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Intersectional and contextual patterning of online harassment in the context of technology-facilitated gender-based violence: Insights from Kenya

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Abstract

Technology-facilitated gender-based violence (TFGBV) threatens equitable digital participation, yet evidence on how harassment intersects with social position, digital engagement and local context in sub-Saharan Africa is limited. Drawing on 854 DigiKen needs-assessment respondents recruited through 14 digital innovation hubs across 11 Kenyan counties, this study combined quantitative analysis of reported online harassment with descriptive analysis of respondents' accounts of their experiences. Guided by the proposed Multidimensional Intersectional Risk–Capability (MIRC) framework, the analysis used descriptive statistics, chi-square tests, Firth's penalised logistic regression and multinomial logistic regression to examine exposure and response readiness. Reported harassment was experienced by 9.1% of respondents. Respondents described multiple forms of technology-facilitated harassment, including explicitly gendered and disability-targeted harassment. Exposure was 15.7% among women with disabilities compared with 8.6% among women without disabilities. Daily internet use was associated with higher adjusted odds of harassment (OR = 2.36, 95% CI [1.18, 5.33]). The higher pooled exposure in semi-arid settings was substantially influenced by Kilifi, highlighting the importance of county-specific contexts. Digital-safety capability aligned more closely with self-reported readiness to respond than with lower exposure. By connecting incident accounts with intersectional, geographic and digital-participation patterns, the study offers MIRC as an integrative framework and supports accessible, context-sensitive prevention, practical response training and stronger institutional reporting pathways.

Keywords: Technology-Facilitated Gender-Based Violence (TFGBV); Online harassment; Intersectionality; Digital participation; Disability; Digital safety

1. Introduction

Digital participation now mediates economic activity, professional communication, education and civic life, and gender-based violence has extended into the same digital environments that enable this participation (Henry and Powell 2018; Powell and Henry 2019). Technology-facilitated gender-based violence (TFGBV) denotes gender-based violence that digital technologies enable, facilitate, aggravate or amplify, and it encompasses a wide and evolving set of forms such as online harassment and abuse, cyberstalking, digital surveillance and coercive control, image-based abuse and technology-facilitated intimate-partner abuse (Afrouz 2023; Bailey and Burkell 2021; Henry et al. 2020). Digital technologies extend the persistence, reach and intrusiveness of abuse by enabling repeated contact, monitoring and control that are not bounded by physical proximity (Dragiewicz et al. 2018; Woodlock 2017).

Digital participation also creates important opportunities for youth, women and marginalised people to overcome barriers embedded in conventional labour, financial and market systems. Across Africa, improved internet connectivity has been associated with employment growth and expanded economic participation, while digital technologies can strengthen women's participation in formal economic activity and widen opportunities for young people through digital skills and entrepreneurship (Efobi et al. 2018; Hjort and Poulsen 2019; Musuva 2026). For persons with disabilities, digital technologies can expand access to work, services and social participation where accessibility, appropriate skills and inclusive design are in place (Jetha et al. 2023). Safeguarding these spaces is therefore crucial to ensuring that digital transformation narrows existing economic and social gaps instead of reproducing gender bias, violence against women and girls, disability discrimination and other forms of exclusion that can restrict participation among the groups with the most to gain from digital inclusion (Bailey and Burkell 2021; Tyabashe-Phume et al. 2025).

The consequences of TFGBV extend well beyond the abusive encounter. A systematic review of 48 studies of online abuse directed at politically active women found that 81% documented psychological distress, anxiety or fear, and that substantial proportions reported reduced engagement with digital platforms and withdrawal from public life (Koch et al. 2025). Because women and girls are disproportionately targeted, these effects constrain their voice, livelihoods and participation precisely as digital access becomes a precondition for social and economic inclusion (Henry and Powell 2018; Koch et al. 2025).

Available studies suggest substantial exposure to technology facilitated abuse, but prevalence estimates are difficult to compare because studies differ in the forms of violence measured, populations studied and methods used. For example, a meta-analysis focused specifically on technology facilitated sexual violence estimated a pooled prevalence of about 31% among women, although estimates across individual studies ranged from 2% to 84% (Benítez Hidalgo et al. 2025). Another meta-analysis similarly found wide variation in prevalence depending on how technology facilitated abuse was defined and measured (Patel and Roesch 2022). These differences show why findings on one form of abuse should not be treated as representative of TFGBV as a whole. The evidence base is also geographically uneven, with most studies conducted in high income settings and research from low- and middle-income regions concentrated in a limited number of countries and populations (Bansal et al. 2024). The present study's single non-behavioural item is likely to capture a narrower set of self-recognised experiences than behaviourally specific instruments; its 9.1% estimate is therefore not directly comparable with these TFGBV or sexual-violence estimates.

Evidence on TFGBV in sub-Saharan Africa is growing but remains limited and uneven. A recent scoping review identified only 17 eligible studies which are concentrated largely among university populations and in a small number of countries (Tarefa and Abdulai 2026). Recent studies have begun to show that exposure differs across disability, socioeconomic position and other intersecting characteristics, but these patterns remain insufficiently studied across diverse populations and settings (Ned et al. 2026; Tyabashe-Phume et al. 2025). The evidence base therefore remains limited in explaining how individual characteristics, digital participation and geographic context jointly shape TFGBV exposure.

The literature therefore highlights several unresolved dimensions of TFGBV in sub Saharan Africa. Intersectional differences in exposure remain poorly quantified, even though gender

interacts with disability, socioeconomic position and other social locations in shaping vulnerability (Bauer 2014; Ned et al. 2026). Geographic and institutional variation is also insufficiently understood, despite evidence that gender-based violence is produced across individual, community and societal environments (Heise 1998). At the same time, the role of digital safety capability remains unclear, particularly whether skills and resources reduce exposure or mainly strengthen the ability to respond once harm occurs (Helsper 2021). Existing studies rarely examine these processes together or distinguish individual differences from contextual effects.

Kenya provides a particularly informative setting for testing these relationships because its 47 counties encompass substantial variation in structural marginalisation, socioeconomic conditions, infrastructure and digital-economic participation. This enables examination of two potentially interacting aspects: a structural-marginalisation hypothesis, predicting greater TFGBV where established socioeconomic and GBV vulnerabilities are concentrated, and a digital-participation hypothesis, predicting greater exposure where intensive digital engagement creates more opportunities for TFGBV. Existing Kenyan evidence remains concentrated in particular populations, limiting geographically heterogeneous population-level inference.

Against this backdrop, this study draws on data collected by the Green and Digital Innovation Hub (gDIH) under DigiKen, a programme supporting Kenya's digital transformation through digital literacy, entrepreneurship and technology support. The analysis examines three questions: How is reported online harassment patterned across intersecting social positions? Does observed exposure vary with structural marginalisation, digital participation and geographic context? Is digital-safety capability more closely associated with lower exposure or with greater reported capacity to respond to online attacks?

2. Literature Review

TFGBV is increasingly documented across digital social, educational, occupational and economic spaces in sub-Saharan Africa, although the evidence is limited and uneven across countries and populations. A recent scoping review identified only 17 eligible studies, most published between 2019 and 2024 and concentrated among university populations, with cyberharassment, cyberstalking, cyberbullying, digital surveillance and image-based abuse among the recurrent forms reported (Tarefa and Abdulai 2026). Empirical studies nevertheless demonstrate substantial exposure and consequences. Among 444 university students in Ghana, 51.1% reported online harassment or gender-based abuse, 71.6% cyberstalking or digital surveillance, 29.3% non-consensual image sharing and 27.3% online sexual coercion with TFGBV being significantly associated with depression, anxiety, post-traumatic stress symptoms and suicidal behaviour (Kugbey et al. 2026). Study from 300 secondary school learners in KwaZulu Natal, South Africa, similarly identified substantial cyberbullying and TFGBV exposure, with involvement differing by age, gender, grade and school location and associated with anxiety, reduced self esteem, absenteeism and poorer academic performance (Nkwanyana 2026). Among 204 South African women with disabilities, cyberbullying, hacking and hate speech were prominent, with exposure varying across disability type, education, employment and income, indicating that vulnerability is

differentiated across intersecting social and socioeconomic positions as opposed to gender alone (Ned et al. 2026).

Digital participation further complicates these social gradients. Across 48 African countries, greater mobile-phone, internet and broadband penetration was associated with increased formal economic participation among women, demonstrating the expanding role of digital technologies in livelihoods and economic inclusion (Efobi et al. 2018). Yet greater digital participation also increases visibility and interaction within environments in which gendered abuse can occur. Women journalists in Uganda reported sexist attacks, body shaming and character assassination linked to both their professional work and personal expression online, with harassment contributing to self-censorship and withdrawal from digital spaces (Walulya and Selnes 2023). In Namibia, female journalists experienced trolling, sextortion, cyberstalking, doxxing, hacking and non-consensual image abuse at the intersection of gender, profession and public visibility, while institutional and newsroom protections remained weak (Zviyita and Mare 2024). Zimbabwean evidence similarly shows that social media can facilitate awareness, reporting and survivor support while simultaneously enabling perpetrator anonymity and extending gendered abuse (Ndawana and Chisambiro 2024). These findings suggest that digital participation can expand economic and social opportunity while also increasing opportunities for TFGBV exposure (Efobi et al. 2018; Ndawana and Chisambiro 2024; Walulya and Selnes 2023; Zviyita and Mare 2024).

Research also shows that structural marginalisation and TFGBV exposure need not follow identical gradients. Women with disabilities, rural populations, LGBTQI+ groups and low-income populations experience intersecting vulnerabilities, yet a review of 4,738 records found only 43 relevant Low- and Middle-Income Countries (LMIC) studies and none focused exclusively on women with disabilities, illustrating how poorly quantified these intersections remain (Tyabashe-Phume et al. 2025). Age and life stage may constitute an additional dimension of exposure, particularly as younger populations participate intensively in social, educational and economic activities online, yet these relationships remain insufficiently examined alongside gender, disability and socioeconomic position in SSA (Nkwanyana 2026; Tarefa and Abdulai 2026). At the same time, regional TFGBV research remains heavily concentrated in selected universities, occupational groups and specific localities, providing limited evidence on whether observed differences arise from individual social characteristics, digital participation, geographic context or wider institutional conditions (Tarefa and Abdulai 2026). This distinction is important because restricted connectivity and socioeconomic resources can limit both participation in digital environments and access to safety resources, whereas more digitally connected settings may create greater opportunities for exposure through intensified social and economic interaction (Efobi et al. 2018; Tyabashe-Phume et al. 2025).

Capability and response constitute a further unresolved dimension. Studies from Uganda and Namibia show that women experiencing online harassment use blocking, withdrawal, reduced platform participation and self-censorship, while weak organisational and institutional responses constrain effective redress (Walulya and Selnes 2023; Zviyita and Mare 2024). Zimbabwean evidence similarly demonstrates that digital technologies can support reporting, mobilisation and coping after GBV exposure even while facilitating abuse itself (Ndawana and Chisambiro 2024). Among women with disabilities, limited digital literacy, secure technologies and accessible support systems further constrain response and access to justice (Ned et al. 2026; Tyabashe-Phume et al. 2025). The evidence therefore distinguishes being exposed to TFGBV from having the

capability to respond effectively once exposure occurs, while leaving unclear how capability interacts with gender, disability and other social positions.

Thus, the literature identifies three related but insufficiently integrated processes: technology-facilitated violence may be differentiated across intersecting social positions; observed exposure is embedded within geographic, institutional and digital-participation contexts; and capability may shape response without necessarily corresponding to lower exposure (Ned et al. 2026; Tarefa and Abdulai 2026; Tyabashe-Phume et al. 2025). Existing studies rarely examine these processes together. This fragmentation creates the need for a framework that keeps intersectional patterning, exposure context and response capability analytically connected without assuming that they follow the same gradient.

Building on these gaps, we propose the Multidimensional Intersectional Risk–Capability (MIRC) framework as an integrative analytical structure for examining technology-facilitated violence. MIRC draws on intersectionality, socio-ecological thinking and the capability approach while assigning each tradition a distinct analytical role. Intersectionality directs attention to how social positions combine and to patterns that can be obscured in single-category comparisons (Bauer 2014; Bauer et al. 2021; Bowleg 2012; Crenshaw 1989). Socio-ecological perspectives locate harmful encounters within the digital, geographic and institutional environments in which participation occurs (Heise 1998; Henry and Powell 2016, 2018). The capability approach distinguishes exposure from the practical resources and freedoms available to respond once harm occurs (Helsper 2021; Nussbaum 2011; Sen 1999). MIRC makes three linked propositions: aggregate social categories may conceal concentrations within intersecting positions; the contexts associated with observed exposure may not follow the same gradient as structural marginalisation; and response capability may differ from exposure risk. Its empirical value is examined by asking whether these dimensions converge or diverge within the same sample. MIRC is therefore used here as an integrative framework, not as a hierarchical statistical model or a claim of causal sequencing. Kenya’s regulatory and institutional environment has been treated as an outer interpretive context instead of a survey-measured level of analysis. The proposed framework is illustrated in Fig. 1.

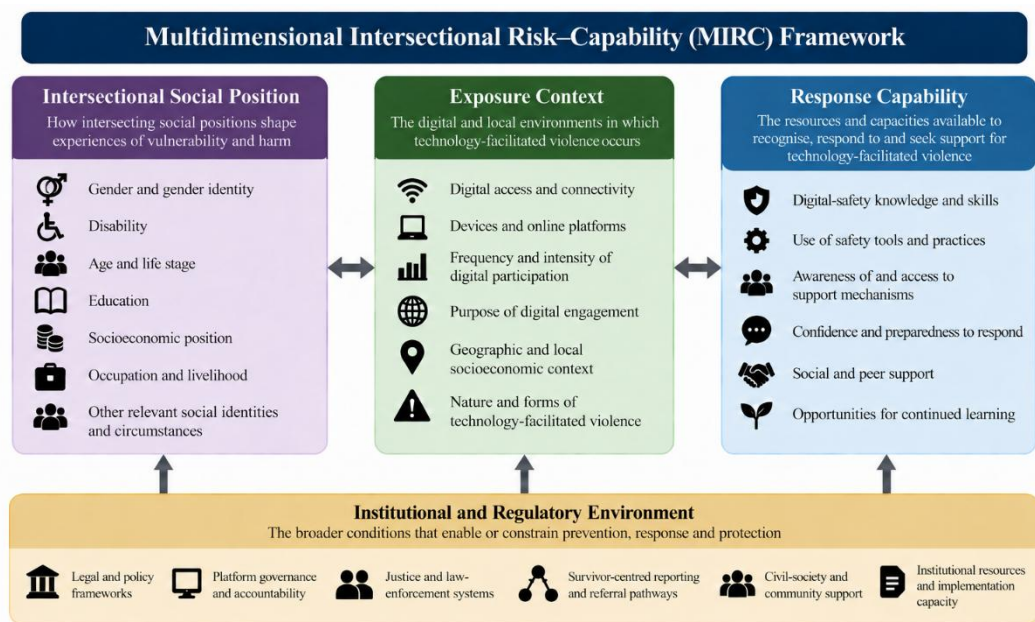


Fig. 1 Multidimensional Intersectional Risk–Capability (MIRC) conceptual framework for examining technology-facilitated gender-based violence.

3. Methodology

3.1 Research design and data source

This study used secondary cross-sectional data from the DigiKen needs assessment implemented by the African Centre for Technology Studies (ACTS) through Green and Digital Innovation Hub (gDIH) through 14 Digital Innovation Hubs in Kenya. The assessment identified digital-skilling and support needs among programme beneficiaries. Data were collected between September and October 2025 using a questionnaire digitised on KoBoToolbox and administered through in-person and telephone interviews by 45 trained Trainers of Trainers affiliated with the participating hubs.

3.2 Participants and sampling

The study included 854 respondents reached through 14 DigiKen Digital Innovation Hubs across 11 Kenyan counties. Each hub conducted beneficiary mapping through community mobilisation within its county, identifying approximately 530 people it intended to support under DigiKen. From these mapped beneficiaries, each hub selected approximately 60 respondents to participate in the needs assessment. The hubs therefore provided a community-based recruitment and programme delivery structure for reaching populations across the participating counties. Thus, sample captures experiences among respondents reached through DigiKen hubs across diverse Kenyan county contexts. Participant characteristics are presented in Table 1.

3.3 Analytical approach

The analysis applied the proposed Multidimensional Intersectional Risk–Capability (MIRC) framework to examine reported online harassment across intersecting social positions, digital and geographic contexts, and response capability. Harassment exposure was measured through a binary self-reported indicator, without a specified recall period, and complemented by open-ended descriptions of respondents' experiences. Of the 78 respondents reporting harassment, 71 provided descriptions, which were reviewed to characterise reported forms and circumstances of technology-facilitated violence, including explicitly gendered and disability-targeted experiences. Intersectional analyses examined selected combinations of gender, age, disability, education and occupation using proportions and Wilson 95% confidence intervals. Geographic context was represented by county and ASAL classification, while digital participation was measured through internet-use frequency and breadth of media-channel participation. Descriptive statistics and chi-square tests examined bivariate associations.

Digital-safety capability combined two self-reported measures of responsible online communication and awareness of online-safety risks. Each was scored from 0 for no reported capability to 2 for reported capability, with intermediate responses scored 1, producing a composite ranging from 0 to 4 ($\alpha = 0.65$). Response readiness comprised three categories reflecting no response knowledge, a need for further training and reported knowledge of how to respond. Multinomial logistic regression examined its association with capability, adjusting for gender, disability and programme group, with no response knowledge as the reference category.

Adjusted correlates of harassment were estimated using Firth's penalised logistic regression, given the relatively small number of exposure events. The model included gender, disability, LNOB and MSME status, daily internet use, and arid and semi-arid classification, with men, respondents without disabilities, other programme respondents, less-than-daily internet users and non-ASAL settings as reference categories. The complete-case model included 787 respondents and 71 harassment events. The remaining 67 respondents lacked internet-use information and were retained in a sensitivity model using a missing-data indicator. Standard logistic regression provided

an additional robustness check, while a separate geographic sensitivity comparison examined the influence of Kilifi on the ASAL findings. Statistical significance was assessed at $p < 0.05$.

3.4 Limitations

Although respondents' accounts documented diverse forms of technology-facilitated violence, including gendered and disability-targeted harassment, the survey did not systematically measure the prevalence of individual TFGBV forms. Small intersectional subgroups limited statistical precision, and geographic comparisons were sensitive to Kilifi's contribution and differences in hub composition. Furthermore, digital-safety capability and response readiness were self-reported and may not reflect demonstrated skills or effective institutional support.

3.5 Ethical considerations

The study received ethical approval from the African Centre for Technology Studies (ACTS) Ethics Review Committee, in accordance with ACTS Policy, ACTS/SOP/003/2019/R/24. Informed consent was obtained from all individual participants included in the study before data collection.

3.6 Data availability

The data that support the findings of this study are available from the corresponding author, EMO upon reasonable request

4. Results

4.1 Study sample and overall exposure

The analytic sample comprised 854 respondents across 14 DigiKen hubs representing 11 county contexts. Participant characteristics are summarised in Table 1. Reported online bullying or harassment was experienced by 9.1% of respondents (95% CI [7.4%, 11.3%]).

Table 1: Participant characteristics

Characteristic	Distribution in analytic sample
Gender	Women 446 (52.2%); Men 408 (47.8%)
Age	Below 18: 6 (0.7%); 18–25: 355 (41.6%); 26–35: 295 (34.5%); Above 35: 198 (23.2%)
Disability	Yes 98 (11.5%); No 756 (88.5%)
Programme group	LNOB 607 (71.1%); MSME 161 (18.9%); Other 86 (10.1%)

The accounts of respondents that reported online bullying or harassment revealed diverse forms of technology-facilitated violence such as abusive and negative comments, insults, mocking, body shaming, account hacking, impersonation using photographs, extortion, scams and attacks on business reputation, hate speech, harassment linked to online business activities, such as discouraging comments about advertised products and misleading comments about product prices. Harassment occurred across social media, messaging platforms and online commercial activities, illustrating how digital spaces used for communication, self-expression and livelihoods can also become sites of abuse.

Other accounts provided further insight into the gendered and disability-related circumstances of harassment. Some described receiving mean comments from boys in a class WhatsApp group after rejecting their advances, while others reported hostile comments from men on posts about women's-rights activism. Other respondents explicitly connected harassment to their disabilities, including derogatory Facebook messages and comments targeting a respondent's disability when

advertising businesses on TikTok. These accounts document how gender, disability and economic participation featured in respondents' experiences of online harassment.

4.2 Geographic variation in exposure

Across the participating county contexts, reported online harassment was 4.6% (95% CI [2.6%, 8.1%]) in arid settings, 8.8% (95% CI [6.3%, 12.1%]) in non-ASAL settings and 13.9% (95% CI [10.2%, 18.8%]) in semi-arid settings. Reported harassment differed significantly across the three geographic classifications ($\chi^2 [2] = 12.96, p = 0.002$).

County-level analysis revealed further variation in reported harassment. Kilifi recorded the highest exposure at 20.5%, followed by Mombasa at 15.9% and Nairobi at 12.5%. West Pokot and Tana River recorded 10.0% and 9.2%, respectively, while the lowest exposure was observed in Mandera at 1.8%, Busia at 3.3%, and Garissa and Isiolo at 3.4% each. Reported harassment differed significantly across counties ($\chi^2 [10] = 40.76, p < 0.001$).

Excluding Kilifi reduced reported exposure in the remaining semi-arid counties to 7.3%, compared with 8.8% in non-ASAL counties. Differences across the three geographic classifications were no longer statistically significant ($\chi^2 [2] = 3.81, p = 0.149$). This finding indicates that Kilifi contributed substantially to the observed semi-arid association, which should therefore be understood as a feature of the sampled county contexts as opposed to evidence of a general relationship between aridity and online harassment. The geographic comparisons are shown in Fig. 2.

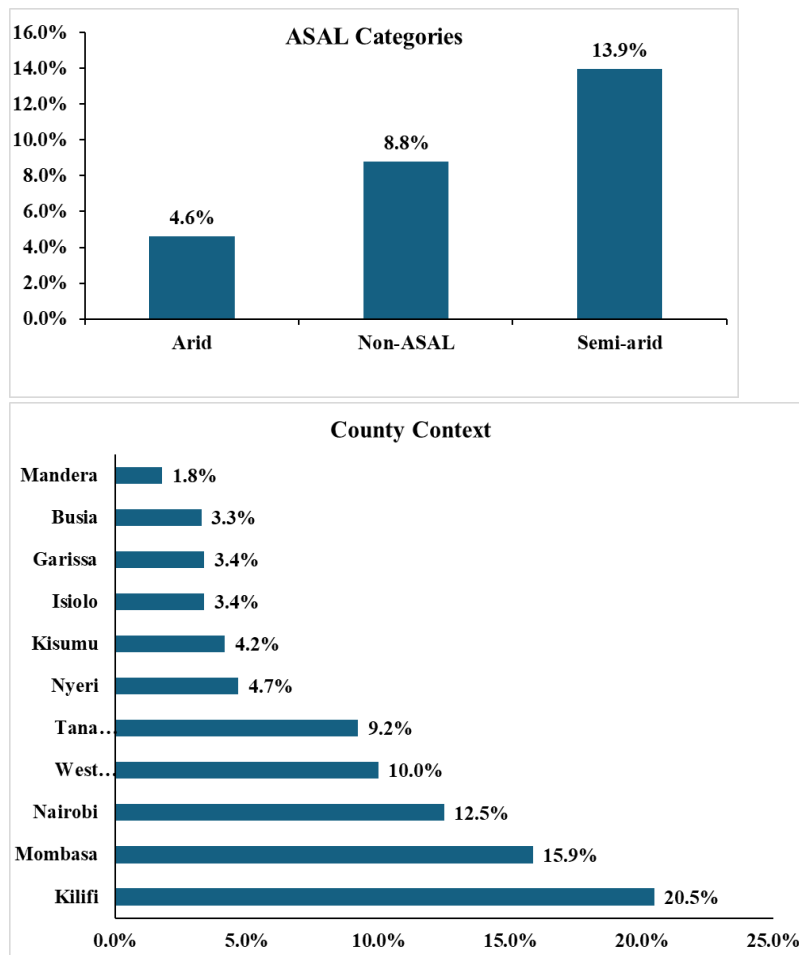


Fig. 2 Reported online harassment across ASAL categories and county contexts.

4.3 Intersecting social positions and reported online harassment

Aggregate exposure was similar among women (9.4%) and men (8.8%), while 11.5% of respondents reported having a disability. Among women with disabilities, 15.7% reported harassment (95% CI [8.2%, 28.0%]), compared with 8.6% of women without disabilities (95% CI [6.2%, 11.8%]), 10.6% of men with disabilities and 8.6% of men without disabilities.

Age and disability cross-classifications are presented in Fig. 3. Among respondents aged 18–35 years, harassment was reported by 14.9% of those with disabilities and 9.5% of those without disabilities. Among respondents older than 35 years, the corresponding proportions were 8.3% and 5.7%.

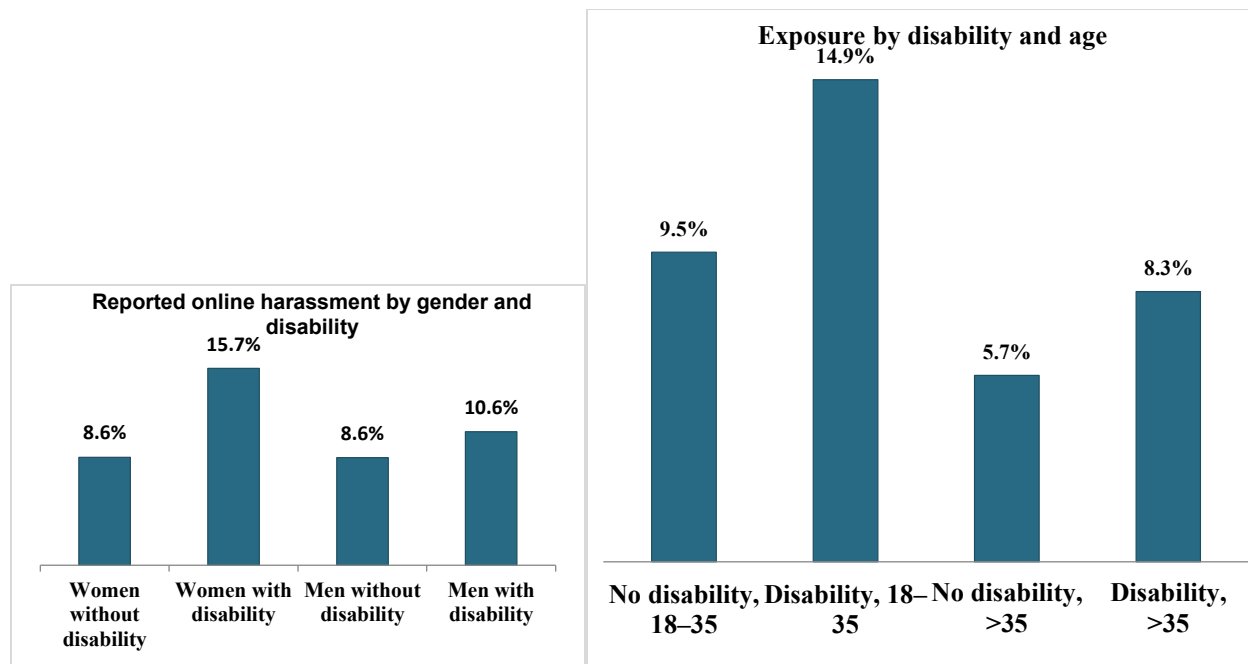


Fig. 3 Reported online harassment across gender–disability and disability–age intersections.

A three-way analysis showed further variation when gender, disability and age were considered together. Among respondents aged 18–35 years, harassment was reported by 15.8% of women with disabilities and 13.9% of men with disabilities, compared with 10.1% of women and 9.0% of men without disabilities. Among respondents older than 35 years, exposure was 15.4% among women with disabilities, 4.3% among women without disabilities and 7.4% among men without disabilities. The full distribution is presented in Fig. 4.

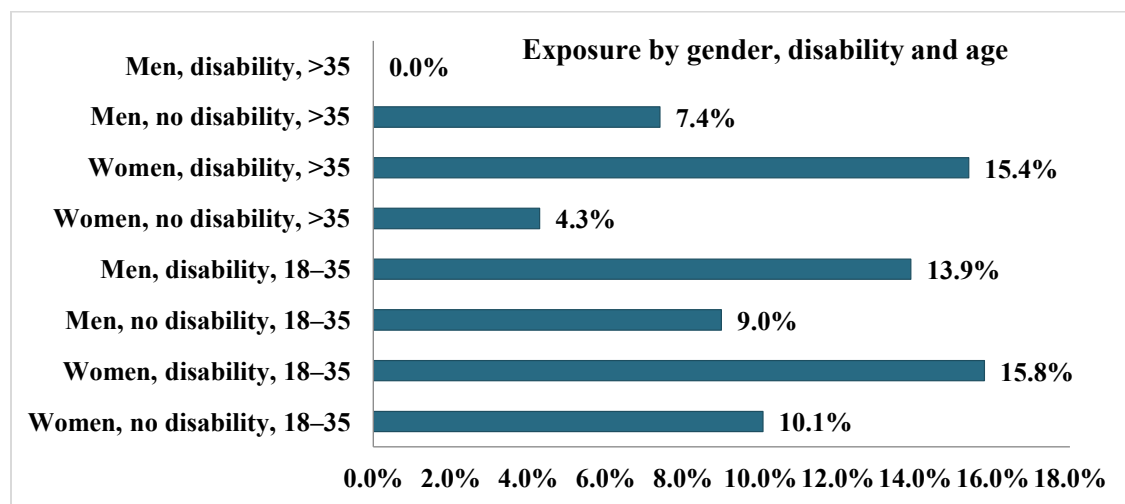


Fig. 4 Exploratory three-way gender, disability and age distribution of reported online harassment

Reported harassment varied by gender and occupation. Among students, exposure was 15.3% for women and 7.4% for men, while formal employment showed 11.8% and 4.8%, respectively. In informal employment, the pattern was reversed, with 14.2% among men and 8.3% among

women. Among respondents with disabilities, exposure was 20.6% at secondary, 20.0% at certificate and 18.8% at university education levels. These occupation and education comparisons are shown in Fig. 5.

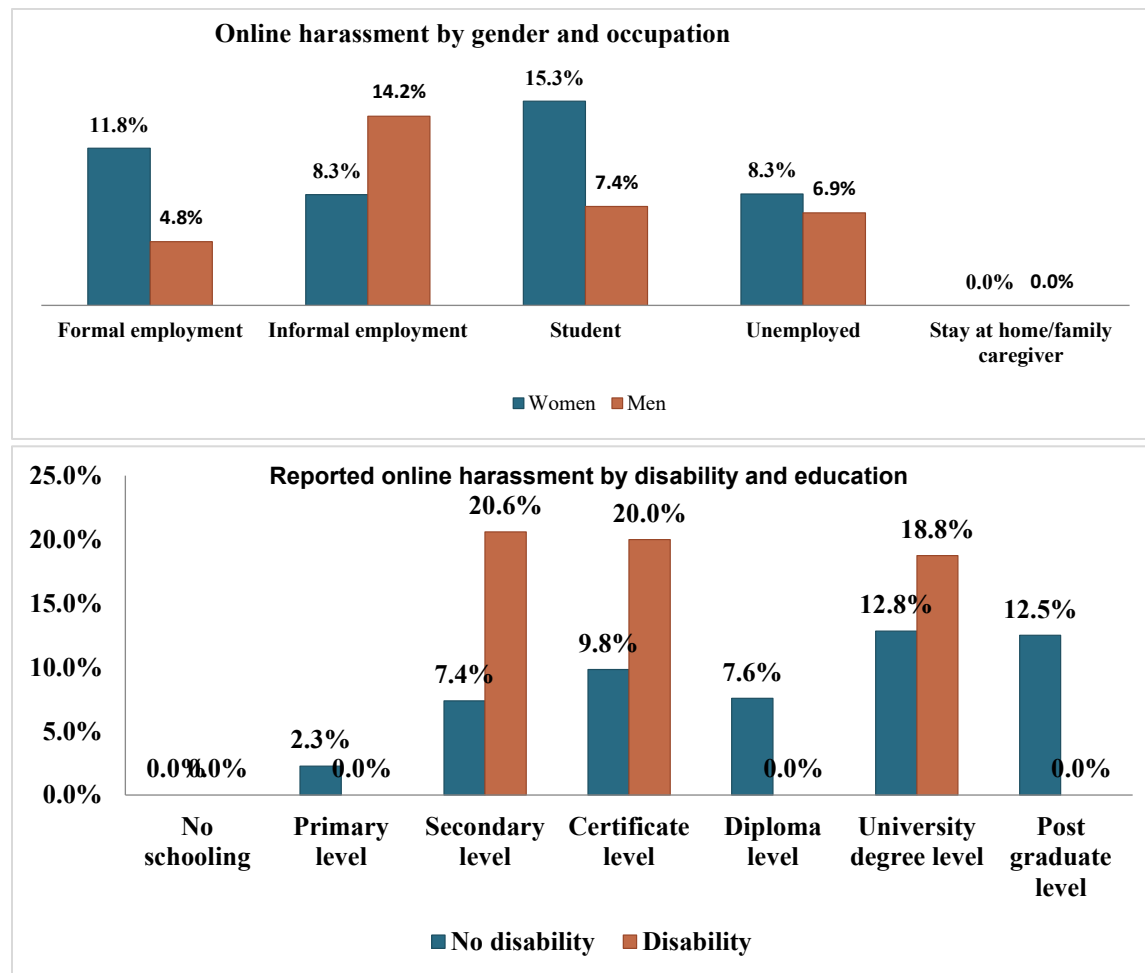


Fig. 5 Exploratory gender–occupation and disability–education distributions of reported online harassment

4.4 Digital participation and media channels

Internet-use frequency showed a 10.2% exposure among respondents who connected to the internet daily compared with 4.8% among those connecting less frequently. The difference was statistically significant ($\chi^2 [1] = 4.62, p = 0.032$). The internet-use comparison is shown in Fig. 6.

Respondents were also asked to select more than one channel that they were familiar with or used for their business or community. WhatsApp was selected most frequently at 93.5%, followed by Facebook at 80.6% and TikTok at 73.2%. YouTube and Instagram were each selected at 53.2% and 52.7%, respectively, while local radio was selected by 19.9% and websites by 14.9%.

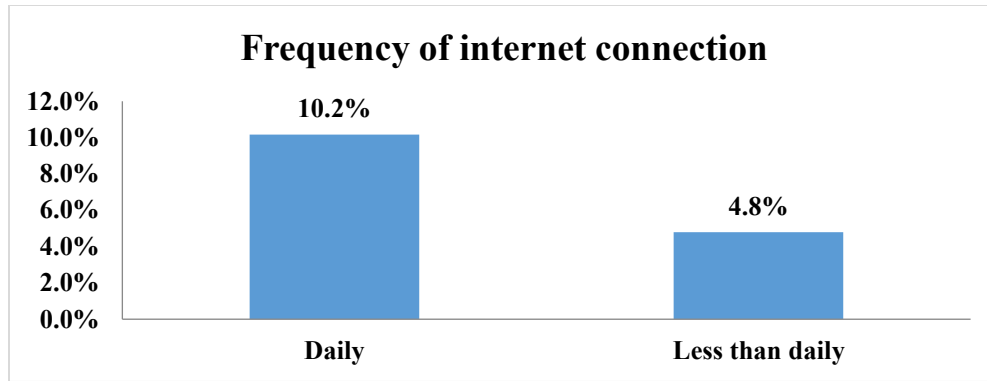


Fig. 6 Reported online harassment by frequency of internet connection.

Among respondents who selected websites as one of the media channels they were familiar with or used for their business or community, 16.2% reported online bullying or harassment. Exposure among respondents selecting the other channels ranged from 8.8% for Facebook to 9.6% for Instagram. TikTok, WhatsApp and YouTube recorded 9.5%, 9.4% and 9.3%, respectively, while local radio recorded 8.9%. Because several channels could be selected by the same respondent, these proportions describe exposure among people participating in each media environment. The media channel-specific estimates are shown in Fig. 7.

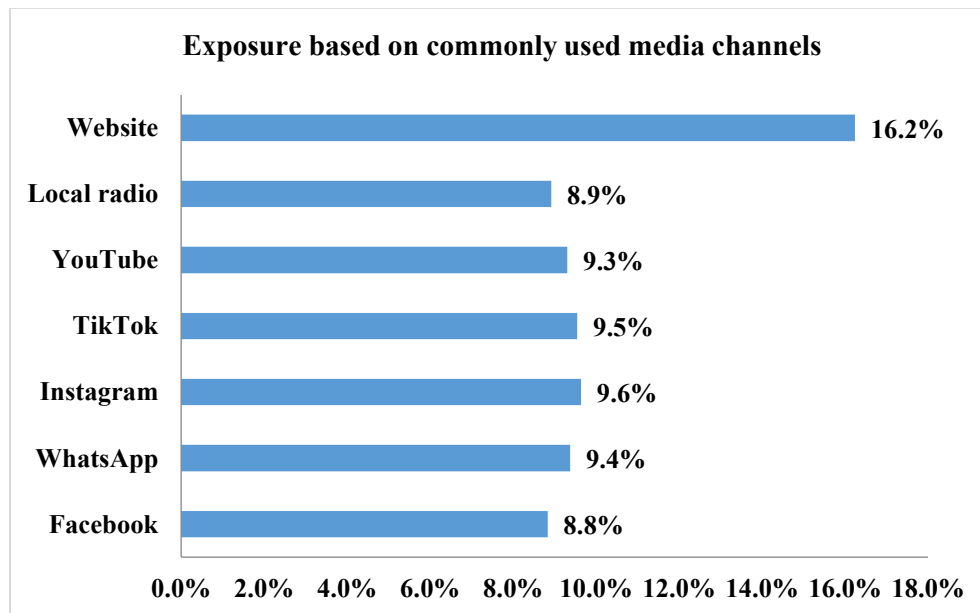


Fig. 7 Reported online harassment among users of selected media channels.

A descriptive gradient was also visible in the breadth of media-channel participation. Exposure was 6.0% among respondents selecting one or two channels, 9.1% among those selecting three or four channels and 10.7% among those selecting five or more channels. This pattern complements the daily internet-use result by showing higher observed exposure among respondents participating across a broader range of media environments. This pattern is shown in Fig. 8.

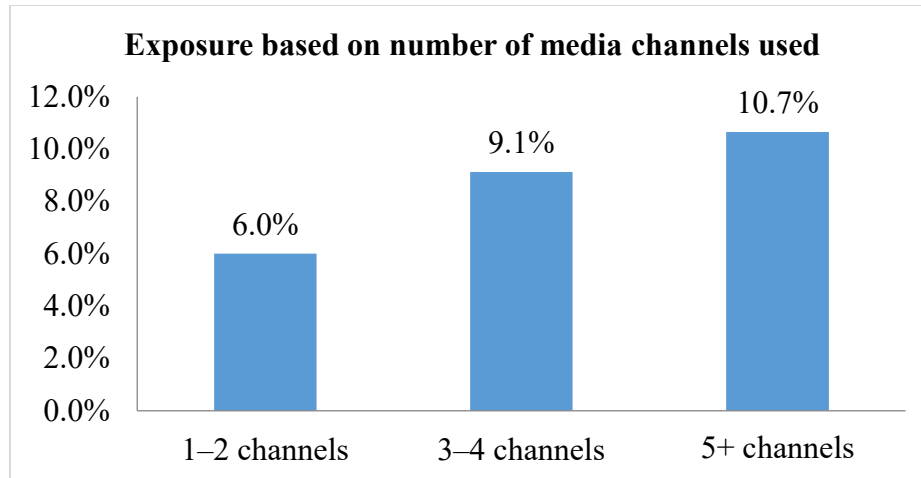


Fig. 8 Reported online harassment by breadth of media-channel participation.

4.5 LNOB and MSME exposure and response

Exposure proportions were broadly comparable across the program target groups, at 8.4% among LNOB respondents, 12.4% among MSME owners and 8.1% among respondents belonging to neither group.

The response item showed a different pattern. A need for training on responding to harassment in the digital spaces was reported by 61.5% of MSME respondents and 56.6% of LNOB respondents, compared with 34.7% of other respondents. Conversely, 48.0% of respondents outside the LNOB and MSME categories reported that they did not know how to respond, compared with 20.9% of LNOB respondents and 18.2% of MSME respondents. Approximately 22.5% of LNOB respondents, 20.3% of MSME respondents and 17.3% of other respondents reported already knowing how to respond. The distribution of response categories differed significantly across the three groups ($\chi^2 [4] = 30.82, p < 0.001$). The programme-group findings are illustrated in Fig. 9.

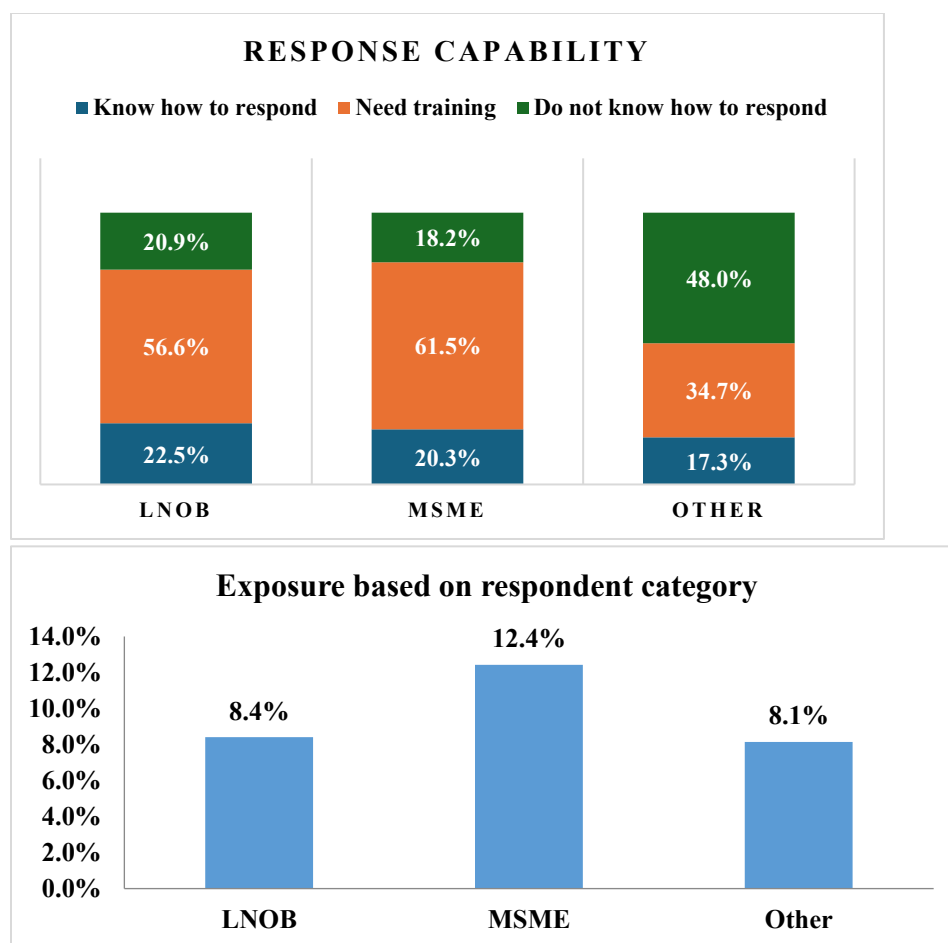


Fig. 9 Reported exposure and response readiness across LNOB, MSME and other respondents.

4.6 Digital-safety capability

Responsible online communication and awareness of online-safety risks did not show a consistent lower-exposure pattern. Exposure was 10.8% among respondents reporting responsible communication skills, 6.0% among those reporting partial skills and 6.2% among those reporting no such skills. Similarly, exposure was 9.7% among respondents reporting online-safety awareness, 9.6% among those reporting partial awareness and 6.9% among those reporting no awareness.

Responsible online communication and online-safety awareness were combined into a self-reported digital-safety score; knowledge of how to respond to an online attack was assessed separately. Higher digital-safety capability was associated with greater response readiness. In the adjusted multinomial model, a one-unit increase in capability was associated with higher odds of identifying a need for further training (OR = 1.33, 95% CI [1.17, 1.53]) and substantially higher odds of reporting knowledge of how to respond to online harassment (OR = 4.36, 95% CI [3.23, 5.87]), compared with reporting no response knowledge. These findings reflect respondents' self-reported capability and preparedness as opposed to demonstrated response skills. The adjusted multinomial regression results are presented in Table 2.

Table 2: Adjusted associations between digital-safety capability and response readiness.

Predictor	Training need vs no response knowledge aOR (95% CI)	<i>p</i>	Knows how to respond vs no response knowledge aOR (95% CI)	<i>p</i>
Digital-safety capability	1.33 [1.17, 1.53]	< 0.001	4.36 [3.23, 5.87]	< 0.001
Women	1.25 [0.87, 1.80]	0.220	1.18 [0.74, 1.89]	0.480
Disability	1.28 [0.73, 2.25]	0.388	0.84 [0.38, 1.84]	0.660
LNOB	3.50 [2.00, 6.10]	< 0.001	2.22 [1.03, 4.79]	0.042
MSME	4.58 [2.34, 8.97]	< 0.001	2.62 [1.05, 6.53]	0.040

4.7 Adjusted correlates of exposure and robustness

The primary adjusted analysis used Firth's penalised logistic regression and included 787 respondents with 71 reported harassment events. Daily internet use was associated with higher odds of reported online harassment compared with less frequent use (OR = 2.36, 95% CI [1.18, 5.33], $p = 0.014$). Respondents in semi-arid counties also had higher odds of reported harassment than those in non-ASAL counties (OR = 1.75, 95% CI [1.01, 3.01], $p = 0.046$), although this association was sensitive to the inclusion of Kilifi. Disability and arid context reached conventional significance thresholds in the complete-case model, but their estimates were close to the threshold and are interpreted cautiously. The primary model estimates are presented in Table 3.

Standard logistic regression produced similar estimates. In the sensitivity analysis retaining all 854 respondents, daily internet use remained associated with higher odds of reported harassment (OR = 2.33, 95% CI [1.16, 5.27], $p = 0.015$), as did semi-arid context (OR = 1.83, 95% CI [1.08, 3.12], $p = 0.026$). The disability and arid estimates retained the same direction but became less precise. Gender, LNOB status and MSME status showed no independent associations after adjustment. We note that given the relatively small number of harassment events and multiple exploratory comparisons, these findings should be interpreted cautiously. The primary adjusted estimates are illustrated in Fig. 10.

Table 3: Primary Firth penalised logistic regression of reported online harassment.

Predictor	OR	95% CI	<i>p</i>
Women	1.11	0.67–1.82	0.692
Disability	2.01	1.02–3.76	0.045
LNOB	0.90	0.40–2.35	0.814
MSME	1.06	0.41–2.98	0.912
Daily internet use	2.36	1.18–5.33	0.014
Arid	0.51	0.24–1.00	0.049

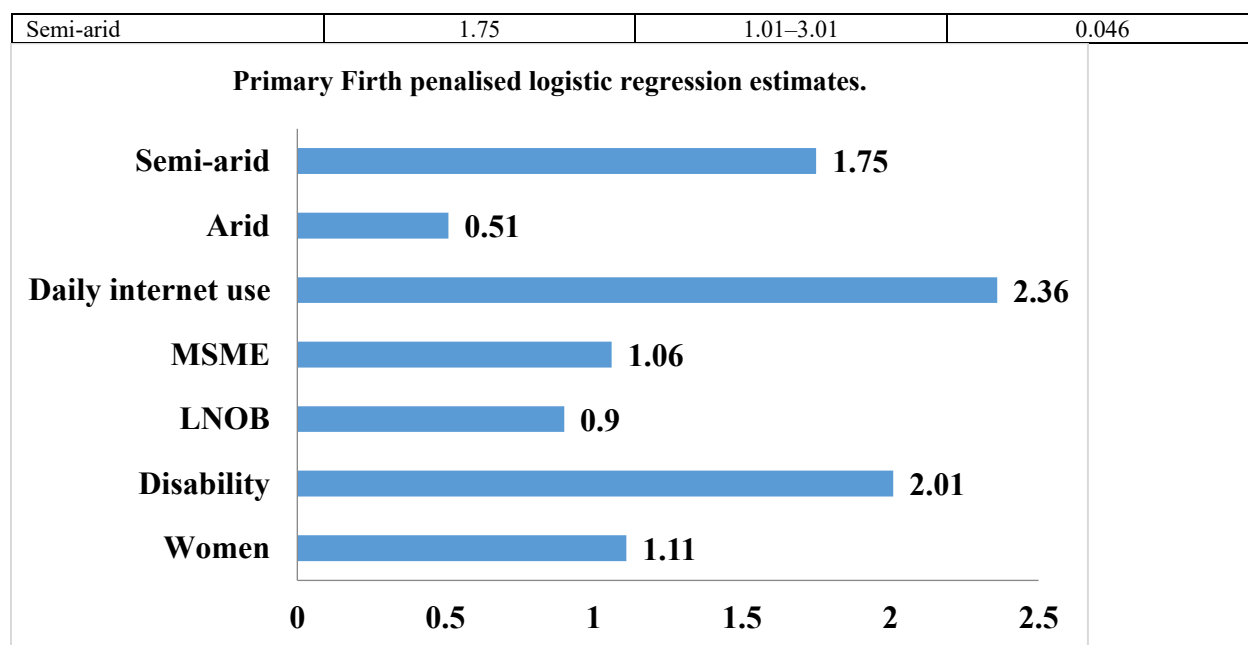


Fig. 10 Primary Firth penalised logistic regression estimates.

5. Discussion

We have interpreted the findings through the three dimensions brought together in the MIRC framework proposed in this study which are intersectional social position, digital and geographic context, and response capability. Kenya's regulatory environment is considered as an outer interpretive context that may shape whether reported response capability can translate into effective protection, it was not directly measured in the survey.

5.1 Intersecting social positions and exposure

The near-equivalence of overall exposure among women and men in the Kenyan sample mirrors the Ghanaian university study by Kugbey et al. (2026), which likewise found no significant sex difference in TFGBV despite high levels of online harassment, cyberstalking, image-based abuse and digital coercion. The Kenyan pattern changed, however, when gender was considered together with disability: exposure rose to 15.7% among women with disabilities, compared with 8.6% among women without disabilities, while men with and without disabilities recorded 10.6% and 8.6%, respectively. This concentration accords with the intersectional concern raised by Tyabashe-Phume et al. (2025), whose LMIC review identifies women with disabilities as an under-studied population situated at the intersection of gender inequality, ableism and broader socioeconomic disadvantage. It is also consistent with the South African evidence of Ned et al. (2026), where TFGBV among women with disabilities varied across age, education, employment, income, province and disability type.

The age–disability breakdown is less precise than the principal gender–disability comparison. Younger respondents with disabilities recorded 14.9% exposure and their peers without disabilities 9.5%, but the confidence intervals overlap. Research on TFGBV among youth is concentrated in selected educational populations (Nkwanyana 2026; Tarefa and Abdulai 2026), and the present sample cannot determine whether the disability pattern differs reliably by life stage.

The principal gender–disability cross-classification illustrates why aggregate categories need not capture every observed concentration, an important concern in intersectionality scholarship (Bauer 2014; Bauer et al. 2021; Crenshaw 1989). Disability-inclusive evidence from South Africa and wider low- and middle-income settings reinforces the value of examining combined social positions while acknowledging substantial heterogeneity (Ned et al. 2026; Tyabashe-Phume et al. 2025).

The incident descriptions give the gender–disability comparison a further, more concrete dimension. Reports of hostile messages after unwanted advances and attacks on women’s-rights advocacy demonstrate that some experiences were explicitly gendered; accounts attributing comments and attacks to disability show that ableist hostility was also present. These experiences connect this study with research describing sexualised and role-based attacks on women who participate visibly online and differentiated abuse among women with disabilities (Ned et al. 2026; Walulya and Selnes 2023; Zviyita and Mare 2024).

5.2 Digital participation and contextual opportunity

Daily internet use was the strongest individual-level correlate of observed exposure, with daily users showing more than twice the adjusted odds, while exposure also rose descriptively with the breadth of media-channel participation, from 6.0% among respondents using one or two channels to 10.7% among those using five or more. This is consistent with the socio-ecological premise that harmful online encounters occur within environments of digital interaction rather than being reducible to individual attributes alone (Heise 1998; Henry and Powell 2018). Studies that measure online activity directly similarly associate time online and patterns of social-media use with cybervictimisation (Franceschi et al. 2024; Gath et al. 2026; Marttila et al. 2021).

The channel-level results index breadth of digital presence and should not be read as platform-specific victimisation statistics. The elevated exposure among website users (16.2%) may mark a more public or business-oriented mode of participation, although the present data do not establish that mechanism. Evidence from women entrepreneurs nevertheless shows that digital engagement can expand market reach while also creating additional points of contact for fraud, abusive interaction and gendered discrimination (James et al. 2026).

The geographic findings suggest that local socioeconomic conditions and digital participation may be more informative than aridity alone. Kilifi and Mombasa, which recorded the highest exposure, have tourism-linked economies where commercial activities may involve substantial online interaction. Nairobi presents a different context, as DigiKen recruitment included informal-settlement communities where socioeconomic disadvantage can coexist with urban digital participation. This is consistent with digital-inequality research showing that structural disadvantage, connectivity and digital outcomes do not necessarily follow the same geographic distribution (Gondwe et al. 2025; Helsper 2012, 2021). Excluding Kilifi reduced harassment exposure in the remaining semi-arid counties to 7.3%, compared with 8.8% in non-ASAL counties, with no significant overall difference ($\chi^2 [2] = 3.81, p = 0.149$). The findings therefore show the importance of county-specific contexts without establishing tourism or other local economic activities as causes of harassment.

5.3 Capability and response

Responsible communication and safety awareness did not show a consistent lower-exposure pattern. The combined two-item score was positively associated with respondents' ratings of their own readiness to respond. Because both variables capture adjacent aspects of self-assessed competence and the composite had modest reliability ($\alpha = 0.65$), the large odds ratio should not be taken as evidence that capability produces effective response. The capability approach remains relevant as a conceptual distinction between resources, freedom to act and achieved outcomes (Helsper 2021; Nussbaum 2011; Sen 1999).

Regional evidence likewise places much digital-safety practice in the response to harm. Women experiencing online abuse have reported blocking perpetrators, reducing participation, self-censoring, reporting incidents and mobilising support after harmful encounters (Ndawana and Chisambiro 2024; Walulya and Selnes 2023; Zviyita and Mare 2024). The present cross-sectional data cannot determine whether capability preceded exposure or developed partly through prior experience, and cannot verify response behaviour. The observed association is best read as alignment between reported safety knowledge and reported preparedness, not as an identified post-exposure pathway.

The structure of the response deficit differed across programme groups. Exposure was comparable across LNOB, MSME and other respondents, yet 56.6% of LNOB and 61.5% of MSME respondents reported a training need while 48.0% of other respondents reported no response knowledge. The coexistence of economic participation with incomplete response capability has also been documented among women digital entrepreneurs (James et al. 2026). Response capability is additionally distinct from response effectiveness because knowing how to block, report or preserve evidence does not establish that platforms or institutions will provide effective redress (Colburn et al. 2023; Macharia et al. 2026).

5.4 Regulation and the conversion of capability into protection

Kenya does not regulate technology-facilitated gender-based violence through a single instrument. Cyber harassment and related cybercrimes are addressed under the Computer Misuse and Cybercrimes Act, including its 2025 amendment; personal-data misuse falls within the Data Protection Act 2019; and electronically mediated abuse within domestic relationships may engage the Protection Against Domestic Violence Act. A 2026 Sexual Offences Amendment Bill also proposes more explicit recognition of forms such as sextortion and manipulated intimate imagery. Recent Kenyan legal analyses therefore describe a framework dispersed across several statutes and not a unified TFGBV law (Amnesty International Kenya 2026; KICTANet 2025).

This dispersion has implications for the conversion of response knowledge into protection. A user may know how to preserve evidence or report an incident yet remain uncertain about the appropriate legal or institutional pathway, while institutional capacity can also limit redress (KICTANet 2025; Macharia et al. 2026). Because national legislation was common across all study settings, the regulatory discussion is interpretive and not an explanation of the geographic associations observed in the survey.

5.5 Implications for the MIRC framework

The intersectional dimension of MIRC is illustrated by the descriptive gender–disability cross-classification, while the uncertainty around small subgroups limits stronger claims. The framework does not depend on treating sparse multi-way categories as established effects. The contextual dimension is illustrated by differences in digital participation and by county variation within

DigiKen. The disappearance of the pooled semi-arid contrast when Kilifi was excluded demonstrates why context should be examined without equating a descriptive geographic category with a verified causal mechanism.

The capability dimension keeps reported harassment separate from reported readiness to respond. Their different descriptive profiles are informative; the close conceptual relationship between the self-report items precludes claims that the model demonstrates an independent or causal capability-to-response pathway.

MIRC is proposed as an organising heuristic, not a statistically validated new theory. It keeps connected but distinct questions visible such as how reported harassment is distributed across social positions, under what participation and local conditions it is observed, and what response readiness people report. These distributions need not coincide within a programme sample. Further research using behaviourally specific outcomes, observed response measures and broader sampling is needed to test whether the distinction generalises.

6. Conclusion and policy recommendations

This study examined how reported online harassment, in the context of technology-facilitated gender-based violence, varied across intersecting social positions, digital participation and geographic contexts, and how digital-safety capability related to response readiness. Respondents' accounts documented varied forms of harm, including explicitly gendered and disability-targeted harassment. Women with disabilities reported higher exposure than women without disabilities. Daily internet use was associated with greater reported exposure, while the semi-arid association was substantially influenced by Kilifi, highlighting the importance of local socioeconomic conditions and digital participation beyond broad geographic classifications. Self-reported digital-safety capability was more closely associated with response readiness than with lower exposure. These findings support the proposed MIRC framework as an approach for examining social position, exposure context and response capability as distinct but interconnected dimensions of TFGBV.

The study contributes to TFGBV research by combining quantitative patterns of reported harassment with respondents' accounts of how harm manifested, revealing gendered and disability-targeted experiences that aggregate estimates alone may obscure. By examining intersecting social positions alongside digital participation, geographic context and response readiness, the proposed MIRC framework offers an integrated approach to understanding how vulnerability, exposure and response capability coexist without assuming a single causal pathway.

The findings show a need for accessible, context-sensitive prevention and response within digital-inclusion programmes. Ministries responsible for gender and ICT, alongside programme implementers, should integrate online-harm prevention into digital literacy and entrepreneurship training, with particular attention to women with disabilities and other marginalised groups. Training should extend beyond awareness to practical skills in recognising harmful encounters, preserving digital evidence and accessing platform and institutional support. Given the gaps in reported response knowledge, programmes should assess demonstrated response skills and the effectiveness of available support instead of relying solely on participants' self-assessments.

Prevention efforts should reflect differences in digital participation and local economic contexts without withdrawing support from less connected communities.

Effective protection also requires institutional arrangements that extend beyond individual capability. National governments should establish accessible reporting and triage pathways that direct survivors to the appropriate legal, psychosocial and technical support services, while strengthening the capacity of police, justice institutions and GBV response systems to handle digital evidence and technology-facilitated abuse. Governments should also establish enforceable platform obligations for accessible reporting, timely responses and transparent complaint-resolution procedures. Regional bodies such as the African Union and its human-rights mechanisms, can support greater consistency in TFGBV definitions, referral standards and platform accountability across jurisdictions.

Besides, stronger measurement is essential for translating these findings into policy action. Governments and research partners should adopt behaviourally specific TFGBV instruments and routinely disaggregate findings by gender, disability, age and geographic context. Such evidence would enable more precise identification of different forms of harm, assessment of interventions and comparison across settings. The MIRC framework offers a basis for connecting this improved evidence with prevention, response and institutional protection without assuming that digital participation, capability and harassment operate through a single causal pathway.

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Author contributions

T.P.M.O. and C.Mb. provided overall leadership and conceptualised the study. E.O. contributed to the study design and coordinated its implementation. E.O., C.Mb., K.O.O., J.R., B.C., C.Mi. and S.O. contributed to data collection. E.O., C.Mb., K.O.O., J.R., B.C., C.Mi., S.O., N.O., A.O. and T.P.M.O. contributed to preparation of the original manuscript. C.Mb., T.P.M.O. and E.O. contributed to resource mobilisation and funding acquisition. All authors reviewed and edited the manuscript, approved the final version and agreed to be accountable for their contributions.

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Competing Interests

No, I declare that the authors have no competing interests as defined by Springer, or other interests that might be perceived to influence the results and/or discussion reported in this paper.

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