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Traces of Technology: The Transformation of Single Individuals' Perceptions of Loneliness and Social Connections

Çağla Girgin[1]

[1] Assoc. Prof. Dr., Selcuk University Beysehir Ali Akkanat School of Applied Sciences Department of Social Work Konya , Türkiye

ORCID: 0000-0001-8440-6320
E-Mail:
caglagirgin@selcuk.edu.tr

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Abstract

This study aims to examine the impact of digital technologies on the perceptions of loneliness and social connections among single individuals aged 18-35. Data were collected through semi-structured interviews with 44 participants. Findings were categorized into five main themes: General Experience and Perceptions, Social Connections and Relationships, Loneliness and Digital Interaction, Advantages and Disadvantages of Digital Technologies, and Singlehood and Digital Experiences. Participants reported that digital technologies both strengthen and make social relationships more superficial. Social media provides short-term relief for loneliness, but it is insufficient in the long run. While digital platforms contribute to socialization, the lack of face-to-face interaction reduces emotional satisfaction. This study provides valuable insights into the dynamics between loneliness and social connections in the digital age. It is recommended to develop strategies in social work and psychology to utilize digital tools more effectively in addressing loneliness.

Keywords: *Digital technologies, perception of loneliness, social connections, singlehood, digital interaction.*

Öz

Bu araştırma, dijital teknolojilerin 18-35 yaş arasındaki bekâr bireylerin yalnızlık algıları ve sosyal bağlantıları üzerindeki etkilerini incelemeyi amaçlamaktadır. Çalışmada, 44 katılımcı ile gerçekleştirilen yarı yapılandırılmış görüşmeler yoluyla veri toplanmıştır. Bulgular, beş ana tema etrafında şekillenmiştir: Genel Deneyim ve Algılar, Sosyal Bağlantılar ve İlişkiler, Yalnızlık ve Dijital Etkileşim, Dijital Teknolojilerin Avantaj ve Dezavantajları, Bekârlık ve Dijital Deneyimler. Katılımcılar, dijital teknolojilerin sosyal ilişkileri hem güçlendirdiğini hem de yüzeysel hale getirdiğini belirtmiştir. Yalnızlık hissiyle başa çıkmada sosyal medyanın kısa vadeli çözümler sunduğu, ancak uzun vadede yetersiz kaldığı görülmüştür. Dijital platformların bireylerin sosyalleşmesine katkı sağlarken, yüz yüze iletişim eksikliğinin duygusal tatmini azalttığı belirlenmiştir. Bu çalışma, dijital çağda yalnızlık ve sosyal bağlantılar arasındaki dinamikleri anlamaya yönelik önemli bulgular sunmaktadır. Sosyal hizmet ve psikoloji alanlarında, yalnızlıkla başa çıkmada dijital araçların nasıl daha etkili kullanılabileceğine dair stratejilerin geliştirilmesi önerilmektedir.

Anahtar Kelimeler: *Dijital teknolojiler, yalnızlık algısı, sosyal bağlantılar, bekârlık, dijital etkileşim.*

Introduction

Despite its increasing prevalence in modern societies, singlehood continues to be perceived as a social shortcoming shaped by dominant cultural expectations (Tezcan, 2021). While industrialization and economic precarity have contributed to changing relationship patterns, growing individualism has also played a significant role in shifting life trajectories away from marriage (Erdoğan, 2019; Lehrer, 2006). The capitalist system further reinforces this orientation by idealizing autonomy and promoting consumption tied to single living (Kuperberg, 2014). These dynamics underscore the need to reconceptualize non-marital lifestyles as socially legitimate and personally fulfilling (Manning & Cohen, 2012).

In recent years, the impact of digital technologies on perceptions of loneliness and social experiences has garnered increasing scholarly attention. Although various studies have explored the interactions between loneliness and technology, research that holistically examines the multidimensional nature of this relationship remains insufficient. Ongoing debates regarding the potential of digital technologies to strengthen social connections and mitigate loneliness suggest that this relationship is highly variable, shaped by individual differences, contextual factors, and usage patterns. Consequently, there is a growing need for comprehensive analyses that delve into the dynamics of loneliness and technology, extending beyond statistical data to include theoretical and practical implications (Hughes et al., 2024; Barbosa Neves, et al., 2021; Site et al., 2022; Zheng et al., 2023; Lin, 2022).

Technological advancements have accelerated the transition of social interactions from offline to online environments, fundamentally transforming the ways individuals engage with one another. Social media platforms, video streaming services, and online communication tools facilitate instant connectivity, eliminating geographical barriers. Traditional communication methods have increasingly been supplemented or replaced by digital platforms. Friendships, romantic relationships, and professional connections are now predominantly established and maintained in digital spaces. While group chats and virtual communities provide mechanisms for social support, access to information has also been democratized. Digital media enables the dissemination of academic and political awareness, allowing individuals to gain deeper insights into societal issues and personalize their learning processes through online discussions and widely shared content (Liang, 2012; Knox, 2019; Redhead & Power, 2022).

However, digital connections come with both advantages and disadvantages. While digital platforms grant individuals access to information and social support networks, they may also exacerbate loneliness due to the decline of face-to-face interactions. The increasing shift of social relationships to online spaces may encourage individuals to form more superficial and transient connections. Therefore, the impact of digital interactions on social bonds varies depending on the context. To better understand the role of digital media in shaping individual and societal relationships, a comprehensive examination of this phenomenon is required (Kim & Zhu, 2020; Uzoka et al., 2024; Lewis, 2024; Pang & Zhang, 2024; Potter et al., 2022).

Single Individuals and Digital Platforms: The Expansion and Limitations of Social Networks

The widespread adoption of technology and digital platforms has profoundly transformed social interactions. Social networking sites, email, instant messaging, and online gaming have diversified communication methods, eliminating geographical barriers and facilitating relationship maintenance. Platforms such as Facebook have played a crucial role in expanding and reshaping social networks. However, the potential of these digital tools to strengthen, transform, or restrict social bonds raises significant questions (Ruben et al., 2021; Müller-Pérez et al., 2023; Armstrong-Carter & Telzer, 2021; Pang, 2021).

The increasing use of the internet has led individuals to spend more time with digital devices, sparking debates about the quality of social interactions. While digital platforms help individuals meet their social needs, they do not fully replace authentic friendships in the physical world. The prevalence of virtual interactions may lead to more superficial relationships and a growing sense of al-

ienation. Excessive time spent in digital communication can contribute to antisocial behaviors and detachment from one's physical surroundings (Sandhu & Trottier, 2023; Fineberg et al., 2022; Kaye et al., 2022; Jia et al., 2024).

Excessive dependence on digital communication can weaken individuals' ability to form meaningful connections, prioritizing virtual interactions over emotional bonds. This, in turn, may make it more challenging to develop deep and fulfilling relationships in the long term (Aronowicz, 2020; Li et al., 2022; Rast et al., 2021).

Single individuals, in particular, perceive digital platforms as a primary means of social interaction and are more attuned to digital trends. Smartphones serve as tools that both strengthen connections and reduce face-to-face interactions, thereby intensifying feelings of loneliness. Additionally, the spending habits of single individuals are noteworthy. With fewer financial obligations, they tend to allocate more resources to personal expenses and luxury consumption, which may sometimes conflict with societal norms. For instance, displaying an expensive car at an informal social event may highlight the disconnect between individual spending habits and social expectations (Gawer, 2021; Sin et al., 2021; Hennig-Thurau et al., 2023; Javornik et al., 2022; Yap et al., 2021; Quach et al., 2022; Gkeredakis et al., 2021; Jiang & Stylos, 2021).

Digital platforms influence not only social interactions but also romantic relationships. Technology has facilitated long-distance relationships by providing new communication opportunities. While it allows individuals to establish romantic connections beyond geographical constraints, uncertainties remain regarding the sustainability of these relationships. Despite the increasing use of digital platforms, the likelihood of single individuals finding romantic partners has not significantly increased. As traditional social boundaries are replaced by digital networks, the importance of communication and compatibility in long-distance relationships continues to grow (Gutzmann, 2018; Hosen, 2023; Ukorah, 2023; Huang & Kumarasinghe, 2024).

Coping Mechanisms for Loneliness in the Digital Age

Loneliness is one of the most significant psychosocial issues of modern society, addressed at both individual and societal levels. In academic literature, this phenomenon is interpreted as a consequence of the dissolution of traditional social systems, social exclusion, or the impact of digitalization. Today, loneliness is deeply intertwined with the digitalization process, which simultaneously strengthens social ties and increases isolation (Hughes et al., 2024; Ko et al., 2022; Weinstein et al., 2023; Taylor & Chen, 2024; Goodarzi et al., 2023; Bauman, 2024).

At the beginning of the 21st century, the internet was seen as a revolutionary development that transformed communication and information sharing. The widespread adoption of social media and smartphones has made individuals constantly connected to the digital world. However, this state of continuous connectivity has created a complex dynamic that both alleviates and deepens feelings of loneliness. As Sherry Turkle has emphasized, online interactions provide individuals with opportunities to explore their identities while simultaneously contributing to a deeper sense of loneliness. While digitalization offers individuals opportunities to strengthen their social ties, the decline in face-to-face interactions has led to the emergence of different forms of loneliness, creating a paradox (Golmohammadi, 2023; Stuart et al., 2022; Straughan & Bissell, 2022; Nguyen & Hargittai, 2023).

One of the groups most affected by this phenomenon is single individuals. As social structures change, the impact of loneliness on single individuals and their social connections has become increasingly visible. Loneliness highlights the challenges individuals face in forming, maintaining, and restructuring their social relationships, underscoring the critical role of social connections in emotional well-being. This study aims to provide a deeper understanding of the transformation of loneliness and social relationships within rapidly changing societal structures by examining the loneliness experiences of single individuals and how their social networks influence these feelings

(Adamczyk, 2016; Tietjen & Tirkkonen, 2023; Santini & Koyanagi, 2021; Kanbay et al., 2023).

While loneliness is an inevitable phenomenon, understanding the contradictions brought by the digital age and offering insights into how individuals can cope with this emotional experience is crucial for individual and societal well-being.

This research aims to examine the impact of digital technologies on individuals' perceptions of loneliness and social connections. In this context, the study will explore how digital platforms shape individuals' social relationships, the role they play in coping with loneliness, and the influence of demographic factors on these dynamics. The research sub-questions are structured as follows:

1. How do digital technologies and social media fit into individuals' daily lives, and how do they influence the perception of loneliness?
2. How do social relationships established through digital platforms shape individuals' social bonds, and how do they compare to face-to-face interactions?
3. What role do digital technologies play in coping with loneliness, and how do individuals utilize digital spaces when they feel lonely?
4. What advantages and disadvantages do digital technologies present in individuals' social lives, and how do they affect feelings of loneliness and isolation?
5. How do single individuals experience social connections through digital platforms, and what differences emerge compared to traditional methods?

Method

Research Design

This study adopts a qualitative research method to examine the impact of digital technologies on individuals' perceptions of loneliness and social connections. Qualitative research focuses on understanding social phenomena within their context by exploring individuals' experiences and perceptions (Yıldırım & Şimşek, 2013).

To gain an in-depth understanding of the effects of digital technologies on loneliness perception, thematic analysis was employed. Thematic analysis is a method that systematically identifies and interprets meaningful patterns and themes within data (Boyatzis, 1998; Braun & Clarke, 2012). Within this framework, the subjective perceptions and experiences of participants regarding the relationship between technology and loneliness were analyzed.

Study Group

Purposeful sampling methods, including maximum variation sampling and criterion sampling, were used to select participants. Maximum variation sampling was chosen to explore how different individuals experience the studied phenomenon and to identify commonalities (Merriam, 2013; Yıldırım & Şimşek, 2013). Accordingly, participants were selected to ensure diversity in age, occupation, and digital platform usage.

Criterion sampling is a method that includes individuals who meet specific pre-determined criteria (Patton, 2014). In this study, the criteria for participation included:

· Having actively used digital platforms for at least five years,
· Being single,
· Voluntarily agreeing to participate in the research.

Selecting individuals who have experienced the impact of digital technologies on social relationships and perceptions of loneliness was considered essential for generating relevant data for the study.

An analysis of the demographic data of the 44 participants revealed that their ages ranged from 18 to 35 years, with an average age of approximately 26. Regarding gender distribution, 60% of the participants were female, while 40% were male.

In terms of education level, 45% of participants were undergraduate graduates, 25% held a master's or doctoral degree, 20% had completed high school, and 10% had either an associate degree or primary education. Regarding employment status, 50% of participants were actively working, 30% were students, and 20% were unemployed.

Among the working participants, professions included teaching, engineering, healthcare, and freelance occupations.

Regarding monthly income distribution, 35% earned 7,500 TL or less, 40% had an income between 7,500-12,500 TL, and 25% earned 12,500 TL or more. Participants' place of residence showed that 55% lived in metropolitan areas, 30% in districts, 10% in small towns, and 5% in rural villages.

An analysis of their living arrangements showed that 50% lived with their nuclear family, 20% with their extended family, 15% with roommates, and 15% lived alone. Regarding the number of siblings, 45% had 1-3 siblings, 35% had 3-5 siblings, 15% had 5 or more siblings, and 5% were only children.

Participants' perceptions of family attitudes indicated that 40% described their families as "supportive", 35% as "involved", 20% as "democratic", and 5% as "indifferent." Regarding parental health status, 85% of participants had both parents alive, 10% had lost one parent, and 5% had lost both parents.

In terms of parental marital status, 90% reported that their parents were married, while 10% stated that their parents were divorced or separated. Regarding the quality of their parents' marriage, 70% described their relationship as "emotional and romantic", 20% as "a marriage maintained solely for the children", and 10% as "a broken marriage with minimal unity."

Participants' relationship statuses revealed that 55% were not currently in a relationship, while 45% were in a relationship. When asked about their preferred type of marriage in the future, 65% desired an emotional and romantic marriage, 25% preferred a pragmatic marriage, and 10% expressed a preference for an arranged marriage.

Development of the Data Collection Instrument and Data Collection Process

Before proceeding with the data collection process, ethical approval was obtained from the Ethics Committee of the Faculty of Education at Selçuk University (21.01.2025-E.923827). To gain an in-depth understanding of individuals' experiences with digital technologies and perceptions of loneliness, a semi-structured interview method was employed. This approach allows participants to express their perceptions and experiences through open-ended questions (McIntosh & Morse, 2015; Merriam, 2013).

The interview questions were developed by the researcher based on relevant literature and were shaped in alignment with the research problem. Before finalizing the interview form, feedback was obtained from two academic experts specializing in loneliness and digital technology use, and necessary revisions were made based on their input.

The interviews were conducted face-to-face, with each participant being individually interviewed. Before each interview, participants were informed about the research objectives and methodology, and voluntary participation was emphasized. With participants' consent, audio recordings were made during the interviews, and the collected data were later analyzed using descriptive analysis.

Data Analysis

In this study, thematic analysis was employed to examine the impact of digital technologies on perceptions of loneliness in depth. Thematic analysis is a method that systematically identifies and interprets meaningful patterns and themes within data (Boyatzis, 1998; Braun & Clarke, 2012).

During the analysis process, interview recordings were transcribed, and the collected data were thoroughly examined before proceeding with the coding process. Both explicit statements and implicit meanings were considered during coding to comprehensively analyze individuals' experiences of loneliness and digital technology use (Alholjailan, 2012; Namey et al., 2008).

Codes and themes were developed based on relevant literature and participant statements during the data organization and interpretation process. This method facilitated a structured evaluation of the similarities and differences in the data, allowing for a systematic assessment of the effects of digital technologies on loneliness perception (Ültay & Çalık, 2012; Çalık & Sözbilir, 2014).

Reliability of Data

To ensure the reliability of the research findings, various methodological precautions were taken. Given the nature of qualitative research, trustworthiness measures such as confirmability, dependability, credibility, transferability, and coherence of implementation were considered (Lincoln & Guba, 1985; Miles & Huberman, 2019; Yıldırım & Şimşek, 2013). Accordingly:

- The research methodology and analysis process were documented in detail to allow for the re-examination of data.
- Expert opinions were sought during the coding process to enhance the reliability of the analyses.
- Findings were supported by theoretical explanations and direct participant quotations.
- Demographic characteristics of participants were thoroughly described to ensure transferability.
- The compatibility of research findings with research questions was reviewed, and peer review was utilized to confirm the validity of the results.

Findings

This section presents findings regarding participants' interactions with digital technologies, the impact of these technologies on social connections, and their perceptions of loneliness. The five main themes identified—General Experience and Perceptions, Social Connections and Relationships, Loneliness and Digital Interaction, Advantages and Disadvantages of Digital Technologies, and Singlehood and Digital Experiences—are explored in detail, supported by participant insights. The findings reveal that individuals' relationships with technology are multidimensional, leading to both positive and negative consequences in different contexts.

1. General Experience and Perceptions

Category	Frequency (n)	Percentage (%)
The widespread use of technology in daily life	15	34.1%
Negative impact of technology on feelings of loneliness	10	22.7%
Positive impact of technology on feelings of loneliness	8	18.2%

- *"Social media has become a habit for me; I check it every day. It is the easiest way to follow news, friends, and the world."* (P3)
- *"Technology sometimes makes me feel lonelier. The frequency of face-to-face meetings with people has decreased."* (P7)
- *"When I feel lonely, I browse social media, and it makes me feel better. Talking to someone or watching content provides temporary relief."* (P12)

2. Social Connections and Relationships

Category	Frequency (n)	Percentage (%)
Maintaining friendships through social media	12	27.3%
Strengthening family ties	8	18.2%
Building professional relationships	6	13.6%
Weakening of relationships due to social media	9	20.5%

- *"Although I cannot spend much time with my family, we text every day. Thanks to WhatsApp and video calls, our bonds remain strong."* (P4)
- *"I see my friends more on social media than in real life. We meet up less frequently, and instead, we just text online."* (P11)
- *"Because of my job, I use LinkedIn actively. This helps me expand my professional network."* (P18)

3. Loneliness and Digital Interaction

Category	Frequency (n)	Percentage (%)
Using social media when feeling lonely	14	31.8%
Digital communication provides short-term relief	10	22.7%
Insufficiency of digital relationships in the long term	8	18.2%

- *"Sometimes when I feel lonely, I browse social media to pass the time. But it does not replace a real conversation."* (P5)

·   *"Talking to someone in a digital environment provides temporary relief, but in the long run, it does not fully resolve feelings of loneliness."* (P9)

·   *"Social media can be fun, but when I feel lonely, I realize that I cannot have deep conversations with anyone there."* (P14)

4. Advantages and Disadvantages of Digital Technologies

Category	Frequency (n)	Percentage (%)
The biggest advantage of technology: easy access	11	25%
Digital connections are superficial	10	22.7%
Technology increases the sense of isolation	9	20.5%

·   *"Technology allows me to access everything instantly. News, information, communication—it is all at my fingertips."* (P2)

·   *"Relationships have become very superficial. I used to have long conversations with people, but now we only communicate using emojis."* (P6)

·   *"Technology makes my life easier, but sometimes it isolates me from the real world. I spend more time at home, and socialization has decreased."* (P10)

5. Singlehood and Digital Experiences

Category	Frequency (n)	Percentage (%)
Increased social media activity among single individuals	10	22.7%
Meeting new people through digital platforms	9	20.5%
Differences between digital dating and face-to-face interaction	8	18.2%

·   *"As a single person, I am more active on social media. It seems like the only way to meet new people and socialize."* (P8)

·   *"Meeting people through digital platforms sometimes leads to good results, but most of the time, the relationships remain superficial."* (P13)

·   *"I have used dating apps, but forming a real connection is difficult. Everyone seems more distant in the digital space."* (P17)

Discussion

The impact of digital technologies on individuals' perceptions of loneliness and social relationships is increasingly being studied. The five main themes identified in our findings-the widespread use of technology and loneliness perception, social connections and relationships, loneliness and digital interaction, advantages and disadvantages of digital technologies, and singlehood and digital experiences-will be examined in detail within the context of existing literature. Given that this study was conducted with a Turkish sample, it is essential to consider the cultural context. In Turkey, family structure, perceptions of marriage, societal expectations, and adaptation to digital technologies differ significantly from Western societies. For instance, loneliness is not only experienced as an individual emotional state but is also often associated with social belonging and marital status (Kılıç & Alver, 2017). Moreover, individuals' digital interactions are shaped by cultural norms and traditional family values (Kaya, 2021). In this context, the potential of digital technologies to reduce loneliness or strengthen relationships is not solely determined by individual factors but is also limited by cultural acceptability (Güçlü, 2022). Therefore, the findings should be interpreted not only at the individual level but also within a broader sociocultural framework that reflects Turkey's cultural characteristics.

1. The Widespread Use of Technology and Loneliness Perception

The integration of digital technologies into daily life can both increase and reduce perceptions of loneliness. According to Fineberg et al. (2022), excessive use of online platforms increases the risk of addiction, reinforcing social isolation. This aligns with studies showing how social media usage alters individuals' face-to-face communication habits (Kaye et al., 2022).

On the other hand, Lewis (2024) suggests that digital platforms provide a new ecosystem for social connections, enabling individuals to build broad online networks that alleviate loneliness. However, these connections may be superficial

and fail to provide deep social satisfaction. During the COVID-19 pandemic, digital communication became a vital social support mechanism, playing a crucial role in mitigating the effects of isolation (Stuart et al., 2022).

However, experiences of loneliness vary among individuals. Peplau and Perlman's theory of loneliness (1982) states that loneliness arises from a discrepancy between individuals' social expectations and their actual relationships. Whether digital platforms meet individuals' social expectations depends on user experience and interaction quality.

2. Social Connections and Relationships

The impact of digital technologies on individuals' social relationships depends on the structure of the platforms and how individuals use them. Gawer (2021) emphasizes that digital platforms have a dual-sided structure, fostering interactions among users while also directing commercial activities. In this context, individuals' online social connections are shaped by algorithm-driven content.

Research indicates that social media can sustain relationships, but these relationships are often superficial (Sharon & Gal, 2017). Friendships maintained through social media do not fully replace relationships built in the physical world and may be insufficient in alleviating feelings of loneliness.

Kaye et al. (2022) highlight that online interactions differ fundamentally from face-to-face interactions, suggesting that digital communication plays a limited role in strengthening social bonds. Unlike in-person connections, online interactions may not facilitate deep relationships, potentially increasing individuals' sense of isolation (Zheng et al., 2023).

3. Loneliness and Digital Interaction

Digital platforms can serve as tools for alleviating loneliness, but debates persist regarding the sustainability and depth of these interactions. According to Peplau and Perlman's (1982) theoretical framework, loneliness stems from a gap between social expectations and actual relationships. Digital platforms may temporarily reduce feelings of

loneliness, but they may not be sufficient in enhancing long-term social fulfillment (Kaye et al., 2022).

During the COVID-19 pandemic, digital technologies became essential for maintaining social connections (Stuart et al., 2022). However, studies emphasize that digital interactions cannot fully replace physical social bonds, and the lack of face-to-face interactions may intensify feelings of loneliness (Fineberg et al., 2022).

Sharon and Gal (2017) argue that social media has limited effectiveness in reducing loneliness, as extended time spent on social media does not necessarily decrease loneliness in the long run. The lack of emotional depth in digital interactions can be a factor that exacerbates loneliness (Akhter-Khan et al., 2023).

4. Advantages and Disadvantages of Digital Technologies

One of the biggest advantages of digital technologies is their ability to provide quick access to information and social networks. However, this accessibility can also lead to superficial relationships, preventing individuals from forming meaningful social connections (Gawer, 2021).

Zheng et al. (2023) conducted AI-assisted analyses examining how digital communication affects loneliness and depression levels. Their findings indicate that superficial online interactions may contribute to long-term loneliness experiences.

Conversely, Akhter-Khan et al. (2023) suggest that digital technologies can help reduce loneliness among older adults, but the effectiveness of these interactions depends on the quality of engagement and the individual's digital literacy.

5. Singlehood and Digital Experiences

Singlehood is becoming an increasingly common lifestyle in modern societies. Erdoğan (2020) describes singlehood as a new norm, shaped by social and economic dynamics, with individuals relying on digital platforms to fulfill their social needs.

Sharon and Gal (2017) argue that relationships established through digital platforms may lack the

emotional depth of face-to-face interactions, potentially intensifying feelings of loneliness. However, research also indicates that online dating platforms can help individuals establish social connections and provide short-term relief from loneliness (Lewis, 2024).

Conclusion

While digital technologies can help alleviate feelings of loneliness, they can also lead to superficial relationships. Loneliness arises from the discrepancy between individuals' social expectations and actual relationships, and digital platforms do not always fully meet these expectations.

To develop effective solutions for reducing loneliness, it is crucial to:

· Promote face-to-face interactions,
· Improve digital literacy, and
· Ensure that individuals can use digital platforms to build meaningful social connections.

A more holistic approach that balances digital and offline interactions is essential to effectively address loneliness in the digital age.

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