariate associations because the original questionnaire items were ordinal and several composite variables departed from normality. Employment and student-status differences in contextual technostress were examined using Mann-Whitney U tests. Differences across the three observed work–study categories and four age groups were assessed using Kruskal-Wallis tests. Group means and mean ranks were reported to facilitate interpretation. Non-parametric inference was treated as primary when distributional or variance assumptions were violated. Hierarchical multiple regression was used to examine which factors remained associated with contextual technostress when considered jointly and whether technology-related and coping-related variables increased the explained variance beyond demographic characteristics and device use. Block 1 contained age, gender, educational attainment, employment status, student status, and smart-device count. Block 2 added technology-change pressure, online attachment, and social-media involvement. Block 3 added coping-related responses and coping deficit. The regression models were evaluated using R^2, adjusted R^2, changes in explained variance, unstandardised and standardised regression coefficients, 95% confidence intervals,

variance inflation factors, and the Durbin–Watson statistic. As a sensitivity analysis, the final regression model was repeated among respondents aged 18 years or older.

RESULTS

DESCRIPTIVE STATISTICS AND SCALE RELIABILITY

The principal analytical sample comprised 941 respondents. Their mean age was 23,73 years (SD = 8,01), and they reported using an average of 1,93 smart devices daily. The mean contextual technostress score was 1,07 on the 0-4 scale. Technology-related tension was highest at work (M = 1,19), followed by travel (M = 1,13), education (M = 1,02), and home (M = 0,93). The contextual technostress items showed good internal consistency. Technology-change pressure and coping-related responses also showed acceptable internal consistency. Online attachment and social-media involvement showed more modest reliability and were therefore interpreted as exploratory indices. Table 1 presents the descriptive statistics and reliability coefficients of the principal study variables.

Table 1. Descriptive statistics and reliability of the principal study variables. Online attachment and social-media involvement were interpreted as exploratory indices because of their modest internal consistency. Coping deficit was measured using a single item. M – mean, SD – standard deviation.

Variable	Range	N	M	SD	Cronbach's α
Contextual technostress	0-4	941	1,069	0,808	0,806
Technology-change pressure	0-3	941	1,139	0,915	0,781
Online attachment	0-3	941	0,876	0,705	0,583
Social-media involvement	0-3	941	0,790	0,704	0,558
Coping-related responses	0-3	941	1,528	0,765	0,768
Coping deficit	0-3	941	1,077	1,022	(Single item)
Number of smart devices	0-8	941	1,926	1,044	-
Age	10-68	941	23,732	8,011	-

BIVARIATE ASSOCIATIONS

Contextual technostress was most strongly associated with technology-change pressure, $\rho = 0{,}391$, $p < 0{,}001$. Positive associations were also found with coping deficit, $\rho = 0{,}274$, coping-related responses, $\rho = 0{,}214$, social-media involvement, $\rho = 0{,}193$, and online attachment, $\rho = 0{,}133$, all $p < 0{,}001$. Age showed a weak negative association with contextual technostress, $\rho = -0{,}132$, $p < 0{,}001$. By contrast, the number of smart devices used was not significantly associated with contextual technostress, $\rho = 0{,}043$, $p = 0{,}186$.

GROUP DIFFERENCES

Table 2 summarises the group differences in contextual technostress. Employment status was not associated with contextual technostress. Employed and non-employed respondents reported almost identical mean scores, and the effect size was negligible, $U = 104{,}816$, $p = 0{,}899$, $r \approx 0{,}004$. Student status was associated with contextual technostress. Respondents who were not currently studying reported higher technostress (M = 1,495) than respondents who were studying (M = 1,009), $U = 25{,}795.5$, $p < 0{,}001$, $r \approx 0{,}199$. This represented a small difference. Significant differences were observed across the three available work-study categories, $H(2) = 38{,}881$, $p < 0{,}001$, $\varepsilon^2 = 0{,}041$. Descriptively, respondents who were neither working nor studying had the highest mean rank, followed by respondents who were both working and studying and students who were not employed. Because pairwise comparisons were not conducted, the specific groups responsible for the overall difference could not be identified. Because no employed-only category was observed, employment and student status could not

be evaluated as a complete 2 × 2 factorial design. Contextual technostress also differed significantly across the four age groups, H(3) = 61,075, $p < 0{,}001$, $\varepsilon^2 = 0{,}062$. Respondents aged 23-29 years reported the lowest mean technostress score. Because the assumption of homogeneity of variance was violated, the Kruskal-Wallis result was treated as the primary evidence for the overall age-group difference.

Table 2. Group differences in contextual technostress. No employed-only category was observed; therefore, a complete 2 × 2 work-by-study interaction could not be estimated. Pairwise non-parametric comparisons between the three observed work-study groups were not conducted. The reported r values were calculated from the standardized Mann-Whitney Z statistics, while ε^2 represents the effect size for the Kruskal-Wallis tests.

Grouping variable	Group	N	M or Mean rank	Test	*p*	Effect size
Employment	Not employed	574	M = 1,069	U = 104,816	0,899	r ≈ 0,004
	Employed	367	M = 1,067			
Student status	Not studying	102	M = 1,495	U = 25,795	< 0,001	r ≈ 0,199
	Studying	793	M = 1,009			
Work-study status	Neither working nor studying	102	Mean rank = 591,60	H(2) = 38,881	< 0,001	$\varepsilon^2 = 0{,}041$
	Student only	466	Mean rank = 416,41			
	Working and studying	327	Mean rank = 448,22			
Age group	Under 18	68	M = 1,254	H(3) = 61,075	< 0,001	$\varepsilon^2 = 0{,}062$
	18-22	463	M = 1,184			
	23-29	305	M = 0,793			
	30 or older	105	M = 1,243			

HIERARCHICAL REGRESSION

Hierarchical multiple regression was used to examine the incremental explanatory contribution of demographic, technology-related, and coping-related variables. The first block contained age, gender, education, employment status, student status, and smart-device count. This model explained 6,6% of the variance in contextual technostress, $R^2 = 0{,}066$, adjusted $R^2 = 0{,}059$, $F(7, 886) = 8{,}976$, $p < 0{,}001$. Adding technology-change pressure, online attachment, and social-media involvement in the second block increased the explained variance by 12,6 percentage points, $\Delta R^2 = 0{,}126$, $p < 0{,}001$. The addition of coping-related responses and coping deficit in the third block produced a further increase of 3,3 percentage points, $\Delta R^2 = 0{,}033$, $p < 0{,}001$.

The final model explained 22,5% of the variance in contextual technostress, $R^2 = 0{,}225$, adjusted $R^2 = 0{,}214$, $F(12, 881) = 21{,}316$, $p < 0{,}001$. As shown in Table 3, technology-change pressure was the strongest predictor, $\beta = 0{,}281$, $p < 0{,}001$. Coping deficit, $\beta = 0{,}157$, $p < 0{,}001$, social-media involvement, $\beta = 0{,}110$, $p = 0{,}001$, current student status, $\beta = -0{,}110$, $p = 0{,}001$, and coping-related responses, $\beta = 0{,}086$, $p = 0{,}006$, were also significant predictors. The negative coefficient for current student status indicated lower contextual technostress among respondents who were studying after the other variables were controlled. The positive coefficient for coping-related responses should not be interpreted as evidence that coping increases technostress. Given the cross-sectional design, it may indicate that respondents experiencing greater strain engaged more frequently in coping-related activities. Age, gender, education, employment status, smart-device count, and online attachment were not significant in the fully adjusted model. All variance inflation factors were below 1,24, indicating no substantial multicollinearity. The Durbin-Watson statistic was 2,076, suggesting no meaningful residual autocorrelation.

Table 3. Hierarchical regression predicting contextual technostress (N = 894 complete cases. B – unstandardised regression coefficient; SE – standard error; β – standardised regression coefficient; CI – confidence interval. Model statistics: $R^2 = 0{,}225$; adjusted $R^2 = 0{,}214$; $F(12, 881) = 21{,}316$; $p < 0{,}001$).

Predictor	B	SE	β	*p*	95% CI for B
Age	0,004	0,004	0,032	0,324	[−0,004, 0,013]
Female	0,066	0,051	0,041	0,190	[−0,033, 0,166]
Other/unspecified gender	−0,408	0,275	−0,044	0,139	[−0,948, 0,133]
Education	−0,031	0,030	−0,034	0,304	[−0,090, 0,028]
Employed	0,088	0,054	0,052	0,100	[−0,017, 0,193]
Currently studying	−0,281	0,082	−0,110	0,001	[−0,442, −0,120]
Number of smart devices	0,012	0,024	0,015	0,622	[−0,035, 0,059]
Technology-change pressure	0,248	0,028	0,281	< 0,001	[0,193, 0,303]
Online attachment	0,049	0,038	0,041	0,204	[−0,026, 0,123]
Social-media involvement	0,127	0,038	0,110	0,001	[0,052, 0,201]
Coping-related responses	0,091	0,033	0,086	0,006	[0,026, 0,156]
Coping deficit	0,124	0,025	0,157	< 0,001	[0,075, 0,173]

SENSITIVITY ANALYSIS AND HYPOTHESIS EVALUATION

The sensitivity analysis restricted to respondents aged 18 years or older produced almost identical explanatory power, $R^2 = 0{,}228$, adjusted $R^2 = 0{,}217$, $F(12, 815) = 200{,}115$, $p < 0{,}001$, indicating that the overall model fit was not materially affected by the inclusion of respondents under 18. **H_1** was supported because technology-change pressure showed a significant positive association with contextual technostress. **H_2** was also supported, as greater coping deficit was associated with higher contextual technostress. Finally, **H_3** was supported because the addition of technology-related and coping-related variables significantly increased the explained variance beyond demographic characteristics, employment and student status, and smart-device use. The contextual and group differences addressed in **RQ_1** are reported descriptively and through the corresponding omnibus group comparisons.

DISCUSSION

The findings support an appraisal-based interpretation of technostress. Contextual technostress was more strongly associated with perceived difficulty in keeping pace with technological change than with the number of smart devices used. This pattern supports **H_1** and indicates that the extent of device use alone is insufficient to explain technology-related strain. Rather, the findings are consistent with the interpretation that contextual technostress is higher when technological demands are perceived as difficult to understand, control, or accommodate. This interpretation is consistent with research on techno-complexity and techno-uncertainty, which emphasises the role of perceived competence, control, and capacity to adapt [1-4, 8-9].

The findings also reinforce the value of examining technostress beyond occupational settings. Technology-related tension was reported at home, during travel, at work, and in education, although the workplace had the highest mean score. These results indicate that contextual technostress may extend across several life domains as the same devices and platforms are used for occupational, educational, social, and personal activities. This pattern is consistent with techno-invasion, whereby continuous connectivity weakens boundaries between life domains and reduces opportunities for psychological detachment [7]. However, employment status itself was not significantly associated with contextual technostress, either in the bivariate comparison or in the adjusted regression model. This suggests that specific working conditions, such as digital workload, autonomy, system complexity, availability expectations, and organisational support, may be more informative than employment status alone [12].

In relation to **RQ1**, contextual technostress differed significantly across age and work-study groups, although these patterns should not be interpreted as evidence of simple generational or employment effects. Respondents aged 23-29 years reported the lowest mean contextual technostress, suggesting a non-monotonic pattern across the predefined age groups. Age may therefore reflect a combination of digital experience, educational context, occupational transition, social-media involvement, and exposure to changing technologies rather than acting as a direct source of technostress. Similarly, current students reported lower contextual technostress after the other variables were controlled. Greater familiarity with digital learning environments may contribute to this pattern, but differences in daily routines, role demands, technology use, and exposure to particular systems may also be relevant [14, 15]. Because the sample contained no employed-only category within the work-study classification, interpretations of these group differences remain provisional.

The coping results emphasise the importance of perceived control. The single-item indicator of coping deficit was positively associated with contextual technostress in both the bivariate and multivariable analyses, supporting **H2**. Respondents who perceived that they lacked an adequate response to stressful situations reported greater technology-related strain. This finding is consistent with literature highlighting the importance of self-efficacy, technical assistance, social support, and control over digital boundaries [11, 13, 16].

Coping-related responses were also positively associated with contextual technostress. This result should not be interpreted as evidence that coping strategies increase strain. The cross-sectional design does not establish whether coping preceded or followed technostress. A plausible interpretation is that respondents experiencing greater strain mobilised coping responses more frequently. Coping activity and coping deficit may therefore coexist: individuals may attempt to remove stressors, seek support, calm themselves, or reinterpret stressful situations while still perceiving their available responses as insufficient. Longitudinal research is needed to determine whether these responses subsequently reduce technostress.

The exploratory social-media involvement indicator remained significant, whereas online attachment did not. Digital platforms may provide information and social connection while simultaneously increasing attentional demands, fear of missing important information, and expectations of continued availability [7, 10]. However, because both indicators were based on only two items and showed modest internal consistency, this difference should not be interpreted as evidence of a clearly defined underlying mechanism. The hierarchical regression supported **H3**. Demographic characteristics and smart-device use explained only a limited proportion of variance, whereas the addition of technology-change pressure, online and social-media involvement, and coping-related variables significantly improved the model. The technology-related block produced the larger increase in explained variance, while the coping-related block made a smaller but still significant additional contribution. The final model explained 22,5% of the variance in contextual technostress. Technology-change pressure was the strongest predictor, followed by coping deficit, while social-media involvement, student status, and coping-related responses made smaller independent contributions. These results support the distinction between device-based digital exposure and the subjective appraisal of technological demands.

In light of these findings and previous research, organisations and educational institutions may consider interventions that strengthen users' control, adaptability, and access to support rather than focusing primarily on reducing device ownership. Gradual implementation of new systems, clear instructions, accessible technical assistance, reduced platform proliferation, and explicit expectations concerning availability may help limit adaptation pressure. Individual-level practices, including notification management, temporary disengagement, social support, and positive reinterpretation, may also be useful [11, 16, 17]. These recommendations should

nevertheless be interpreted as implications derived from the present results and the wider literature, because the study did not directly evaluate specific organisational interventions. Technostress should not be treated solely as an individual responsibility; excessive digital workload, poorly designed systems, frequent software changes, and ambiguous availability expectations may also require organisational and technological responses.

Overall, the study contributes to the literature by distinguishing the extent of digital exposure from perceived technology-change pressure and coping-related responses from perceived coping deficit. This framework helps explain why individuals with similar levels of device use may experience different levels of contextual technostress.

CONCLUSIONS

This study examined contextual technostress as an experience associated with perceived technological demands, coping-related responses, and life situation. The findings indicate that contextual technostress was more strongly associated with the perceived difficulty of keeping pace with technological change than with the number of smart devices used. Social-media involvement and perceived coping deficit also made independent contributions, whereas employment status and smart-device count had limited explanatory value in the fully adjusted model. Technology-related tension was reported across occupational and non-occupational contexts, including home, travel, work, and education. Employment status alone therefore appears to provide only limited information about contextual technostress. Future research should examine whether more specific characteristics of digital environments, including workload, software-change frequency, perceived control, availability expectations, and access to support, provide additional explanatory value beyond employment status. A further contribution of the study is the distinction between coping-related activity and perceived coping deficit. The single-item indicator of coping deficit was consistently associated with higher contextual technostress. The positive association between coping-related responses and technostress, by contrast, may reflect the mobilisation of coping efforts in response to existing strain rather than an adverse effect of coping itself. Overall, the findings support an understanding of contextual technostress as a perceived imbalance between technological demands and the resources available to manage them.

LIMITATIONS AND FUTURE RESEARCH

The study has several limitations. First, convenience and snowball sampling produced a predominantly young sample with a high proportion of students. The findings should therefore not be interpreted as representative of the Hungarian population. The open-access recruitment procedure also resulted in the participation of respondents under 18 years of age. Although no directly identifying information was requested and the adult-only sensitivity analysis produced similar overall model fit, future studies including adolescents should apply age-specific recruitment and consent procedures. Second, the cross-sectional and self-reported design does not permit causal inference. In particular, the temporal direction of the association between coping-related responses and contextual technostress cannot be established. Coping activity may precede strain, follow it, or develop simultaneously with it. Third, the study did not use a complete standardised technostress-creators instrument. Contextual technostress was measured through reported technology-related tension across home, travel, work, and education. The findings should therefore be interpreted as evidence concerning context-specific technology-related strain rather than the full multidimensional technostress construct. Fourth, online attachment and social-media involvement were measured using short two-item indices with modest internal consistency, while coping deficit was assessed using a single item. These indicators should therefore be interpreted cautiously. Future studies should employ established

multi-item measures and examine their dimensional structure through confirmatory factor analysis. Fifth, all respondents answered the four contextual technostress items, although some participants may not have been exposed to workplace or educational technologies during the relevant period. Future questionnaires should include explicit not-applicable response options and analyse context-specific technostress only among respondents with relevant exposure. Sixth, the observed work–study categories did not form a complete factorial structure because no employed-only category was present. This limited the interpretation of employment and student-status differences. More balanced samples are needed to separate the roles of employment, education, and combined work–study participation. Future research should use longitudinal designs to examine whether technology-change pressure predicts subsequent technostress and whether coping-related responses reduce strain over time. More detailed occupational, educational, and technological variables should also be incorporated, including digital workload, software-change frequency, system usability, autonomy, organisational support, technical assistance, and expectations of constant availability.

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