Unveiling shadows: exploring the dark side of digital transformation in Abu Dhabi

Masood Badri
Department of Community Development, Abu Dhabi, United Arab Emirates and
Department of Business and Economics, United Arab Emirates University,
Al Ain, United Arab Emirates

Mugheer Alkhaili, Hamad Aldhaheri and Guang Yang
Department of Community Development, Abu Dhabi, United Arab Emirates

Muna Albahar
Department of Community Development, Abu Dhabi, United Arab Emirates and
Department of Humanities, United Arab Emirates University,
Al Ain, United Arab Emirates

Saad Yaageib
Department of Community Development, Abu Dhabi, United Arab Emirates, and

Asma Alrashdi
Department of Monitoring and Innovation, Abu Dhabi, United Arab Emirates and
Department of Community Development, Abu Dhabi, United Arab Emirates

Abstract

Purpose – This research aims to investigate the negative aspects of digital transformation (DT) impacting various segments of society in the Emirate of Abu Dhabi, one of the seven Emirates comprising the United Arab Emirates. Specifically, it focuses on perceptions of participants to well-being: social connections and activities, physical health, mental health, the impact on the younger generation, and security/cybercrime.

Design/methodology/approach – Using data from the 3rd Abu Dhabi Quality of Life Survey, which is an annual large-scale survey, this study employs analysis of variance and regression analysis to explore the associations between the perceived negative impact of DT and various well-being indicators.

Findings – The study reveals that the perceived negative impact of digital transformation on the younger generation is of the highest concern, followed by concerns about mental health and social relationships. Results also show significant variations among different demographic categories. Among the perceived negative impacts, mental health, social trust, and happiness emerge as the most affected well-being indicators.

Originality/value – The originality and value of this study lie in its large social survey sample of over 80,000 participants. The findings suggest that the negative effects of DT are not uniformly experienced across different segments of the population. The study highlights the need for further research on the adverse effects of DT and recommends that policymakers develop targeted strategies to address the specific needs of different community segments, particularly vulnerable groups. Additionally, it emphasizes the importance of adaptive policies for younger age groups to prepare them for a digital future.

Keywords Digital transformation, Well-being, Young generation, Negative impact, Abu Dhabi

Paper type Research paper
Introduction
The United Arab Emirates is a federation composed of seven states, with Abu Dhabi being the largest and the capital of the country. Over the past decade, Abu Dhabi has been strategically advancing its digital transformation initiatives to attract investments and establish itself as a prime digital hub conducive to business growth (Abu Dhabi Media Office, 2021). By developing a robust digital infrastructure, exemplified by the upcoming Amazon Web Services in the region, and enhancing government digital services through platforms like TAMM, Abu Dhabi is not only facilitating easier and more efficient business operations but also improving overall customer experience, with the aspiration of becoming an ecosystem with “effortless” government services (UAE Government, 2024). The combination of these initiatives fosters an environment that attracts new businesses and supports existing ones, reinforcing Abu Dhabi’s position as a leading center for innovation and digital excellence. However, the advent of such transformations holds significant implications for society.

The widespread adoption of digital technologies across all segments of society holds considerable significance, as people increasingly rely on digital technologies and tools in their daily work and life. Owoseni (2023) investigated the definition of digital transformation (hereafter referred to as DT), and found over 20 definitions in the literature. The ubiquity of the term and inconsistency among scholars in tackling this issue poses challenges to enriching the DT literature. However, the overall definition gleaned by the authors was, “DT is how people use digital technologies for DT, and in the process enhance important competencies such as productivity, creativity, innovation, processes operations, sales, communication and services.” (p. 80). This study is guided by this broad definition.

The impact of DT spans every aspect of our lives, encompassing personal, social, and economic domains, with the potential to either enhance or diminish people’s happiness. Especially with emerging technologies such as Large Language Models (LLMs) or Internet of Things (IoT) that catalyzes peoples’ digital lifestyle changes (Ahmad & Zulkifli, 2022).

The extant research has highlighted several noteworthy concerns related to DT, particularly regarding people’s well-being. The negative impact of DT on various aspects of well-being has been examined, including happiness (Tobgye & Dorji, 2022), family relationships and social connections (Williams & Merten, 2011), mental and emotional health (Limone & Toto, 2021), physical health (Lee, Jiang, Crocker, & Way, 2022), and risks and addiction (Castren, Mustonen, Hylkila, Mannikko, Kaariainen, & Raitasalo, 2022). Special attention has been paid to the impact on the younger generation (Badri, Alnuaimi, Al Rashedi, Yang, & Temsah, 2017; Cabeza-Ramirez, Munoz-Fernandez, & Santos-Roldan, 2021).

In the Emirate of Abu Dhabi of the United Arab Emirates, a study conducted by Badri et al. (2017) underscored children’s increasing reliance on social networking platforms for maintaining social connections and engaging with external environments. In another study by Badri, Alkhali, Aldhafer, Yang, Albahar, and Alrashdi (2023), the significant impact of the digital revolution on various aspects of the lives of Abu Dhabi’s residents, including personal communication, relationships, physical and mental health, and online activity, was emphasized. While a significant positive association between digital resources within society and individuals’ happiness was noted, concerns about the adverse effects of DT on emotions and behaviors were also revealed. Despite recognizing these impacts, it is worth emphasizing that the effects of digital technologies across society remain complex and not yet fully understood.

This study aims to further examine the negative impact of DT identified by Badri et al. (2023), which encompasses five major areas - social activities, physical health, mental health, the younger generation, and security/cybercrime issues, taking into account the likely differences between and among various community segments. Furthermore, the study also investigates the association between the perceived negative impact of DT and selected well-being indicators such as happiness, satisfaction with income, subjective health, mental
health, quality time spent with family, satisfaction with family life, satisfaction with social relationships, effectiveness of social media, and social trust. Thus, it involves the investigation of various facets of the impact of DT and provides a thorough examination of individual subjective experiences within the current dynamic digital landscape.

Review of literature

Impact of DT on society

The global literature on DT highlights its multifaceted impact on society, encompassing technological, social, institutional, and economic changes (Nadkarni & Prügl, 2020; Ng & Wakenshaw, 2017; OECD, 2019; Schneider & Kokshagina, 2021). While it has improved business efficiency, connectivity, and economic competitiveness (Rindfleisch, O’Hern, & Sachdev, 2017), concerns about its broader societal implications have emerged. DT, as a socio-technical process, could have disruptive impact that goes beyond technology, tools, and organizations (OECD, 2019). Several studies emphasize the disruptive nature of DT, affecting individuals and communities (Millar, Lockett, & Ladd, 2018; Schuelke-Leech, 2018). Therefore, more nuanced understanding of DT’s impact to optimize benefits and mitigate drawbacks is required (OECD, 2019; Tobgye & Dorji, 2022).

Digital communication and social relationships

Technology’s integration into social and family life affects communication patterns and social development. The Internet and its innovations have revolutionized societal interactions, replacing traditional social groups based on physical proximity with electronically processed information networks based on shared interests, values, or activities (Castells, 2013). As the result of this shift of redefined social organization and communication, there has been a challenge of balancing screen time with in-person interactions (Lafton, Holmardsottir, Kapella, Sisask, & Zinoveva, 2023).

Physical and mental health effects of digital usage

Firstly, overuse of digital platforms results in negative physical effects (Rudolf, Bickmann, Froböse, Tholl, Wechsler, & Grieben, 2020). Prolonged screen time and associated long periods of sedentary behavior are linked to poor health outcomes (Durmić et al., 2017) and risk factors for numerous chronic diseases (Bailey, Hewson, Champion, & Sayegh, 2019). Research further indicates that DT and home confinement during events like the COVID-19 pandemic significantly impact children’s health (Singh, Roy, Sinha, Parveen, Sharma, & Joshi, 2020; Xie, Xue, Zhou, Zhu, Liu, Zhang, & Song, 2020). Secondly, mental health disorders are likely to be influenced by the changes in daily social interactions, with social media platforms playing a significant role in today’s digital age. While responsible social media use can improve mental health outcomes by fostering community and maintaining relationships, excessive social media usage, especially among youth, can have negative effects, leading to feelings of isolation, anxiety, and depression (Bashir & Bhat, 2017; Ulvi, Karamicheh-Muratovic, Baghbanzadeh, Bashir, Smith, & Haque, 2022). Thirdly, digital devices and increased screen time have transformed family dynamics and leisure activities. While technology enables shared experiences and activities, excessive screens use diminishes real-life relationships and fosters addiction, thus creating risks for isolating family members as they become engrossed in screens.

Conflicting views on screen time and well-being

Nonetheless, it should be noted that there are conflicting findings in the literature on the effect of screen time on well-being. As indicated above, some studies have established a negative
The association between screen time and well-being (Twenge & Campbell, 2018). For example, Gunuc and Dogan show that adolescents spending time with their mothers have a higher level of perceived social support. However, some other studies found benefits with greater screen time, more frequent use of gadgets, or inconclusive evidence on relationships between screen time and well-being (Odgers, 2018). Thus, it appears that the dynamics of DT affect well-being including mental health and family relationships in two or more directions, but excessive screen time is highly likely to reduce the social dimension of well-being.

Social risks of DT
In addition, while digital technologies offer empowerment and opportunities, the extensive use of them also tends to result in or exacerbate “networked individualism” and other risks related to cyberbullying and harmful social comparisons (Naslund, Aschbrenner, Marsch, & Bartels, 2016; Teepe, Glase, & Reips, 2023). Therefore, recent studies emphasize the importance of trust in adopting digital technology (Arfi, Nasr, Kondrateva, & Hikkerova, 2021; Falkenreck & Wagner, 2017). As argued by Julsrud and Krogstad (2020) and Shareef, Dwivedi, Wright, Kumar, Sharma, and Rana (2021), DT reshapes existing trust dynamics and trust is vital for successful technology adoption. DT heightens data security concerns for businesses (Saeed, Altamimi, Alkayyal, Alshehri, & Alabbad, 2023) and introduces risks like cyberbullying and online safety concerns for individuals, especially for children and adolescents, necessitating parental guidance and supervision (Bohnert & Gracia, 2021). Parents have a crucial role to play in safeguarding and promoting responsible digital practices, serving as key gatekeepers in regulating children’s digital access and in balancing empowerment with risks (Hung, 2022; Dias et al., 2016). Parents must balance their children’s technology use, ensuring it benefits education and recreation while safeguarding against negative effects like excessive screen time, cyberbullying, or exposure to inappropriate content (Nikken, 2019).

DT in the Arab Gulf
While the previous sections highlighted findings from global literature, a closer look in the region reveals similar findings regarding the impact of DT on individuals. In the region, a study conducted by Shwedeh, Aburayya, and Mansour (2023) in the UAE revealed that organizational DT had a negative impact on employee performance due to resistance to change and overwhelming rapid changes. The study found that the introduction of new digital tools often creates skill gaps, leading to stress and decreased performance. An always-on work culture exacerbates stress and burnout, while increased digital monitoring raises privacy concerns, reducing trust and morale. Additionally, reliance on digital communication reduces essential face-to-face interactions, harming team cohesion and organizational culture. In a mixed-method study by Abokhodair, Abbar, Vieweg, and Mejova (2017) in the neighboring countries of Saudi Arabia and Qatar, it was indicated that increased use of digital platforms of social media was correlated with a significant decrease in the sense of privacy and additional social stress on individuals as they attempt to maintain their private and public personas online.

Theoretical framework
To guide the interpretation of results, this study employs the Buchi Digital Wellbeing Framework (Büchi, 2024), which promotes balanced and healthy interactions with digital technologies, addressing both individual (micro) and societal (macro) aspects. The variables included in this study partially cover the components of the framework, and they will be discussed accordingly. The framework is further described below.
On the individual level, it emphasizes managing screen time, taking regular breaks, and using technology mindfully to prevent digital fatigue. It advocates for periodic digital detoxes to reconnect with offline activities and reduce dependency on devices. Proper posture and ergonomic device use are also highlighted to prevent physical strain. Psychological and emotional health aspects include tools to monitor mental health, promoting positive social media interactions, and educating on digital literacy to combat misinformation and online harassment.

On the societal level, the framework promotes digital citizenship, encouraging responsible and ethical online behavior. It advocates for equal access to digital technologies, ensuring no one is left behind, and emphasizes the importance of digital rights and privacy. For organizations and institutions, it supports workplace policies that promote work-life balance, integrates digital wellbeing into educational curricula, and backs public health initiatives that raise awareness about the impact of digital technologies on health.

The framework also calls for government policies that protect digital rights and promote healthy digital environments, and for industry standards that prioritize user wellbeing through user-friendly interfaces and transparent data usage. Overall, it recognizes the importance of both individual habits and broader societal influences in fostering a healthy digital ecosystem.

Methods and design

The survey and items

This study drew data from the Abu Dhabi Quality of Life (QoL) social survey that recorded 82,781 responses from all the regions of Abu Dhabi in its 3rd cycle. Since 2019, the QoL has been sponsored and conducted annually by the Department of Community Development in the Emirate of Abu Dhabi. The QoL-3 was conducted online from January to June 2022 and targeted residents aged 15 and older throughout Abu Dhabi. Ethical clearance was obtained from the Department of Community Development and the Statistic Center Abu Dhabi. The survey was distributed to individuals listed in various databases managed by governmental entities, community groups, and private organizations. The distribution channels included SMS and email. Efforts were made to prevent duplicate entries and ballot box stuffing.

The survey covered various well-being dimensions, including housing, income, job/work, health, social relationships, community cohesion, subjective well-being, and digital well-being. Specifically, respondents were asked to rate the extent of their concerns over the negative influence of DT on social activity, physical health, mental health, the young generation, and security/cybercrime. For each question, the scale ranged from 1 (not much at all) to 5 (to a large extent). These are the target variables to be explored in this research.

Based on the literature, we also identified a group of items to examine their association with the dependent variables (The five negative impacts of DT). These well-being indicators and their measurement scales are the following:

1. Social trust: “Generally speaking, do you agree that most people can be trusted?”, measured on a 5-point Likert scale from “strongly disagree” to “strongly agree”.

2. Satisfaction with income: “How satisfied are you with your household income?”, measured on a 5-point Likert scale from “strongly disagree” to “strongly agree”.

3. Mental health: “During the past four weeks, how much of a problem did you have with the following - depression, anxiety, remembering, sleeping, fear, loneliness, boredom?”, measured on a 5-point Likert scale from “not at all” to “a great extent”. This is a composite variable of the sum of the responses. The Cronbach’s reliability was 0.913.
DTS

(4) Subjective health: “In general, how do you personally assess your current health status?” measured on a 5-point Likert scale from “poor” to “excellent”.

(5) Effectiveness of social media: “How do you rate social media and social networking as being effective channels of social interaction?” measured on a 5-point Likert scale from “not much at all” to “a large extent”.

(6) Quality time spent with family: “How would you describe the amount of quality time you spend with your family?” measured on a 5-point Likert scale from “a very short amount” to “a large amount”.

(7) Satisfaction with family life: “To what extent do you agree with this statement - In general, I am satisfied with my family life”, measured on a 5-point Likert scale from “strongly disagree” to “strongly agree”.

(8) Satisfaction with social relationships: “To what extent do you agree with this statement - In general, I am satisfied with my relationships with other people I know (including acquaintances, friends, workmates, and neighbors)”, measured on a 5-point Likert scale from “strongly disagree” to “strongly agree”.

(9) Happiness: “How would you describe your average level of happiness as an Abu Dhabi resident?”, measured on a 0–10 scale from “extremely unhappy” to “extremely happy”.

(10) The negative impact of DT was operationalized through the item: To what extent are the following areas a major concern because of DT?

- Negative impact on social activity (1 = not much at all, 5 = to a large extent)
- Negative impact on physical health and activity (1 = not much at all, 5 = to a large extent)
  - Negative impact on mental health (1 = not much at all, 5 = to a large extent)
- Negative impact on the young generation (1 = not much at all, 5 = to a large extent)
- Increased Security issues/cyber crime (1 = not much at all, 5 = to a large extent)

Analysis methods
Scales were standardized before data were analyzed, in order to make the data more accountable for computational aspects and interpretations (Langenberg, 2006). Pre-analysis, using correlation and multiple regression, was performed to understand the magnitude and direction of individual relationships between the various factors used in the study.

To explore the negative effects of DT on community segments that differ by age, gender, education, and marital status, the analysis of variance (ANOVA) was used to compare the means of multiple groups or segments within a community simultaneously. It helps determine if there are significant differences in the negative effects experienced by these various segments. To test the normality of the data related to the means of the five aspects of negative impact of DT, the skewness of kurtosis was used. As a general guideline, the value for asymmetry and kurtosis between $-1$ and $+1$ is considered excellent and between $-2$ and $+2$ is acceptable to prove normal univariate distribution (Hair, Hult, Ringle, & Sarstedt, 2022).

Regression analyses were performed to investigate the effects of negative impacts of DT on selected well-being indicators. Regression analysis provides coefficients that quantify the
strength and direction of the relationships, controlling for confounding variables. These coefficients could help assess how much change in well-being indicators could be attributed to changes in the perception of negative impact of DT.

**Results**

Table 1 shows the profile of survey participants. Males and females are almost equally represented in the sample, and the same applies to the distribution by nationality, i.e. Emiratis and non-Emiratis. About 73% of the participants are married, with 61% holding a bachelor’s degree and 26% below a college degree. Age-wise, the largest age cohort is the 36–45 age group, accounting for 33%, followed by the 26–35 group (28%). Individuals were found to spend approximately 5.7 hours online each day. The largest percentage of respondents spends around 3–4 hours online daily (28%) and a substantial percentage of respondents (13%) spend more than 11 hours online.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>40,047</td>
<td>51.06%</td>
</tr>
<tr>
<td>Female</td>
<td>38,389</td>
<td>48.94%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>54,091</td>
<td>73.07%</td>
</tr>
<tr>
<td>Single</td>
<td>14,074</td>
<td>19.01%</td>
</tr>
<tr>
<td>Divorced</td>
<td>3,282</td>
<td>4.43%</td>
</tr>
<tr>
<td>Separated</td>
<td>629</td>
<td>0.85%</td>
</tr>
<tr>
<td>Widow/widower</td>
<td>1,947</td>
<td>2.63%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Number</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Lower than bachelor</td>
<td>21,507</td>
<td>25.98%</td>
</tr>
<tr>
<td>Bachelor</td>
<td>50,172</td>
<td>60.61%</td>
</tr>
<tr>
<td>Graduate</td>
<td>11,102</td>
<td>13.41%</td>
</tr>
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<table>
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<tr>
<th>Nationality</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emirati</td>
<td>39,376</td>
<td>50.21%</td>
</tr>
<tr>
<td>Non-Emirati</td>
<td>39,053</td>
<td>49.79%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percent</th>
</tr>
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<tbody>
<tr>
<td>9–18</td>
<td>7,956</td>
<td>9.61%</td>
</tr>
<tr>
<td>19–25</td>
<td>3,230</td>
<td>3.90%</td>
</tr>
<tr>
<td>26–35</td>
<td>23,455</td>
<td>28.34%</td>
</tr>
<tr>
<td>36–45</td>
<td>27,173</td>
<td>32.83%</td>
</tr>
<tr>
<td>46–55</td>
<td>12,361</td>
<td>14.94%</td>
</tr>
<tr>
<td>56+</td>
<td>8,586</td>
<td>10.37%</td>
</tr>
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<table>
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<tr>
<th>Hours online</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 hours</td>
<td>1,710</td>
<td>3.74%</td>
</tr>
<tr>
<td>1–2 hours</td>
<td>8,769</td>
<td>19.19%</td>
</tr>
<tr>
<td>3–4 hours</td>
<td>12,817</td>
<td>28.05%</td>
</tr>
<tr>
<td>5–6 hours</td>
<td>8,300</td>
<td>18.17%</td>
</tr>
<tr>
<td>7–8 hours</td>
<td>4,660</td>
<td>10.20%</td>
</tr>
<tr>
<td>9–10</td>
<td>3,628</td>
<td>7.94%</td>
</tr>
<tr>
<td>11+</td>
<td>5,804</td>
<td>12.70%</td>
</tr>
</tbody>
</table>

**Source(s):** Table by authors

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Table 1. Profile of survey respondents
Table 2 contains the results of the test of normality of the data. Both the skewness and kurtosis statistics are within the acceptable range. Looking at the means of negative impact, in general, survey respondents were more concerned about the negative impact on the young generation, security/cybercrime, and physical health. The perceived impact on mental challenges and social activity registered the lowest means.

The ANOVA tests mainly examine the differences among the respondents in terms of their demographic characteristics of their views on the extent of negative impact of DT on those five aspects. Table 3 shows the means, $f$-values, and significance of the differences between males and females. The results indicate that females show significantly higher concerns over all the five aspects of the negative impact of DT, particularly regarding the negative impact on the young generation and on security/cybercrime. In general, male respondents agree with females on those negative impacts.

The differences between and among groups of different marital status are also significant (Table 4). In general, the divorced reported the highest concerns over the negative impact on the young generation and on security/cybercrime, with a means of 3.429 and 3.189 respectively. The widows perceived the lowest extent of negative impact of all five aspects under investigation. The singles appeared to be more concerned about the detrimental effect of DT on mental health. The separated, on the other hand, recorded their highest concern over the negative impact on social activity.
Table 5 shows the ANOVA results by respondents’ education attainment. The group of the lowest education attainment recorded the lowest means on all five aspects of the impact of DT, while those with a graduate degree (master’s or doctorate) recorded the highest means. The differences between the groups of education attainment are most significantly exhibited on the ratings of the negative impact on young generations, security/cybercrime, and physical health, with F-scores of 422.094, 362.517, and 197.896 respectively.

The differences among the respondents by age group in their perceived extent of negative impact of DT are presented in Table 6. Again, the most significant difference is observed on the impact on the younger generation. The youngest age cohort provided the highest level of concern over the negative impact on mental health, while the middle aged (46–55 and 36–45) were more concerned about the impact on the younger generation.

Table 7 compares the results by nationality. On all the five aspects of negative impact, Emiratis record higher means. The most significant differences between Emiratis and non-Emiratis are registered on the impact on security/cybercrime and the young generation (F-values of 303.331 and 233.975 respectively). The negative impact on social activity is of the least concern to both Emiratis and non-Emiratis.

Table 8 shows the results of ANOVA considering daily hours spent online. Respondents who spent longer time online were more likely to show higher level of concerns about the negative impact of DT.

<table>
<thead>
<tr>
<th>Negative impact on</th>
<th>Below college</th>
<th>Bachelor</th>
<th>Graduate</th>
<th>F-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social activity</td>
<td>2.685</td>
<td>2.970</td>
<td>2.986</td>
<td>66.227</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical health</td>
<td>2.719</td>
<td>3.219</td>
<td>3.254</td>
<td>197.896</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>2.613</td>
<td>3.048</td>
<td>3.112</td>
<td>149.526</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Young generation</td>
<td>2.829</td>
<td>3.571</td>
<td>3.651</td>
<td>422.094</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Security/cybercrime</td>
<td>2.637</td>
<td>3.306</td>
<td>3.398</td>
<td>362.517</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Source(s): Table by authors

<table>
<thead>
<tr>
<th>Negative impact on</th>
<th>18 or below</th>
<th>19–24</th>
<th>25–35</th>
<th>36–45</th>
<th>46–55</th>
<th>56+</th>
<th>F-value</th>
<th>Sig</th>
</tr>
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<tbody>
<tr>
<td>Social activity</td>
<td>2.785</td>
<td>2.772</td>
<td>2.944</td>
<td>2.883</td>
<td>2.863</td>
<td>2.811</td>
<td>15.768</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical health</td>
<td>3.041</td>
<td>2.978</td>
<td>3.126</td>
<td>3.109</td>
<td>3.083</td>
<td>2.906</td>
<td>31.540</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>3.013</td>
<td>2.968</td>
<td>2.999</td>
<td>2.970</td>
<td>2.863</td>
<td>2.727</td>
<td>47.130</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Young generation</td>
<td>3.280</td>
<td>3.197</td>
<td>3.353</td>
<td>3.445</td>
<td>3.452</td>
<td>3.181</td>
<td>48.710</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Security/cybercrime</td>
<td>3.133</td>
<td>3.077</td>
<td>3.163</td>
<td>3.197</td>
<td>3.159</td>
<td>2.911</td>
<td>46.504</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Source(s): Table by authors

<table>
<thead>
<tr>
<th>Negative impact on</th>
<th>Emirati</th>
<th>Non-Emirati</th>
<th>F-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social activity</td>
<td>2.942</td>
<td>2.826</td>
<td>98.899</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical health</td>
<td>3.148</td>
<td>3.008</td>
<td>136.318</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>3.002</td>
<td>2.862</td>
<td>130.286</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Young generation</td>
<td>3.469</td>
<td>3.277</td>
<td>233.975</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Security/cybercrime</td>
<td>3.249</td>
<td>3.033</td>
<td>303.331</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Source(s): Table by authors
To gain a more comprehensive understanding of the perceived negative impact of DT, we conducted a series of multiple regressions to explore its associations with some well-being indicators. In each regression, the negative impact was considered as the independent variable. As presented in Table 9, the perception of the negative impact of DT is significantly associated with all nine well-being indicators. Across the five aspects of impact, the most significant relationships are consistently with happiness, mental health, and social trust. In addition, the associations between the negative impact on mental health with satisfaction with family life and satisfaction with social relationships are also most significant, so is the association between the negative impacts on young generation with subjective health. Overall, higher ratings of the negative impact of DT are associated with lower social trust, lower happiness, as well as lower level of satisfaction with income, quality family time, family life, and social relationships. On the other hand, higher ratings of the negative impact are associated with higher level of mental health issues.

From another angle, the highest $t$-values that are associated with each of the nine well-being indicators are the following:

1. Social trust - negative effect on the young generation.
2. Satisfaction with income - negative effect on the young generation.
3. Mental health - negative impact on mental health.
4. Subjective health - negative effect on the young generation.
5. Effectiveness of social media - negative impact on social activity.
6. Quality of time spent with family - negative effect on the young generation.
7. Satisfaction with family life - negative impact on mental health.
8. Satisfaction with social relationships - negative impact on mental health.

The findings affirm the perceived negative impact of DT may affect individual’s well-being in different domains and of various magnitude.

**Discussion**

The preliminary investigation of the impact of DT has revealed that residents of Abu Dhabi are more concerned about its detrimental effect on the younger generation, on people’s mental health, and about those pressing social challenges stemming from DT, i.e. social isolation, trust, and security.
<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>On social activity</th>
<th>On physical health</th>
<th>On mental health</th>
<th>On young generation</th>
<th>On security/cybercrime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>t-value</td>
<td>Sig</td>
<td>Beta</td>
<td>t-value</td>
<td>Sig</td>
</tr>
<tr>
<td>Social trust</td>
<td>-0.088</td>
<td>-16.869</td>
<td>0.001</td>
<td>-0.102</td>
<td>-19.657</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-0.063</td>
<td>-8.531</td>
<td>0.001</td>
<td>-0.075</td>
<td>-10.113</td>
</tr>
<tr>
<td>Mental health</td>
<td>0.089</td>
<td>17.139</td>
<td>0.001</td>
<td>0.107</td>
<td>20.603</td>
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<td>Subjective health</td>
<td>-0.067</td>
<td>-12.967</td>
<td>0.001</td>
<td>-0.072</td>
<td>-13.824</td>
</tr>
<tr>
<td>Effectiveness of</td>
<td>0.108</td>
<td>19.830</td>
<td>0.001</td>
<td>0.094</td>
<td>18.724</td>
</tr>
<tr>
<td>social media</td>
<td>Quality time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spent with family</td>
<td>-0.074</td>
<td>-12.150</td>
<td>0.001</td>
<td>-0.076</td>
<td>-13.150</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-0.068</td>
<td>-11.921</td>
<td>0.001</td>
<td>-0.080</td>
<td>-14.008</td>
</tr>
<tr>
<td>with family life</td>
<td>-0.068</td>
<td>-12.908</td>
<td>0.001</td>
<td>-0.072</td>
<td>-13.877</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-0.068</td>
<td>-12.908</td>
<td>0.001</td>
<td>-0.072</td>
<td>-13.877</td>
</tr>
<tr>
<td>with social</td>
<td>-0.102</td>
<td>-19.778</td>
<td>0.001</td>
<td>-0.102</td>
<td>-19.778</td>
</tr>
<tr>
<td>relationships</td>
<td>Happiness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source(s): Table by authors
Presently, youth are increasingly immersed in the digital realm (Bohnert & Gracia, 2021; Durak, 2018), which offers novel avenues for communication and socialization. The findings of this present study are in agreement with numerous research that has shown that prolonged online activity is associated with heightened negative perceptions of DT (Afifi, Zamanzadeh, Harrison, & Acevedo Callejas, 2018), and that adolescents utilize the Internet and digital tools more frequently than adults and in a more diversified way (Badri et al., 2017; Casaló & Escario, 2018; Tzavela et al., 2015). While these digital tools and platforms hold inherent value, they may concurrently encroach upon real-life interactions or foster digital addiction, leading to adverse effects on mental health and social relationships (Khang, Kim, & Kim, 2013; Odaci & Cikrikci, 2014).

The perceived negative impact on youth also connects with the concerns over cyberbullying and online safety. This study highlights the significance of cybersecurity concerns across all segments of society in Abu Dhabi. The present digital landscape introduces challenges like data breaches, online safety, and cyberbullying (Saeed et al., 2023), to which children and adolescents are particularly vulnerable.

Aligned with the findings of international research that underscores the significant negative impact of excessive use of social media and mobile devices on youth (Twenge & Campbell, 2018), this study lends support to increasing parental concerns about children’s well-being in the digital age (Xie et al., 2020; Singh et al., 2020). Echoing the calls of other researchers (e.g. Dias et al., 2016; Hung, 2022), we underscore the importance of heightened parental attention and interaction with children, and advocate for social policymakers to prioritize the pivotal role that parents play in exercising flexible control over children’s access to and use of digital technologies.

Although the impact on physical health does not appear to be a primary concern in the context of Abu Dhabi, the significance of the impact of DT on physical health is established. This observation is echoed by other international research that highlights the emergence of these unforeseen and ignored challenges. There is firm evidence in the literature on the detrimental effects of prolonged screen time on health (Dumuid et al., 2017). Therefore, communities should be reminded of the often-underestimated side effects of DT on physical health outcomes.

This research further indicates that females consistently exhibit significantly greater concerns over DT. This is in line with recent studies suggesting that females harbor unique apprehensions regarding the risks associated with DT (Brookings, 2024). Other studies also suggest that females may express heightened fears regarding anticipated economic security, personal safety, and the implications of such changes in daily life practices associated with DT (Odaci & Cikrikci, 2014). Furthermore, the Abu Dhabi sample has seen that divorced individuals reported the highest mean scores regarding the negative impact of DT, corroborating assertions made by McDermott, Fowler, and Christakis (2013) regarding the impact of social networks on divorced individuals. Additionally, middle-aged individuals exhibited the highest concerns about the negative impact of DT, which may align with research suggesting that DT can bring about changes in life-course structures (Komp-Leukkunen, 2023). For the working-age population, developments of DT at workplaces could lead to adjustments in the duration of life phases in middle and old age, potentially affecting social inequalities and well-being (Komp-Leukkunen, 2023). Moreover, Emiratis demonstrated higher levels of concerns over DT than non-Emiratis, especially regarding the negative impact on the younger generation and on cybersecurity. These results are understandable given that Emiratis have extended families with children living together. The cyber challenges appeared to be particularly salient for Emiratis, as many businesses in Abu Dhabi are owned by Emiratis, though this aspect requires further investigation.
Taken together, there is the flip side of DT that increased isolation poses a significant detriment to individual's well-being. One of the key findings of this study is that taking a negative perspective towards the impact of DT may intensify the level of negativity people harbor concerning various dimensions of well-being. This negativity is notably reflected in people’s subjective well-being, social trust, mental health, as well as in various aspects of social connections.

**Theoretical contributions**

The findings reveal significant negative impacts of digital technology (DT) on various aspects of well-being, particularly among the young generation. Interpreting these findings through the lens of the Buchi Digital Wellbeing Framework provides useful insights on the interplay of individual habits (micro) and societal influences (macro) on digital wellbeing.

At the micro level, individual digital practices seem to have various detrimental outcomes. For instance, the negative impact on mental and subjective health could be linked to digital behaviors that induce stress or embarrassment, such as excessive social media use or encountering negative content online. The significant negative impact of DT on mental health aligns with the Buchi framework's emphasis on mental health monitoring and the need for tools to manage mental health in relation to digital use.

The negative effect of social trust on the young generation underscores the erosion of interpersonal relationships in a digitally saturated environment. Reduced social trust and decreased quality time with family suggest that digital practices may be diminishing face-to-face interactions, which are crucial for building trust and strong family bonds. Additionally, the negative effect on subjective health highlights the physical health consequences of excessive digital use, such as sedentary lifestyles. The Buchi framework indicates that potential factors contributing to this correlation are excessive screen time, not taking regular breaks, and unhealthy postures while using digital devices.

On the macro level, the framework points to broader societal impacts. The effectiveness of social media and the overall satisfaction with social relationships might be indicative of how online presence and consumption of digital media is reshaping social norms and expectations, potentially leading to less fulfilling social interactions. The negative impact of social media on social activity demonstrated in this study indicates that while social media facilitates virtual connections, it may detract from meaningful face-to-face interactions. This alteration in social dynamics emphasizes the macro factors of digital wellbeing contributing to the observed decrease in satisfaction with social relationships.

Another macro level factor elicited by the Buchi framework is the balance between family and personal lives. The significance of this component is demonstrated by the finding in this study that lower quality of time spent with family negatively affects the young generation’s mental health, which underscores the intrusive nature of digital devices in family life.

Finally, the finding that happiness is negatively impacted by concerns over security and cybercrime aligns with the Buchi framework’s emphasis on digital rights and privacy. Ensuring robust cybersecurity measures and educating individuals about protecting their personal information online can alleviate the anxiety associated with digital security threats, thereby contributing to overall happiness and wellbeing. The correlations found in this study adds further merit to the Buchi framework as a valid lens to understand the complex interplay of micro and macro factors when it comes to the impact of DT on individuals.
Conclusions
The findings of this research underscore significant challenges and adverse ramifications stemming from DT, as perceived by communities. In tandem with previous research, our findings pave the way for researchers and policymakers by highlighting the importance of studying DT alongside other well-being constructs. It is noteworthy to identify and analyze DT transformation as a complex undertaking with substantial benefits as well as threats to our way of life.

Policymakers should seek strategies to capitalize on the opportunities presented by DT while mitigating its associated risks. It is crucial to recognize that, in addition to its adverse effects on health, mental well-being, and social connections, individuals may also be vulnerable to risks such as misinformation and cyberbullying. Policymakers should also note that the negative effects of DT are not uniformly distributed across different segments of the community, particularly concerning variations in gender, age, marital status, and educational attainment.

It is important for policymakers, business leaders, and technology innovators to be more attuned to the fears and realities of DT’s impact on various segments of the community, particularly the younger generations. Acknowledging the significant impact of DT on adolescent development, a fundamental question for policymakers is how to center social policies on encouraging schools to adapt their systems and curricula to effectively engage the younger generation through more impactful methods, while keeping students’ well-being on guard. Policymakers are also encouraged to undertake a thorough reassessment of family-oriented guidelines to foster a sense of familial connection within the younger generations, emphasizing it as the primary route to a fulfilling life.

There are other aspects of the impact of DT, such as job displacement and the demand for alternative employment opportunities (Brookings, 2024), to be explored by future studies. Additionally, subsequent research endeavors could aim to construct a comprehensive path model to explore the direct and indirect associations between the negative impact of DT and other significant well-being indicators. Such an inquiry could yield valuable insights to assisting policymakers further in making proper policies and interventions.

Future directions
This study underscores the importance of investigating specific digital behaviors that contribute to negative outcomes and exploring potential moderating factors like personality traits or situational contexts. Such research would align with the digital well-being framework’s call for detailed, nuanced studies into the interplay between digital practices and well-being at both individual and societal levels. Future studies should extend these findings by conducting further analyses of how different demographics uniquely experience the adverse and beneficial aspects of DT. It is critical to delve into the variances in impact based on factors such as socio-economic status, geographic location, and cultural background, to develop a nuanced understanding of DT’s influence across diverse populations (e.g. expatriates).

Moreover, future research could benefit from longitudinal studies that track changes over time to better understand the long-term effects of DT on mental health and social dynamics. There is also a pressing need for empirical research that examines the efficacy of specific policy interventions designed to mitigate the negative consequences of DT. Additionally, the exploration of technological resilience—how individuals and communities adapt to and recover from the disruptions caused by digitalization—could offer valuable insights into creating more robust social systems.
References


**Corresponding author**
Masood Badri can be contacted at: masood.badri@addcd.gov.ae