DOI: 10.4274/jbuch.galenos.2025.89166
J Dr Behcet Uz Child Hosp

Original Article

Digital Rights Access and Social Exclusion Dynamics of Children with Disabilities: A Mixed-Methods Study

Engelli Çocukların Dijital Haklara Erişimi ve Sosyal Dışlanma Dinamikleri: Karma Yöntemlerle Yapılmış Bir Araştırma

Emine Gültekin[1], Dilek Orbatu[2], Zeynep İzem Peker Bulğan[2], Süleyman Gök[3], Begüm Güler[4]

[1]Katip Celebi University, Atatürk Training and Research Hospital, Department of Educational Research and Development, İzmir,Türkiye
[2]University of Health Sciences Türkiye, Dr. Behçet Uz Children's Hospital and Research Center for Pediatric Diseases and Surgery, Clinic of Pediatrics, İzmir, Türkiye
[3]Izmir Accessible Living Association, İzmir, Türkiye
[4]Izmir Democracy University Faculty of Health Sciences, Department of Public Health Nursing, İzmir, Türkiye

ABSTRACT

Objective: This study aims to examine how structural, social, and economic inequalities influence the rights of children with disabilities to access, participate, and be protected in digital environments in Türkiye.

Method: A cross-sectional mixed-methods study design was adopted. The sample consisted of 82 children with disabilities aged 12-15 years living in Izmir, Türkiye. Quantitative data were collected using a Socio-Demographic Information Form, the Cyber Victimization Scale, and the Social Exclusion Scale for Children (SESC). Qualitative data were obtained through semi-structured interviews with 20 children and 15 parents. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed through thematic content analysis.

Results: Most children owned a smartphone (88.6%), whereas 38.6% had a computer and 37.1% had a tablet; while 38.0% of households lacked fixed internet access. Among visually impaired children, 40.0% reported that screen readers were outdated, non-functional, or insufficient, whereas children with hearing impairments frequently reported a lack of subtitles. According to the SESC, 35.4% lacked financial access to healthcare services, 23.2% could not access safe housing, and 25.6% were unable to regularly participate in social activities. Online risks included receiving insulting (30.5%) or sexually explicit (8.5%) messages, offensive nicknames (24.4%), being mocked or excluded from games or chats (20.7%), unauthorized sharing of private content (17.1%). More than half (57.3%) of the children were unable to assess online information reliability, 21.4% were unaware of digital opportunities, and 32.1% had never produced digital content. Additionally, 52.4% of parents did not approve of their children sharing content on social media. Themes emerging from the qualitative analysis included access to digital technologies, digital development and literacy, disability-specific content, participation rights, experiences of digital rights violations, responsibilities, complaint mechanisms, and privacy and safety.

Conclusion: Digital access among children with disabilities is restricted by device, connectivity, and accessibility gaps; participation is constrained by material deprivation; and cyber risks remain prevalent. These findings highlight that digital participation is a multidimensional rights issue requiring strengthened digital literacy, standardized accessibility, and effective protection and reporting mechanisms.

Keywords: Disabled children, internet access, cyberbullying, digital divide

ÖZ

Amaç: Bu çalışma, Türkiye'de engelli çocukların dijital ortamlardaki erişim, katılım ve korunma haklarının yapısal, sosyal ve ekonomik eşitsizliklerden nasıl etkilendiğini incelemeyi amaçlamaktadır.

Yöntem: Kesitsel karma yöntem tasarımı kullanılmıştır. Örneklem, İzmir'de yaşayan 12-15 yaş arası 82 engelli çocuktan oluşmuştur. Nicel veriler Sosyodemografik Bilgi Formu, Siber Mağduriyet Ölçeği ve Çocuklar için Sosyal Dışlanma Ölçeği (SESC) ile; nitel veriler 20 çocuk ve 15 ebeveynle yapılan yarı yapılandırılmış görüşmelerle toplanmıştır. Nicel veriler tanımlayıcı istatistiklerle, nitel veriler tematik içerik analiziyle çözümlenmiştir.

Bulgular: Katılımcıların %88,6'sının akıllı telefonu bulunurken, %38,6'sının bilgisayarı ve %37,1'inin tableti vardır; hanelerin %38,0'ında sabit internet bulunmamaktadır. Görme engelli çocukların %40,0'ı ekran okuyucuların yetersiz/çalışmadığını; işitme engelli çocuklar sıklıkla altyazı eksikliğini bildirmiştir. SESC'ye göre sağlık hizmetlerine maddi erişimi olmayanlar %35,4; güvenli/konforlu konuta erişemeyenler %23,2; sosyal etkinliklere düzenli katılamayanlar %25,6'dır. Çevrimiçi riskler arasında hakaret içeren mesajlar (%30,5), aşağılayıcı lakaplar (%24,4), oyun/sohbetlerden alay edilme veya dışlanma (%20,7), özel içeriklerin izinsiz paylaşımı (%17,1) ve cinsel içerikli mesajlar (%8,5) öne çıkmaktadır. Çocukların %57,3'ü çevrimiçi bilginin güvenilirliğini ayırt edemediğini, %21,4'ü internet olanaklarından haberdar olmadığını, %32,1'i hiç dijital içerik üretmediğini bildirmiştir. Ebeveynlerin %52,4'ü çocuklarının sosyal medyada içerik paylaşmasını onaylamamıştır. Nitel bulgular; dijital teknolojilere erişim, dijital gelişim/okuryazarlık, engelliliğe özgü içerik, katılım hakları, hak ihlali deneyimleri, sorumluluklar, başvuru/şikayet mekanizmaları ve mahremiyet-güvenlik temalarını ortaya koymuştur.

Received: 10.10.2025
Accepted: 03.11.2025
Epub: 06.01.2026

Corresponding Author
Emine Gültekin,
Katip Celebi University Atatürk Training and Research Hospital, Department of Educational Research and Development , İzmir,Türkiye
E-mail: emine_gultekin@yahoo.com.tr
ORCID: 0000-0003-3782-9878

Cite as: Gültekin E, Orbatu D, Peker Bulğan Zİ, Gök S, Güler B. Digital rights access and social exclusion dynamics of children with disabilities: a mixed-methods study. J Dr Behcet Uz Child Hosp. [Epub Ahead of Print]

Sonuç: Engelli çocuklarda dijital erişim cihaz–bağlantı–erişilebilirlik açıklarıyla sınırlanmakta; katılım maddi yoksunlukla daralmakta; korunmada siber riskler yaygın seyretmektedir. Bulgular, dijital katılımın çok boyutlu bir hak meselesi olduğunu doğrulamakta; dijital okuryazarlığın güçlendirilmesi, erişilebilirliğin standartlaştırılması ve etkili koruma/başvuru mekanizmalarının güvence altına alınması gereğine işaret etmektedir.

Anahtar kelimeler: Engelli çocuklar, internet erişimi, siber zorbalık, dijital uçurum

INTRODUCTION

Digitalization has profoundly reshaped the way the children play, learn, communicate, and express themselves. Children are no longer passive consumers of online content but active participants in digital spaces[1,2]. This transformation calls for a redefinition of children's rights in the digital era. Articles 12, 13, and 17 of the United Nations Convention on the Rights of the Child guarantee children's rights to express views, access information, and enjoy freedom of expression. General Comment No. 25 (2021) on children's rights reinforces that these rights apply equally in digital environments[3].

For children with disabilities, digital participation offers opportunities for inclusion and visibility. However, when accessibility is limited, these opportunities turn into risks of exclusion[4,5]. Accessibility is a multidimensional issue that goes beyond technology to encompass social, economic, and political factors. Assistive tools like screen readers, captions, or adaptive interfaces are essential but often insufficient or unavailable. Studies in Türkiye indicate that digital content rarely aligns with disability-specific needs, and public services lack consistent accessibility standards[4,5].

Digital inequality is shaped not only by technical factors but also by structural disadvantages such as poverty, parental education, and family digital literacy[6,7]. In low-income households, children often face limitations in accessing devices, stable internet connection, and digital educational resources. These disparities are amplified for children with disabilities, especially when intersecting with gender and geographic disadvantages. For instance, girls with disabilities in under-resourced areas may experience compounded forms of exclusion both online and offline.

This study investigates how structural, social, and economic inequalities negatively influence the rights of children with disabilities to access, participate, and be protected in digital environments in Türkiye. Using a mixed-methods approach, it explores digital exclusion as a form of structural inequality and aims to contribute to inclusive, rights-based digital policy discussions.

MATERIALS and METHODS

This study was designed using a mixed-methods approach to comprehensively examine the multidimensional inequalities faced by children with disabilities in digital environments. The research employed a cross-sectional, non-interventional, and single-center design, incorporating both quantitative and qualitative data collection techniques.

This study was approved by the Non-Interventional Ethics Committee of Dr. Behçet Uz Children's Diseases and Surgery Training and Research Hospital (decision no.: 2025/01-07, dated: 09.01.2025.). Informed written consent was obtained to ensure the voluntary participation of children and their families. Throughout the research process, principles of confidentiality, protection of personal data, and respect for children's rights to expression and representation in digital spaces were strictly observed. Surveys were conducted anonymously, and the data collected were used solely for academic analysis and advocacy purposes. Data collection procedures adhered to the principles outlined in UNICEF's Research Ethics in Evaluation (2021), the Declaration of Helsinki, and GDPR/KVKK regulations.

The study population consisted of 850 children with disabilities aged 12-15 years who applied to the Pediatric Outpatient Clinics of Dr. Behçet Uz Children's Hospital in 2024 Among them a total of 80 children who met the inclusion criteria and selected by simple random sampling method were enrolled in the study after they and their parents had given their voluntary consent.

The adequacy of the sample size was determined through an a priori power analysis, assuming a medium effect size (d=0.5), a level of statistical significance (p=0.05), and a statistical power of 0.80[8]. The analysis indicated that at least 60 participants would be sufficient; thus, the planned sample size consisting of 80 participants was considered adequate to ensure statistical reliability[8,9].

The Patients Who:

- Were between 12-15 years of age,
- Had an official disability report (visual, hearing, physical, or intellectual disability), with a minimum impairment level of 40% as required by national guidelines,
- Obtained written voluntary consent of their parents,
- Expressed their willingness to participate in the study consisted the study population.

Exclusion Criteria:

- Children with severe cognitive disabilities preventing effective communication,
- Lack of parental consent for participation.

Data were collected using the Sociodemographic Information Form, the Cyber Victimization Scale, and the Social Exclusion Scale for Children (SESC). For the qualitative strand data analysis, semi-structured interviews were conducted with 20 children and 15 parents. Data saturation was considered achieved at this point.

Sociodemographic Information Form

A Sociodemographic Information Form, developed by the researchers, was used to identify participants' background characteristics. The form included questions on children's age, gender, and type of disability, as well as parental education, occupation, and socioeconomic status. In addition, children's ownership of digital devices (smartphones, computers, tablets), the frequency of internet access, social media and online platform use were assessed which allowed for a systematic evaluation of the relationship between families' and children's digital access conditions and sociodemographic factors.

Cyber Victimization Scale

The Cyber Victimization Scale was developed by Arıcak et al.[10] to assess adolescents' experiences of victimization in online environments. The scale consists of 24 items, each one is responded dichotomously as "Yes" (2 points) or "No" (1 point). It has a unidimensional structure with no reverse-coded items. The total score ranges from 24 to 48, with higher scores indicating greater levels of cyber victimization. The scale demonstrated high internal consistency, with a Cronbach's alpha coefficient of 0.89.

SESC

The SESC was developed by Jiang et al.[11] to assess multidimensional social exclusion using a reliable and valid self-report measure. The adaptation and cultural-linguistic validation of the Turkish version of the scale were carried out by Karakaya et al.[12]. The SESC consists of 19 items rated on a 5-point Likert scale, each reflecting a different dimension of children's experiences of social exclusion. The Turkish adaptation studies confirmed that the scale is age-appropriate, practical, easy to administer, and psychometrically reliable[12].

Statistical Analysis

The data obtained in this study were analyzed using a mixed-methods approach that combined both quantitative and qualitative techniques. Quantitative data were analyzed using the IBM® Statistical Package for the Social Sciences (SPSS) software that employed descriptive statistical methods. Frequency distributions, percentages, and cross-tabulations were employed to determine general trends regarding children's access to digital tools, usage patterns, social media experiences, awareness of online safety, and exposure to digital risks. In addition, the effects of demographic variables such as gender, age, type of disability, and levels of parental education on children's digital experiences were examined in detail. These analyses revealed that digital inequality is shaped not only by technical infrastructure but also by broader social conditions.

Qualitative data were analyzed using thematic content analysis. The transcripts of semi-structured interviews were first subjected to open coding, after which the codes were clustered into thematic categories to construct an analytical framework. Four key themes emerged from this process: "barriers to access digital tools," "families' lack of digital literacy," "perceptions of online safety and privacy," and "limitations in freedom of expression and participation in digital spaces." Thus, the qualitative analysis deepened and contextualized the quantitative findings, providing a more comprehensive understanding of children's digital experiences.

RESULTS

The participating children had physical disabilities (n=40; 50.0%), visual (n=24; 29.3%) and hearing (n=17; 20.7%) impairments. The study population consisted mostly of boys (64.6%, n=53) rather than girls (35.4%, n=29). Regarding parental education levels, the majority of mothers were primary school graduates (40.7%, n= 33), with only 8.6% (n=7) of them holding a university degree.

Table 1. Demographic characteristics of children				
Variable			**n**	**%**
Type of disability	Physical disability		41	50.0
	Physical disability		24	29.3
	Physical disability		17	20.7
Gender	Female		29	35.4
	Male		53	64.6
Mother's education	Literate only		14	17.3
	Primary school		33	40.7
	Secondary school		11	13.6
	High school		16	19.8
	University		7	8.6
Father's education	Literate only		10	12.2
	Primary school		21	25.6
	Secondary school		22	26.8
	High school		25	30.5
	University		4	4.9
Owned digital services	Smartphone		62	88.6
	Computer		27	38.6
	Tablet		26	37.1
	Min	**Max**	**Mean**	**SD**
Age (years)	8.00	18.00	13.23	1.98
Age of first digital exposure (years)	5.00	15.00	9.67	2.47
SD: Standard deviation				

Fathers had slightly higher educational attainment, with 30.5% (n=25) of them graduating from high school. In terms of digital device ownership, smartphones were most frequently used digital device by the participants (88.6%, n=62), while computer (38.6%, n=27) and tablet (37.1%, n=26) ownership remained at a comparatively lower rate (Table 1).

Digital Access Problems by Type of Disability

At least 40.0% (n=10) of visually impaired children reported that their screen reader software did not work, was outdated, or inadequate in Turkish content. Hearing-impaired children reported that they were receiving unpleasant (n=2; 12.2%) or insulting messages (n=2; 9.8%), and being mocked (n=1; 8.5%), and threatened (n=1; 4.9%) (Figure 1).

Spatial and Socioeconomic Context

A total of 31 (38.0%) participants reported that they did not have a fixed internet connection at home and could only access the internet using their parents' mobile data.

Among parents, only 7 (8.6%) mothers and 4 fathers (4.9%) were university graduates. Based on the responses given to the items of The SESC, 35.4% (n=29) of participants reported that their families did not have sufficient financial means to access medical services, 23.2% (n=19) could not afford to live in a safe and comfortable home, and 25.6% (n=19) were unable to participate regularly in social activities (Figure 2).

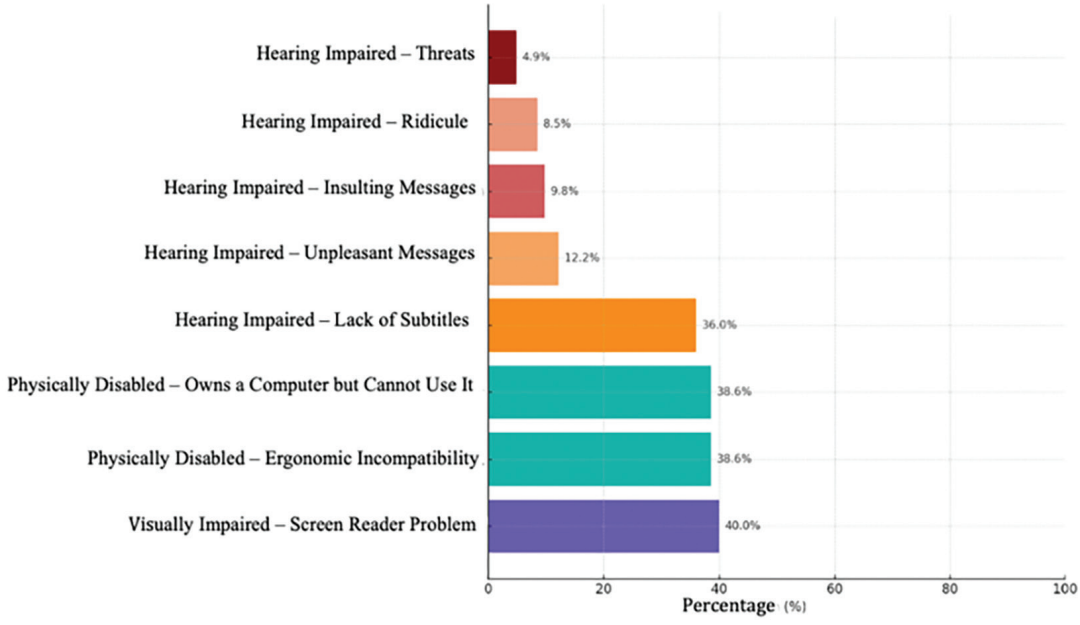

Figure 1. Digital access and safety issues by disability type

Digital Literacy and Information Accessibility

The indicated number (%) of study participants reported that they could not determine the reliability of information on the internet (n=47; 57.3%), had never produced digital content (n=26;32.1%), and were not aware of the opportunities provided by the internet (n=18; 21.4%),

Additionally, they reported that they had received insulting (n=25;30.5%) or sexually explicit (n=7; 8.5%) messages, had been called by offensive nicknames (n=20;24.4%), and their private photos or videos were shared without permission (n=7;8.5%) (Figure 3).

Safety and Digital Violence Experiences

The study participants also reported that they had received insulting (n=25; 30.5%) or sexually explicit (n=14; 17.1%) messages, had been called by offensive nicknames (n=20; 24.4%) or mocked or excluded from games, chats, or social groups (n=17; 20.7), and their private photos or videos had been shared without permission (n=14; 17.1%).

The majority of children stated that they did not report these experiences to any complaint mechanism (Figure 4).

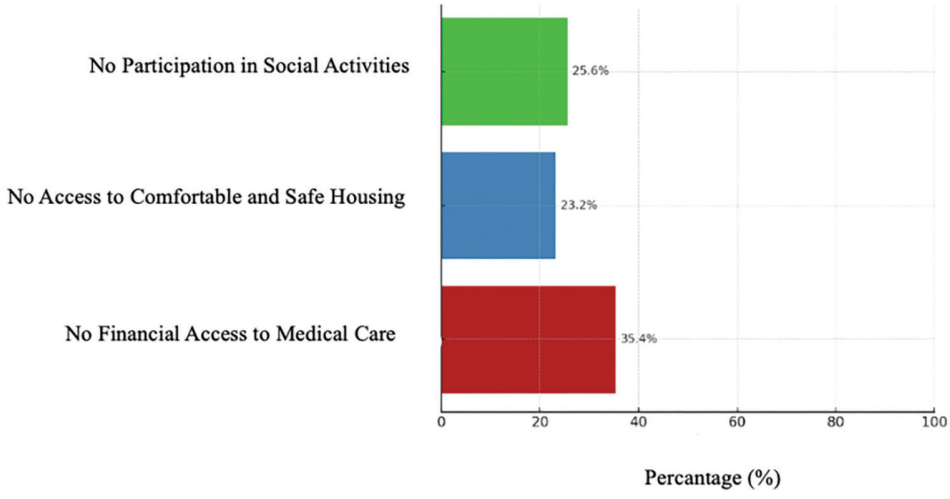

Figure 2. Indicators of social exclusion among children with disabilities

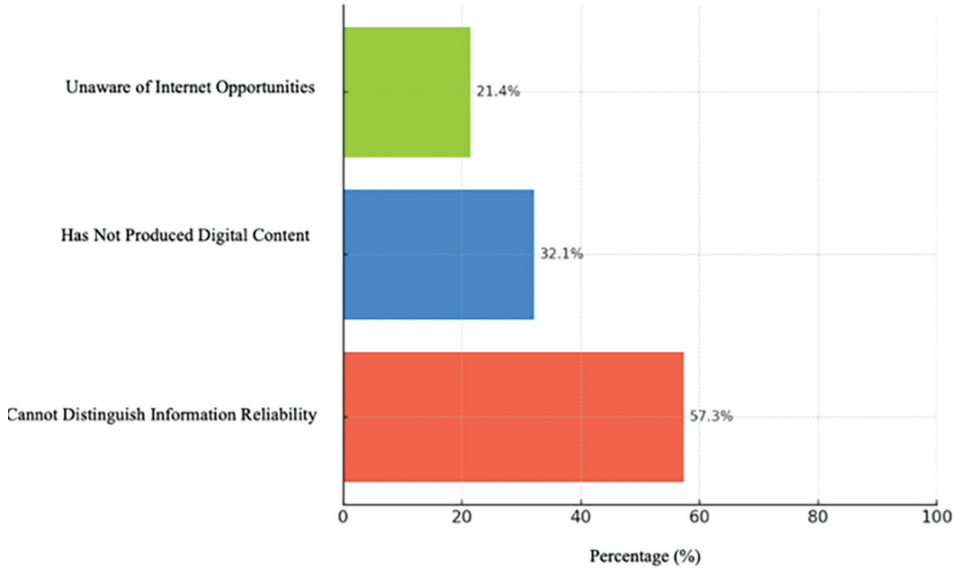

Figure 3. Limitations in digital literacy among children with disabilities

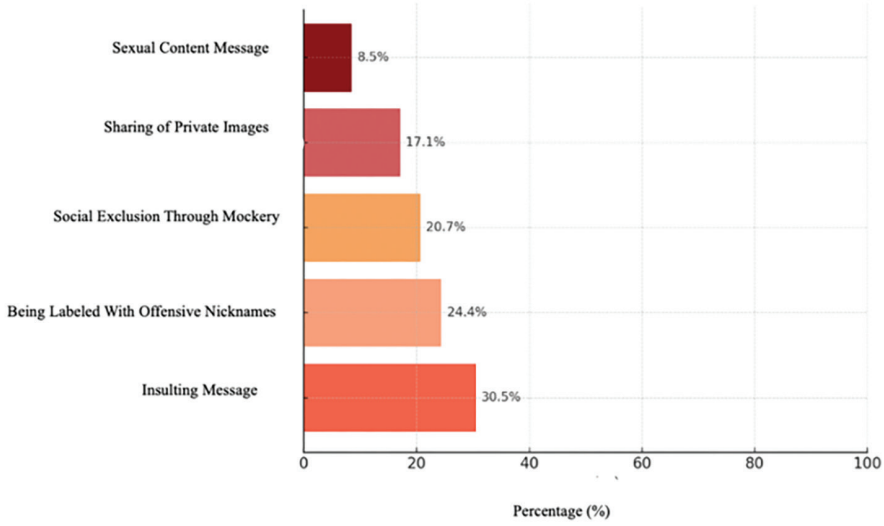

Figure 4. Rights violations in digital environments among children with disabilities

Right to Participation and Visibility

A total of 15 (18.3%) children reported that they had produced digital content. Additionally, they stated that they had not received any support regarding freedom of expression online (n=26; 32.1%), felt unsafe when sharing their opinions (n=34; 41.5%), experienced excessive parental control (n=24; 29.3%), and faced bullying when expressing their views (n=18; 21.9%). Finally, 43 (52.4%) parents reported that they had not approved of their children sharing content on social media (Figure 5).

Qualitative Findings

The qualitative interviews revealed eight main themes: (1) access to digital technologies, (2) the right to digital development and digital literacy, (3) access to content tailored to specific needs, (4) participation rights in digital environments, (5) experiences of digital rights violations, (6) responsibilities in digital environments, (7) defense mechanisms against rights violations, and (8) perceptions of privacy and security rights.

Theme 1: Access to Digital Technologies

Participants reported difficulties in accessing and using devices depending on their type of disability. Visually impaired children emphasized the malfunction or inadequacy of screen readers, physically disabled children mentioned challenges with keyboards, mice, and touchscreens, and hearing-impaired children reported the lack of subtitles and sign language support. High costs of

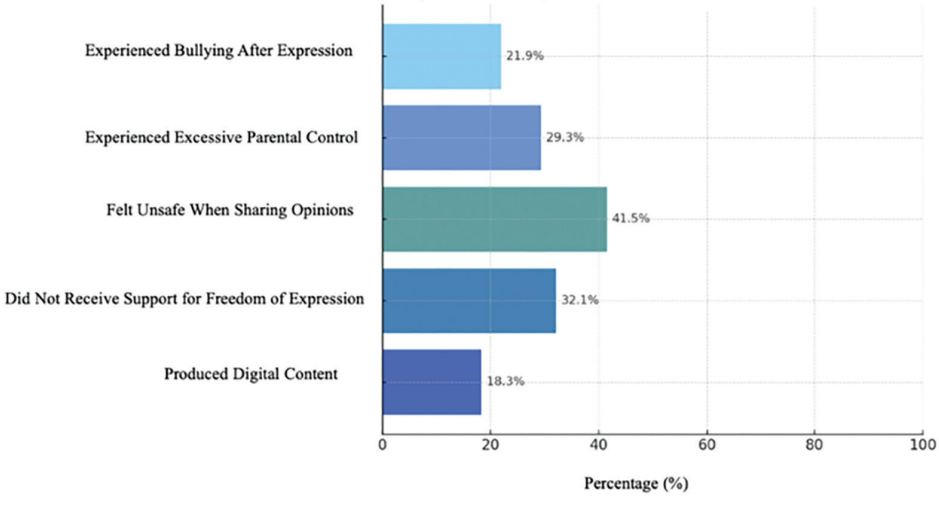

Figure 5. Experiences of digital participation and freedom of expression among children with disabilities

special devices, limited internet access, and difficulties communicating needs to families were also mentioned.

- "It is hard for me to access digital technologies because I need special tools like a screen reader. But these tools sometimes do not work properly." (C1, visually impaired, age 13).
- "I have a phone, but using a touchscreen is difficult for me. A phone with larger buttons would be better." (C4, physically disabled, age 12).
- "We have an old computer that barely works…using the keyboard or the mouse is really hard." (C8, physically disabled, age 13).

Theme 2: Right to Digital Development and Digital Literacy

Children expressed challenges in exercising their rights to digital development due to lack of knowledge, insufficient programs, and access barriers. They indicated a desire to improve digital literacy but noted difficulties in staying safe online and identifying reliable information.

- "Digital literacy teaches me how to find the right information and stay safe online. I want to learn more about this." (C2, visually impaired, age 12).
- "I want to develop myself in the digital world like everyone else, but it is hard when I don't understand how everything works." (C5, physically disabled, age 14).

Theme 3: Access to Content Tailored to Specific Needs

Participants reported limited access to educational materials suitable for their disabilities, noting that existing content was scarce or not engaging.

- "My access to special educational materials is very limited." (C1, visually impaired, age 13).
- "There are audio books and screen readers, but they are not interesting enough, and games are very few." (C2, visually impaired, age 12).
- "It is difficult to find content designed for children like me. I want to access more." (C4, physically disabled, age 12).

Theme 4: Participation Rights in Digital Environments

Children described restrictions in community-building and participation, with accessibility gaps and fear of bullying as major issues.

- "Children with disabilities hide their identities because of the fear of exclusion… we are also afraid of being bullied in digital life." (C2, visually impaired, age 12).
- "There should be online platforms where children with disabilities can talk and play together." (C4, physically disabled, age 12).
- "Since people cannot hear me online, I get excluded from chats and games." (C7, hearing impaired, age 13).

Theme 5: Experiences of Digital Rights Violations

Participants reported facing harassment, discrimination, and mockery online, along with accessibility issues. These experiences were often associated with sadness and withdrawal.

- "Once while playing a game online, a group of kids teased me and made fun of me. I blocked them, but I still felt upset." (C3, hearing impaired, age 14).
- "When I was playing a game, other kids mocked me. I felt bad and left the game." (C4, physically disabled, age 12).
- "Sometimes I feel excluded or ignored online because of my disability." (C8, physically disabled, age 13).

Theme 6: Responsibilities in Digital Environments

Children stated that individuals should behave respectfully, institutions should provide inclusive programs and safe content, and developers should design accessible games and websites.

- "The state and internet companies should create programs and content for children with disabilities." (C3, hearing impaired, age 14).
- "There should be laws and regulations to make it easier for children with disabilities to access their rights." (C4, physically disabled, age 12).
- "Websites and games should work for everyone. This is not just about being kind; it is about equal treatment." (C8, physically disabled, age 13).

Theme 7: Defense Mechanisms Against Rights Violations

Most participants reported not knowing where to file complaints, while some mentioned asking teachers or parents for help. The need for complaint hotlines and support systems was highlighted.

- "I don't report problems to anyone because I don't know where to apply." (C1, visually impaired, age 13).

- "I don't know where to apply. It is important to have resources that provide support." (C5, physically disabled, age 14).
- "If something bad happens online, I think I could talk to my parents or teacher." (C7, hearing impaired, age 13).

Theme 8: Privacy and Security Rights

Participants highlighted the need to protect personal information, safe use of the internet, and be taught clearer rules.

- "I don't share my personal information much, but I don't know who gets it." (C2, visually impaired, age 12).
- "I don't know how my information is used online. I wish someone could teach me how to stay safe." (C3, hearing impaired, age 14).
- "I don't always know how to protect myself online… there should be clearer rules or guidelines." (C7, hearing impaired, age 13).

DISCUSSION

Children's experiences with digital technologies should be understood not only as individual usage patterns but as processes through which broader social inequalities are reproduced online. In this study, children with disabilities encountered predominantly interpersonal conduct harms (e.g., insulting messages, name-calling, exclusion) rather than purely content-based threats, aligning with digital inequality frameworks and Livingstone and Helsper's[13] and Livingstone's[14] 4Cs model that classifies online risks exposed by children at the intersection of content, contact, conduct, and commercial factors. Interpreting our mixed-methods evidence together suggests that limited accessibility features, constrained device/connectivity conditions, and low parental digital literacy converge to limited safe participation and increase vulnerability to peer-to-peer harms.

These patterns are consistent with comparative European findings showing that cyberbullying and social exclusion remain the most frequent online risks[15] together with work documenting the psychosocial toll of online aggression[16]. The relatively lower cyberbullying levels observed in our sample vis-à-vis multinational European Union Kids Online research network may reflect more passive digital participation (e.g., limited content production), which can reduce exposure to privacy violations without fully mitigating conduct-related harms. Such variation also likely reflects contextual differences in parental mediation and platform practices across diverse settings.

Children's first-hand reports of malfunctioning screen readers, absent captions/sign language, and inadequate assistive tools mirror international evidence linking weak accessibility standards to exclusion from learning and social life[17,18]. Our findings extend this literature by showing how everyday accessibility gaps interact with poverty and limited parental digital competence to shape risk exposure and self-censorship.

Socioeconomic and familial constraints further structure digital opportunity. Low parental education and limited household resources were salient, consistent with research showing that socioeconomic status and parental digital competence shape inclusion trajectories[19,20]. In our context, modest parental educational attainment likely weakens protective mediation, reinforcing disadvantage despite children's motivation to engage.

Qualitative accounts illuminated the emotional mechanisms linking exclusion and participation ie. ridicule, fear, and withdrawal curtailed expression and visibility, while restrictive parental norms including disapproval of children's sharing aggravated sociocultural constraints[21,22]. Children also articulated clear expectations for protective structures (accessible reporting channels, inclusive platform design, enforceable rules), underscoring that online safety requires both individual competencies and assistive institutional infrastructures[23].

Overall, the convergence of quantitative and qualitative strands indicates that children with disabilities are disproportionately exposed to multidimensional risks while being excluded from the benefits of meaningful participation. We argue that digital participation for this group is fundamentally an equity and rights issue requiring universal design, accessible content/services, strengthened digital literacy for families and educators, and child-centred governance that ensures effective and usable redress mechanisms.

Methodological note: Because disability types were heterogeneous and subgroup sizes were limited and unequal, we did not conduct inferential comparisons across groups and reported descriptive patterns only (see Limitations). Future studies should use stratified recruitment, a priori power for subgroup analyses, and multilevel/stratified models to better account for heterogeneity.

Strengths of the Research

One of the key strengths of this study is the adoption of a dual analysis strategy, whereby general trends identified through quantitative data were integrated with individual narratives. This approach enabled both a structured and also flexible level of interpretation, consistent with the theoretical foundations of the study. Moreover, by framing children as active subjects rather than passive respondents, the analysis emphasized not merely representational but also transformative characteristics of data. This perspective contributed favorably to both ethical and methodological originality of our research.

Study Limitations

Despite its carefully designed mixed-methods strategy, this study has certain limitations. Firstly, national generalizability of this research is limited because fieldwork was conducted exclusively in İzmir, and the findings are context-specific and may not fully represent children with disabilities across Türkiye. Second, although diversity in disability types was considered at sampling, sizes of subgroups (e.g., physical, visual, and hearing) were small and unequal, introducing heterogeneity that may influence device access, accessibility needs, digital literacy, and exposure to online risks. We therefore refrained from making inferences between-group comparisons and reported descriptive patterns only (see Figure 1), which should be borne in mind when interpreting differences across disability types. In addition, certain populations particularly children with intellectual disabilities, pervasive developmental disorders, or neurodiverse profiles were under-represented, narrowing the scope of insights into their digital experiences. Future studies should employ stratified recruitment, a priori power calculations for subgroup comparisons, and multilevel or stratified analytic models to better account for heterogeneity.

CONCLUSION

This study shows that device access alone does not ensure meaningful, safe, and equitable digital participation for children with disabilities. Evidence from both methods indicates that structural barriers (insufficient accessibility features, low parental digital literacy, and socio-economic disadvantage) limit children's ability to benefit from digital opportunities with persistence of psychosocial risks (cyberbullying, privacy breaches, social exclusion). Digital inequality is patterned by place and poverty, with disadvantaged districts facing greater risks due to weak infrastructure and limited guidance. These results call for rights-based, inclusive, and sustainable policies that mainstream universal design, build robust protections against digital violence, and strengthen digital literacy among children, families, and educators, alongside with targeted infrastructure investments and child participation in policymaking. Overall, digital participation for children with disabilities should be treated as an equity and rights issue. Future research should employ longitudinal and comparative designs to assess structural interventions.

Ethics

Ethics Committee Approval: This study was approved by the Non-Interventional Ethics Committee of Izmir Dr. Behçet Uz Children's Diseases and Surgery Training and Research Hospital with decision numbered 2025/01-07, dated 09.01.2025.

Informed Consent: Informed written consent was obtained to ensure the voluntary participation of children and their families.

Footnotes

Author Contributions

Concept: E.G. D.O., Z.İ.P.B., Design: E.G. D.O., Z.İ.P.B., Data Collection or Processing: E.G., Z.İ.P.B., Analysis or Interpretation: E.G., S.G., Literature Search: E.G., D.O., Z.İ.P.B., B.G. Writing: D.O., E.G., Z.İ.P.B., B.G.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: No potential conflict of interest was reported by the authors.

REFERENCES

1. Kaesling M. A rights-based approach to children's digital participation. In: Children's Rights and Digital Technologies. Springer VS; 2023. p. 67-88. doi: 10.1007/978-3-65841012-3_4
2. Livingstone S. Digital play on children's terms: a child rights approach. New Media Soc. 2025. doi: 10.1177/14614448251345678
3. UNICEF Office of Research – Innocenti. Best interests of the child in relation to the digital environment. Florence: UNICEF Innocenti; 2025. Available from: https://www.unicef-irc.org/publications/. [Accessed: 27 Oct 2025].
4. Björnsdóttir K, Stefánsdóttir GV, Traustadóttir R, Sigurjónsdóttir HB. The digital exclusion of people with intellectual disabilities during the COVID-19 pandemic. Scand J Disabil Res. 2024;26(1):1-12. doi: 10.16993/sjdr.1101
5. Nectoux M. Sensing technologies, digital inclusion, and disability diversity. J Comput Mediat Commun. 2023;28(5):zmad026. doi: 10.1093/jcmc/zmad026
6. Tsatsou P. Vulnerable people's digital inclusion: intersectionality patterns and associated lessons. Inf Commun Soc. 2019;22(14):2120-138. doi: 10.1080/1369118X.2018.1477978

7. Soldatic K, Lee M, Tunggal E, Liao A, Magee L. Rethinking digital and AI inclusion: participatory and intersectionality-informed methods for disability and migrant justice. Front Sociol. 2025;10:1593330. doi: 10.3389/fsoc.2025.1593330
8. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale (NJ): Lawrence Erlbaum Associates; 1988.
9. Faul F, Erdfelder E, Lang A-G, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):17-91. doi: 10.3758/BF03193146
10. Arıcak TO, Tanrıkulu T, Kınay H. Siber mağduriyet ölçeğinin ilk psikometrik bulguları [first psychometric findings of the cyber victimization scale]. Akdeniz Eğitim Araştırmaları Dergisi. 2012;11:1-6
11. Jiang S, Jiang C, Cheng Y, Li W. Multidimensional measurement of child social exclusion: development and psychometric properties of the social exclusion scale for children (SESC). Child Youth Serv Rev. 2022;141:106624. doi: 10.1016/j.childyouth.2022.106624
12. Karakaya C, Özsavran M, Kurt A. The social exclusion scale for children (SESC): a validity and reliability study in Turkish. J Soc Serv Res. 2024;50(2):1-13. doi: 10.1080/01488376.2024.2375518
13. Livingstone S, Helsper EJ. Gradations in digital inclusion: children, young people and the digital divide. New Media Soc. 2007;9(4):671-96. doi: 10.1177/1461444807080335
14. Livingstone S. Addressing the risks and opportunities of online exposure for children. J Children Media. 2021;15(1):5-14. doi: 10.1080/17482798.2020.185843
15. Stoilova M, Livingstone S, Khazbak R. Investigating risks and opportunities for children online: a comparative perspective. Eur J Commun. 2021;36(5):470-89. doi: 10.1177/02673231211020121
16. Patchin JW, Hinduja S. Cyberbullying and self-esteem. J Sch Health. 2010;80(12):614-21; quiz 622-4. doi: 10.1111/j.1746-1561.2010.00548.x
17. Alper M, Goggin G. Digital technology and rights in the lives of children with disabilities. New Media Soc. 2017;19(5):726-40. doi: 10.1177/1461444816686323
18. Organisation for Economic Co-operation and Development (OECD). Children in the digital environment: rights, risks and opportunities. Paris: OECD Publishing; 2021. doi: 10.1787/fe7e7a2f-en
19. Lissitsa S, Chachashvili-Bolotin S. The effect of socioeconomic status (SES) and digital inequalities on academic achievements: a multilevel analysis of Israeli students. Comput Educ. 2016;102:13-23. doi: 10.1016/j.compedu.2016.06.008
20. Nikken P, Schols M. How and why parents guide the media use of young children. J Child Fam Stud. 2015;24(11):3423-435. doi: 10.1007/s10826-015-0144-4
21. Katz V, Jordan AB, Ognyanova K. Digital inequality, youth, and disability: evidence from a national survey. J Comput Mediat Commun. 2019;24(3):141-59. doi: 10.1093/jcmc/zmz006
22. United Nations Children's Fund (UNICEF). The state of the world's children 2017: children in a digital world. New York: UNICEF; 2017. Available from: https://www.unicef.org/publications/state-worlds-children-2017. [Accessed: 27 Oct 2025].
23. UNICEF. Digital technologies, child rights and well-being: policy brief. Brussels: UNICEF; 2022. Available from: https://www.unicef.org/eu/media/2586/file/Digital%20technologies%20policy%20brief.pdf. [Accessed: 20 Oct 2025].