



Technology-Facilitated Abuse in Intimate Relationships: A Scoping Review

Michaela M. Rogers¹ , Colleen Fisher², Parveen Ali³ ,
Peter Allmark⁴, and Lisa Fontes⁵

Abstract

Technology-facilitated abuse (TFA) is a significant, harmful phenomenon and emerging trend in intimate partner violence. TFA encompasses a range of behaviours and is facilitated in online spaces (on social media and networking platforms) and through the misuse of everyday technology (e.g. mobile phone misuse, surveillance apps, spyware, surveillance via video cameras and so on). The body of work on TFA in intimate relationships is emerging, and so this scoping review set out to establish what types of abuse, impacts and forms of resistance are reported in current studies. The scoping review examined studies between 2000 and 2020 that focused on TFA within intimate partnerships (adults aged 18+) within the setting of any of these countries: the UK and Ireland, USA, Canada, New Zealand and Australia. The databases MEDLINE, CINAHL and Scopus were searched in December 2020. A total of 22 studies were included in the review. The main findings were that TFA is diverse in its presentation and tactics, but can be typed according to the eight domains of the Duluth Power & Control Wheel. Impacts are not routinely reported across studies but broadly fall into the categories of social, mental health and financial impacts and omnipresence. Similarly, modes of resistance are infrequently reported in studies. In the few studies that described victim/survivor resistance, this was in the context of direct action, access to legal or professional support or in the identification of barriers to resistance.

Keywords

digital coercive control, cyber abuse, cyber harassment, technology-facilitated coercive control

Introduction

Intimate partner violence (IPV) is recognized globally as a serious public health problem which occurs in all settings and among all socioeconomic, religious and cultural groups (World Health Organization (WHO), 2021). IPV includes a wide range of behaviours that can be enacted within an intimate relationship with partners of opposite, same or other gender across the lifecourse (Rogers, 2020). These behaviours include the following: physical abuse (e.g. slapping, punching, strangling, choking, burning, pinching and scratching); psychological abuse (e.g. belittling, criticisms, verbal assaults, shouting and name calling); sexual abuse (e.g. unwanted touching, sexual assault, rape, forced pornography use, forced sex work or sexual activity with others); and financial abuse (e.g. taking and controlling money, not allowing a victim to work or building up debts in their name) (WHO, 2021). IPV also includes coercive control which is a pattern of actions including humiliation, intimidation, isolation, stalking, punishments and restricting access to health care or education (Stark, 2007). Global estimates suggest that one in three women experience IPV in their lifetime (WHO, 2021). IPV can lead to significant harm with extensive consequences ranging from impacts to a person's physical and mental health to economic, employment, social and behavioural effects and, in some cases, IPV can have a fatal outcome (WHO, 2021).

Briggs (2018) notes a growing trend in the use of digital and communications technology to control and abuse intimate partners. Examples include incessant texting or calling, use of surveillance apps, spyware or other tracking devices as well as the perpetration of abuse over social media and networking platforms. The so-called Internet of Things which includes smart home technology (such as home assistants and home thermostats) can also be used to harass and abuse (Tanczer, 2020). These practices are commonly referred to as technology-facilitated abuse (TFA). However, a diverse range of terminology and definitions are in operation across the literature, and Messing et al. (2020) argue that we need a clearer framework (including agreed definitions and measurements) to better understand TFA.

¹The University of Sheffield, Sheffield, UK

²University of Western Australia, Crawley, AU-WA, Australia

³The University of Sheffield and Doncaster and Bassetlaw Teaching Hospitals, Sheffield, UK

⁴The University of Sheffield, Sheffield, UK

⁵University of Massachusetts Amherst, Amherst, MA, USA

Corresponding Author:

Michaela M. Rogers, Senior Lecturer in Social Work, Department of Sociological Studies, The University of Sheffield, Sheffield S10 2TU, UK.
Email: m.rogers@sheffield.ac.uk

Notwithstanding this lack of an agreed framework, TFA has become more visible as the expansion of digital and communication technology has created an arena in which established forms of abuse, such as surveillance or harassment, are being more frequently reported in research. When enacted within the context of an intimate relationship, TFA is a subset of IPV. While TFA can be perpetrated by family members, strangers and acquaintances, this scoping review focuses on TFA perpetrated within the context of an intimate partnership when perpetrated by current or former partners.

The expansion of digital technology has created new possibilities, such as disrupting someone's life through hacking into their home networks or covertly installing spyware in personal devices and domestic spaces. TFA transcends the boundaries of proximity and temporality which can impede abuse perpetrated in the physical world (in-person IPV) as abuse is carried out with greater ease in digital spaces (Woodlock, 2017). Importantly, victims/survivors can use technology to *resist* abuse. The purpose of this scoping review is, broadly, to establish what is known about TFA as well as the methods used by victims/survivors to resist it (Munn et al., 2018). Our focus on resistance differs from existing literature which mostly seeks to describe forms of TFA and its consequences (Afrouz, 2021).

Whilst there is a large body of evidence detailing IPV when enacted in-person, there is much less evidence that examines abuse that is facilitated virtually through technology. Scholarly concern about TFA has been building since 2002 in Australia, the USA and the UK (Laxton, 2014; Woodlock et al., 2020). Subsequently, studies on in-person abuse and TFA are drawing attention to ongoing changes in relationship practices as the co-occurrence of TFA and other behaviours are increasing (Duerksen & Woodin, 2019). For example, a study in Spain reported that 35.8% of female and 26.5% of male university students reported being a victim and a perpetrator of TFA at the same time (Villora et al., 2019). Briggs (2018) describes the use of technology as an emerging trend in IPV.

Due to the increased availability and development of both digital devices and technological capabilities, measuring prevalence is particularly challenging (Stonard, 2021). However, research on TFA prevalence describes it as widespread. For instance, a recent study conducted by the Economist Intelligence Unit (2021) of women ($n = 4500$), in 45 countries with the largest online populations, has shown that: 38% of women have personally experienced online violence; and 85% of women have witnessed online violence being perpetrated against another woman. A UK-based survey of victims/survivors ($n = 307$) found that 45% reported TFA during their relationship and 48% had experienced some form of TFA post-separation (Laxton et al., 2014). In the USA, Marganski and Melander (2018) found that 75% of 540 college students in their sample had experienced TFA perpetrated by a partner or former partner.

Australian national research, undertaken by the eSafety Commissioner, found that 63% of women in the study (total $n = 4122$) experienced image-based abuse (e.g. the non-consensual sharing of sexual images) perpetrated by their current partner (12%) or an ex-partner (13%) (Office of the e-Safety Commissioner, 2017). Clearly, TFA is a harmful and widespread new form of TFA but the wide variation in these statistics highlights that the picture that we have of TFA in its various forms, and in relation to prevalence, impacts and responses, is still unclear.

Aim and Research Questions

The primary aim of the review is to identify and synthesize a broad, but not exhaustive, range of studies exploring TFA in intimate partner relationships and the methods used to resist such abuse. The scoping review questions are:

1. what is known about TFA in intimate relationships? and,
2. what methods are used to resist TFA by victims/survivors?

Method

Scoping reviews are a growing methodology (Pham et al., 2014) which are useful in addressing broad research questions and when mapping key concepts that are reported in or underpin a varied range of studies (Arksey & O'Malley, 2007). For this review, we adopted the PRISMA framework which is an established format for undertaking and reporting scoping reviews (Tricco et al., 2018). The protocol was developed by the research team and registered at the Open Science Framework on 20/11/2020 [<https://osf.io/t56my/>].

Study Eligibility

The Inclusion Criteria were the following:

- Population: Victims/survivors of technology-facilitated abuse; adults aged 18+;
- Concept: technology-facilitated abuse when perpetrated within the context of an intimate relationship;
- Context: UK or countries with some shared cultural background – the UK and Ireland, USA, Canada, New Zealand and Australia;
- Type of sources: primary research and case studies published in peer-reviewed journals;
- English language only; translation resources were not available for this project;
- Date: From 2000 to the search dates in December 2020.

Studies were excluded if it was not clear that the perpetration of TFA was in the context of a current or former intimate relationship. They were also excluded if samples included a majority of victims/survivors under 18 years.

Table 1. Search terms.

Construct	MeSH	Non-MeSH
Relating to abuse	Battered women Domestic abuse Domestic violence Intimate partner violence Spouse abuse Stalking	Coercion and control Coercive control Cyber aggression Cyber harassment Cyberstalking Cyberviolence Digital violence Doxxing/Doxing Family violence Flaming Gender-based violence Identity theft Online harassment Revenge pornography Sextortion Spousal assault Trolling
Relating to technology	Information technology Internet Internet of things ICT	Cell phone use Digital media Mobile phone use Screenloggers Social media Social networking Surveillance Spyware

Study Selection and Data Extraction

The searches took place in December 2020 of the databases MEDLINE, CINAHL and Scopus. Keywords from relevant articles were reviewed to inform the search strategy. The search terms used combined MeSH and non-MeSH terms (see [Table 1](#)).

Two additional searches were performed as a check following the search of bibliographic databases. First, Google Scholar was searched using the terms ‘Information technology’ OR ‘Internet’ OR ‘Internet of things’ OR ‘ICT’ AND ‘Intimate partner violence’. The first 1000 items returned were checked for additional relevant articles not found by the main search. Second, the findings of any relevant literature reviews uncovered during the search were checked for potential additional material meeting our search criteria.

After removal of duplicates, the articles were checked by title and abstract; those not excluded by this stage were obtained as full text. Working in pairs, researchers independently read full texts to include those that met the inclusion criteria. After reconciling differences, reasons for exclusion were recorded. For the final set of included reports, an extraction table was developed (using Excel) to record key information, such as author and key findings (see [Tables 2](#) and [3](#) below). The papers were assessed using the relevant section of the Mixed Methods Appraisal Tool (MMAT version 2018).¹ No formal exclusion criteria were set using this tool; instead, it

was used for an informed judgement of whether or not the paper was of such poor quality that it should not be included. Of the papers in the final selection group of 73, only one was excluded on this basis. The findings entered onto the extraction table were analyzed using computer-assisted qualitative data analysis software, NVivo (version 12).

Selection of Sources of Evidence

As noted, we adopted the PRISMA framework in conducting and reporting this scoping review: see [Figure 1](#) which shows the selection of evidence ([Tricco et al., 2018](#)). Our searches identified 2404 papers following removal of duplicates. These were initially screened and 2273 were removed on the basis of title or abstract. Amongst these were 26 review articles of some relevance whose citations were checked against our results.

One hundred thirty one articles were retrieved as full text plus 24 additional citations identified from the review articles (155 in total). Of these, 82 were excluded; some abstracts contained sufficient material for exclusion but were only available with the full text. Seventy three articles were assessed for eligibility. Fifty one were excluded: 17 were not primary research; 31 did not contain relevant material; and 3 did not contain material from the included nations. This left 22 articles included in the review: [Table 2](#) provides a summary of included studies.

Table 2. Summary of studies included in the review.

Study/Country	N	Study Design	Aim/Question	Outcomes Measured and Themes Identified
Bond and Tyrrell (2018), UK	(N = 783) Police officers	Survey	Understanding the knowledge of and response to revenge pornography	Data on policy knowledge; training opportunities; experience of recent pornography cases; knowledge of victim impact and victim support
Carlson et al. (2019), USA	(N = 138) College students in a dating relationship, aged 18–25	Survey	Four questions concerning perceptions of and responses to the use of technology in abusive relationships	Descriptive statistics were used to examine the relationships between stress, IPV and technology
Carlyle et al. (2019), USA	(N = 700) Instagram posts	Instagram posts using quantitative content analysis	(1) What are the ways in which IPV messages on Instagram reflect public health understandings of, and approaches to prevention? (2) How do Instagram users engage with these posts?	Instagram posts were analyzed for public health understandings of, and approaches to, prevention of IPV, including that of TFA
Douglas et al. (2019), Australia	(N = 55) IPV survivors	Interviews	The study explored survivor's experiences of TFA over 3 years at 3 different times	Interviews with victims/survivors explored their experiences
Duerksen and Woodin (2019), Canada	(N = 278) Young adults	Survey	The study examined the importance of technology use, technological disinhibition and in-person IPV perpetration in predicting tIPV perpetration	Participants reported on their IPV perpetration, technology use and technological disinhibition
Eaton (2020), USA	(N = 366) Newspaper articles	Document analysis	To what extent do the tactics of non-consensual porn in intimate relationships correlate with those set out in Duluth's Power and Control Wheel?	This analysis established that NCP has been perpetrated using all eight of the abuse meta tactics in the Power and Control Wheel, with the three most common being emotional abuse, coercion and threats and denial/blame/minimization
Freed et al. (2018) USA	(N = 39) IPV survivors and (N = 50) professionals	Focus groups with survivors and interviews with professionals	How abusers in intimate partner violence (IPV) contexts exploit technologies to intimidate, threaten, monitor, impersonate, harass or otherwise harm their victims	Focus groups revealed numerous ways in which abusers in IPV exploit technology both through illicit access to private accounts and licit access to social media
Freed et al. (2019), USA	(N = 31) IPV survivors	Interviews	To understand victims'/survivors' experience with and reactions to consultations designed to assist them	Thematic analysis uncovered important security vulnerabilities that survivors were unaware of as well as revealing a broad range of TFA.
Havard and Lefevre (2020), UK	(N = 12) female survivors	In-depth interviews	The study explored mobile phone use in DVA using the Power & Control Wheel as a tool for analysis	Some phone-mediated abuse strategies identified in this research correspond with those established through the Duluth model, the Power and Control Wheel does not yet account for the agile technological surveillance that mobile phones afford, which transcends boundaries of physical location (cf. Eaton 2020)
Henry & Flynn (2019), Australia	(N = 77) online websites	Website postings analysis	To investigate the nature and scope of image-based sexual abuse (IBSA) material on high-volume online websites	Explores the extent to which IBSA is targeted revenge against a former partner versus other ends, such as sexual gratification and proving masculinity
Leitão, 2019a, UK	Various combination of small numbers of survivors and support workers	Interviews, forum data and workshops	Compares TFA in the UK with that found in Australia and the concerns of victims/survivors and support workers	Qualitative data reported under a number of themes, including in particular a focus on smart home devices
Marganski and Melander (2018), USA	(N = 540) College students in dating relationship. Average age, 19	Survey	What is the extent of cyber aggression and victimization in intimate relationships? What is its co-occurrence with psychological, physical and sexual partner violence?	Survey reports levels of cyber IPV and of in-person IPV. A number of hypotheses are tested with the data
Melander (2010), USA	(N = 39) in five focus groups, college students	Focus groups	Exploring the knowledge and beliefs of young adults concerning intimate partner cyber harassment	Using an existing typology of violence four types of threatening behaviour in cyberspace were noted: situational couple violence, intimate terrorism, mutual violent control and violent resistance
Melander and Marganski (2020), USA	(N = 540) Young adults	Survey	What are the nature and effects of cyber versus in-person intimate partner violence (C-IPV and IP-IPV)?	Both C-IPV and I-IPV have harmful sequelae such as depression, substance misuse and antisocial behaviour; C-IPV is linked to more forms of maladaptive behaviour in some cases.

(continued)

Table 2. (continued)

Study/Country	N	Study Design	Aim/Question	Outcomes Measured and Themes Identified
Powell and Hendry (2019), Australia	(N = 2956) Australian adults	Survey	What is the nature and extent of digital harassment and abuse of adults	Lifetime TFSV victimization for men and women; types of TFSV; gender and/or sexuality-based harassment
Powell et al. (2020), Australia and UK	(N = 372) sexually diverse = 282, gender diverse = 90	Survey	What is the nature and extent of digital harassment and abuse of sexually or gender diverse adults	The prevalence of polyvictimization with several types of TFA across a range of groups
Powell and Henry (2018), Australia	(N = 30) Police, legal services and domestic and sexual violence sector providers	Interview study	To explore police attitudes and responses to sexual violence, including that facilitated by technology	The technology-facilitated sexual violence (TFSV) covered was online sexual harassment, cyberstalking, image-based sexual exploitation and coercion to perform unwanted sexual act
Ross et al. (2019), USA	(N = 885) Undergraduates (301 men and 584 women)	Survey	Is sexting coercion a cumulative risk factor for psychological, sexual and attachment problems?	Outcomes measured included number coerced into sexting plus type of activity and breakdown by subgroup
Walker et al. (2019), UK	(N = 391) 321 females, 70 males – undergraduate students	Survey	What is the prevalence and nature of non-consensual digital sharing of sexually explicit material?	Proportion of sample that had perpetrated and been victims of non-consensual digital sharing of sexual material; reasons for perpetration; reactions to perpetration.
Woodlock (2015), Australia	As Woodlock 2017 and 2020, Australia	Survey	Is technology-facilitated stalking is an issue for women experiencing domestic violence and (b) whether mobile technologies (such as smartphones) present further opportunities for the perpetration of stalking and domestic violence against women?	Methods included messaging, tracking, reading confidential messages, sharing private photographs and videos and impersonation. Themes of omnipresence, isolation and punishment and humiliation.
Woodlock (2017), Australia	(N = 198) 152 Domestic violence practitioners and 46 victims	Survey	As Woodlock 2015	As Woodlock 2015
Woodlock et al. (2020), Australia	(N = 546) DV practitioners	Survey	How do perpetrators of DV use digital technology as part of their abuse tactics?	Introduces notion of digital coercive control (DCC). Survey of 546 practitioners. Most common technology used was texting, then Facebook. Themes identified included omnipresence, isolation and ostracism. 'Switching off' as a defensive tactic was problematic as the women cease to be contactable. Victim blaming by authorities noted

Results

Synthesis of Findings

This scoping review focused on TFA in intimate relationships and results are presented under the following main headings: types of TFA in intimate relationships; the impact of TFA; resistance to TFA in intimate relationships; and implications for policy and research.

Types of TFA in Intimate Relationships

Several authors categorized abuse using pre-existing frameworks, including: a social ecological model (Carlyle et al., 2019); Johnson (2010) typology (Melander, 2010); the Women's Experience of Battering framework (Melander & Marganski, 2020); and the Duluth Power and Control Wheel (Pence & Paymar, 1993). The latter is adopted in several included studies (Marganski & Melander, 2018; Eaton, 2020; Melander & Marganski, 2020). It lists eight categories of power and control (or 'spokes of the wheel') used within

relationships including: i) emotional abuse; ii) intimidation; iii) denial, blame and minimization; iv) using male privilege; v) economic control; vi) coercion and threats; vii) using children; and viii) isolation. In a document analysis of 366 newspapers articles published between 2012 and 2017, Eaton (2020) used this framework to categorize TFA finding that seven of the eight categories appear frequently in combination. Table 3 illustrates the way the technologies reported in the included studies mapped to the eight categories of the Duluth Power & Control Wheel (Pence & Paymar, 1993).

Table 3 shows the reported technology used for IPV in the studies examined and abuse perpetrated via mobile telephone and social media usage were the most widely cited, with GPS and hacking technology also frequently used. For example, in Woodlock's (2015) study the most common was the smartphone, followed by social media (which can, of course, be accessed via smartphone). More sophisticated use of technology, such as GPS tracking and hacking into bank accounts, was also reported.

Abuse was often described broadly in accordance within a pattern of coercive and controlling behaviour including:

Table 3. Summary of how technologies are used.

Study/Country	Types of TFA			Duluth Power & Control Wheel i) Emotional abuse ii) Intimidation iii) Denial, blame and minimization iv) Using male privilege v) Economic control vi) Coercion and threats vii) Using children viii) Isolation
	Mobile phone – direct	Social Media (by mobile phone, tablet and PC)	Other technology (IoT, smart home technology and cameras)	
Bond and Tyrrell (2018), UK	Image-based abuse (non-consensual pornography)	Image-based abuse (non-consensual pornography)	N/A	I
Carlson et al. (2015), USA	Monitoring whereabouts, controlling behaviour, humiliation	Monitoring whereabouts, controlling behaviour, humiliation	N/A	i, ii, iii,vi
Carlyle et al. (2019), USA	NA	Cutting off access to social media	NA	viii
Douglas et al. (2019), Australia	Texting, multiple calling, image-based abuse (sending embarrassing photographs), monitoring whereabouts/use of GPS, controlled/destroyed/deactivated devices and accounts	Harassment and monitoring via email and social media, denying access to Facebook and other social media, hacking or monitoring use of PC, changing passwords and accounts, control of online banking and bank accounts, image-based abuse (non-consensual pornography)	Hacking or secret installation of CCTV, GPS tracking, image-based abuse (covert filming of sexual activity), use of children's devices (spyware in toys and mobile phones), installation of night vision cameras	i, ii, v, vi, viii
Duerksen and Woodin (2019), Canada	N/A	Posting hurtful or humiliating comments publicly on social media	N/A	I
Eaton (2020), USA	Image-based abuse (non-consensual pornography (revenge porn) to enact emotional abuse (to humiliate, sending to friends and family), coercion and threats (threatening to sexual images/videos, use of images to extort or coerce the victim to engage in unwanted sex acts or confess), and in denial or blaming action (making light of the abuse, denying that they shared images, implying the victim deserved it)	Non-consensual pornography (revenge porn) to enact emotional abuse (to humiliate, sending to friends and family), coercion and threats (threatening to sexual images/videos, use of images to extort or coerce the victim to engage in unwanted sex acts or confess) and in denial or blaming action (making light of the abuse, denying that they shared images, implying the victim deserved it)	N/A	i, ii, iii, vi, viii
Freed et al. (2018), USA	Taking ownership of accounts or device, misuse of children's devices, compromising devices or accounts (spyware), monitoring whereabouts, stealing/deleting data, texting, calling, exposure-based harms (revealing sensitive information or images, blackmailing texts/calls)	Restricting access to accounts or devices, compromising devices or accounts (forced to share passwords, hacking security questions/passwords, stealing/deleting data and impersonation), harassment or intimidation through messages (e.g. fake Facebook account, harass victim's family or friends), exposure-based harms (revealing sensitive information or images, doxing, non-consensual pornography, creation of fake profiles)	N/A	i, ii, iii, iv, v, vi, vii, viii
Freed et al. (2019), USA	Monitoring whereabouts (spyware and stalkerware), hacking accounts, harassing via spoof phone numbers, shared family plans enabling monitoring	Hacked accounts and social media profiles, browser extensions/spyware enabling monitoring and tracking of browser activity		i, ii, iv, vi
Havard and Lefevre (2020), UK	Monitoring whereabouts, intimidation through abusive/offensive texting/calls (texts with photo of perpetrator outside victim's home), destruction or control of phones to isolate, sending images of perpetrator's self-harming behaviour, misuse of children's devices and social media accounts, economic abuse, phone-mediated coercion (asking for access to phone to evidence 'trust')	N/A	N/A	i, ii, iii, iv, v, vi, vii, viii

(continued)

Table 3. (continued)

Study/Country	Types of TFA			Duluth Power & Control Wheel i) Emotional abuse ii) Intimidation iii) Denial, blame and minimization iv) Using male privilege v) Economic control vi) Coercion and threats vii) Using children viii) Isolation
	Mobile phone – direct	Social Media (by mobile phone, tablet and PC)	Other technology (IoT, smart home technology and cameras)	
Henry and Flynn (2019) Australia	Image-based sexual abuse (non-consensual pornography, sextortion), posts on porn sites and blogging platforms	Image-based sexual abuse (non-consensual pornography, sextortion), posts on porn sites and blogging platforms	N/A	i, ii, iv, v
Leitão (2019)b, UK	Monitoring whereabouts, use of spyware and stalkerware	Monitoring whereabouts and activity, control of accounts, use of spyware and stalkerware, non-consensual pornography	N/A	i, ii, iv, viii
Marganski and Melander (2018), USA	Checking texts, monitoring whereabouts, texts	Changing victim's relationship status, taunting via social network, spreading rumours or lies, sent upsetting images (e.g. porn), distribution (or threats to distribute) data without consent	NA	i, ii, vi, viii
Melander (2010), USA	Texting, monitoring whereabouts	Posting incriminating videos and photos, involving others in intimate disputes, monitoring whereabouts	GPS monitoring	i, iii, iv, vi
Melander and Marganski (2020), USA	Checking texts, monitoring whereabouts, texting	Changing victim's relationship status, taunting via social network, spreading rumours or lies, sent upsetting images (e.g. porn), distribution (or threats to distribute) data without consent	NA	i, ii, vi
Powell et al. (2019), Australia	Texting	Distribution (or threats to distribute) data without consent, sharing of private details with others, spreading rumours or lies, repeated unwanted requests for sexual contact, online posting of unwanted sexual experience, posted offensive messages about gender or sexuality, use of avatar or game character to represent sexual act against you	NA	i, ii, iv, vi
Powell et al. (2020), Australia and UK	Texting	Distribution (or threats to distribute) data without consent, doxing, spreading rumours or lies, repeated unwanted requests for sexual contact, online posting of unwanted sexual experience, posted offensive messages about gender or sexuality, use of avatar or game character to represent sexual act against you	NA	i, ii, iv, vi
Powell and Henry (2018), Australia	Texting, checking texts, monitoring whereabouts, sexting	Threats in public messages, impersonation, distribution (or threats to distribute) of data without consent, repeated and unwanted requests for sexual contact	GPS monitoring	i, ii, vi
Ross et al. (2019), USA	Sexting	NA	NA	i, iv vi
Walker et al. (2019), UK	NA	Distribution (or threats to distribute) of data without consent, sharing of private details with others	NA	i, ii, vi
Woodlock (2015), (2017) and (2020): Australia	Texting, checking texts, monitoring whereabouts, sexting	Monitoring whereabouts, distribution (or threats to distribute) data without consent, doxing	GPS monitoring, banking and online data	i, ii, iii, iv, v, vi viii

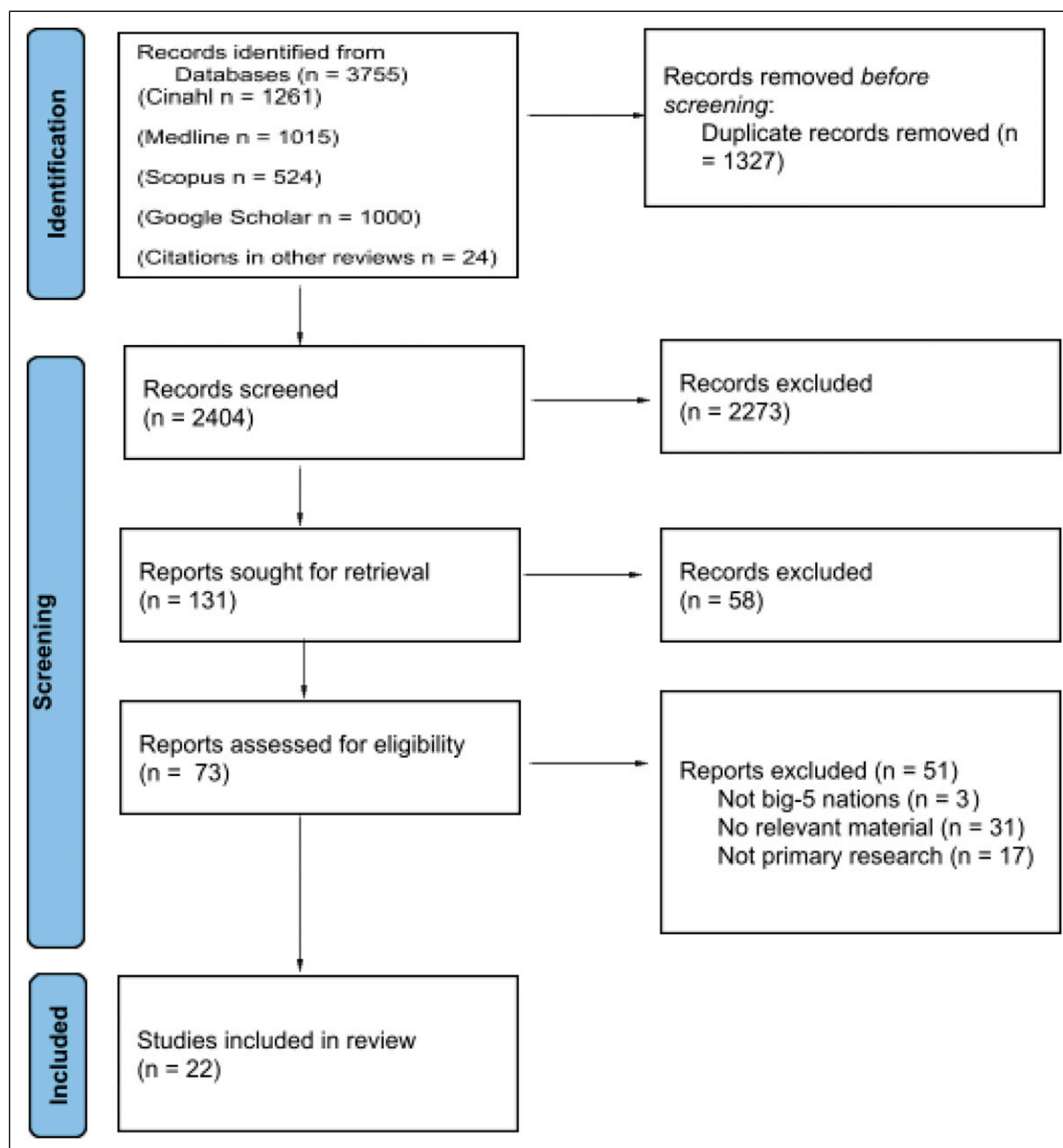


Figure 1. PRISMA Flow chart.

restricting access to or ownership of devices (Freed et al., 2018; Woodlock et al., 2020); limiting social media use and restricting links to social networks (Douglas et al., 2019); destruction of devices (Freed et al., 2018); hacking accounts, changing passwords or removing friends (Melander, 2010; Freed et al., 2018; Woodlock et al., 2020); deleting messages or context (Woodlock, 2015; Freed et al., 2018; Woodlock et al., 2020); and use of children's accounts and devices (Freed et al., 2019).

There were, however, some more distinct themes presented across the studies including: economic abuse; emotional abuse; harassment; intimidation; tracking and monitoring; image-based sexual abuse; abuse via social media and web-

based platforms. Many of these behaviours overlapped and were experienced simultaneously (phenomenon known as polyvictimization). For example, in Eaton (2020) the tactic of emotional abuse appeared in 90.7% of cases (total $n = 366$ cases) of non-consensual pornography (a form of image-based sexual abuse). Havard and Lefevre (2020) claimed that most of the data in their study was classified under various headings but, ultimately, it amounted to emotional abuse as the behaviour was intended to undermine, intimidate, frighten or cause distress. Similarly, this study noted that image-based sexual abuse was prevalent. Their claims, however, were based on a small sample of interviewees ($n = 12$).

A common finding reported in the studies was the use of technology and digital means to enable stalking and monitoring. Many of the victims/survivors in a qualitative study by Douglas et al. (2019) ($n = 55$), the only longitudinal study in the sample, described how mobile phones were commonly used to monitor and track their movements and whereabouts. One victim/survivor observed that her car's battery drained quickly and it was found to have a GPS tracking device installed. Another reported that her ex-partner had set up night vision cameras in her bedroom, with another describing how her partner installed video cameras in every room in their home on the pretense of being able to see their baby in each space. In a study of college students ($n = 540$), survey participants were aware that they were being monitored, but in others, they were not aware until the spyware, stalkerware or other covert monitoring had been uncovered (Marganski & Melander, 2018).

Another common theme across the studies was the use of text- and image-based abuse of both a sexual and non-sexual (but often intimidating) nature (Douglas et al., 2019; Henry & Flynn, 2019; Melander & Marganski, 2020; Powell & Henry, 2019; Woodlock, 2015). Douglas et al. (2019) found that participants in their study reported mobile phones often used with perpetrators making multiple calls and texts with threatening or harassing messages or through sending intimidating or embarrassing photographs. One woman in their study described how her ex-partner forced her to have sex and covertly filmed it. He then threatened to post the pictures onto the internet if the victim did not change her evidence in a forthcoming court hearing. This case provides an explicit example of sextortion.

Indeed, non-consensual sharing of images (aka revenge pornography) was commonly used as emotional abuse and/or to blackmail, humiliate and cause distress (Eaton 2020; Freed et al., 2018; Powell & Henry, 2018, 2019; Powell et al., 2020; Walker et al., 2019). It was shared with the public via the internet and directly with the families and children of victims/survivors. One study combined qualitative content analysis with a digital ethnographic approach to investigate the different types of pornography websites ($n = 77$), sites which facilitated image-based sexual abuse, and classified these as: revenge, ex-girlfriend and rape sites (Henry & Flynn, 2019).

Cyber harassment was commonly reported and enacted via a range of devices and technologies (Marganski & Melander, 2018; Melander & Marganski, 2020; Powell & Henry, 2019; Powell et al., 2020; Ross et al., 2019; Woodlock, 2015). Broadly, these behaviours can be divided into types of TFA that align with in-person IPV. For example, the threat of TFA was used to coerce victims/survivors into, for example, staying in the relationship and/or having unwanted sexual contact with the threatening partner or former partner. Additionally, new types of abuse are made possible through technology; for example, doxing (or doxxing) which is the act of publicly revealing private and personal information about an individual through the internet (Melander & Marganski, 2020). The division is not clear-cut because technology can

transform in-person abuse; for example, the ability to monitor a partner's activity is hugely enhanced by technology such that its effects on the victim may be overwhelming, as seen by the impact of omnipresence, described below.

The Impact of TFA

A small number of studies reported the consequences of TFA. Where data on impact was presented, it often depicted extreme and concerning effects on the victim. No studies reported how the perpetrators were affected having committed abuse. More importantly perhaps, although TFA often works by being socially visible, there was nothing directly reported on how it affects intimate relationships more widely. We return to this point in the discussion. There were four main themes on impact including: financial impacts; mental health outcomes; social impacts; and a sense of a perpetrator's omnipresence. We also note that consequences are rarely experienced in isolation but as overlapping and interacting.

Financial Impacts

A number of studies described how victims/survivors had experienced financial consequences of TFA (Douglas et al., 2019; Eaton, 2020; Leitão, 2019b; Melander, 2010; Woodlock, 2015; Woodlock et al., 2020). Impacts varied and included: lack of or limited access to finances and online banking; loss of employment; restrictions and prevention in securing employment; the accrual of debt; payment of hefty fees for the removal of sexual images from social media and web-based platforms; financial implications of purchasing new or replacement devices. Douglas et al. (2019) found that the intersecting control of finances and technology resulted in a lack of access to banking (and therefore money) when a perpetrator changed passwords for the internet banking of a victim/survivor and then destroyed her laptop (thereby incurring social impacts too in that the victim was isolated from her social network and had no resources to pay for a replacement). Alongside the financial impacts of this, victims/survivors' limited participation in the digital world can have a negative impact in terms of job prospects and other aspects of daily living (Douglas et al., 2019). Eaton (2020) described how the removal of sexual images that have been uploaded to 'slut-shaming' websites by a perpetrator in an act of non-consensual pornography was potentially unachievable for many victims/survivors noting that some of these sites charge hundreds of dollars in fees to remove sexual images.

Mental health outcomes

The reported harms to the mental health of victims/survivors ranged from the diagnosis of mental health conditions (e.g. depression and general anxiety disorder) to the doubting of one's sanity (through gaslighting) and suicidal ideation (Bond & Tyrrell, 2018; Eaton, 2020; Melander & Marganski, 2020;

Powell et al., 2020; Ross et al., 2019; 2019a; Woodlock, 2015, 2017). In Bond and Tyrell's (2018) UK-based survey of police officers ($n = 783$), they found that a large proportion ($n = 607$) thought that non-consensual pornography could lead a victim to experience mental health impacts such as depression and anxiety. Widespread feelings of fear and humiliation were reported across studies and, in some instances, embarrassment and fear meant some were unwilling to report the abuse.

From their content analysis of U.S. news stories, Eaton (2020) concluded that the negative impact of non-consensual image-sharing was especially traumatic and long-lasting, and often coupled with social and economic consequences. They reported how one victim, named 'Jane', whose ex-husband had posted pictures and videos online after surreptitiously recording their sexual encounters, likened the experience to that of being raped. Another victim described how the experience drove her to the brink of suicide. These findings were supported by a survey of students ($n=391$) who had sent private sexually explicit messages to their intimate partners that were subsequently widely shared (Walker et al., 2019). In a qualitative study, 2019a identified a different tactic used in cases of gaslighting as the misuse of smart home devices, such as locking and unlocking doors, remotely triggering alarms and changing heating settings. The use of gaslighting led to victims/survivors feeling that they were 'losing their mind'.

Social Impacts

Several studies included references to social impacts including; safety concerns; reduced contact with significant others; and social isolation (Douglas et al., 2019; Havard & Lefevre, 2020; Powell & Henry, 2018; 2019a; Woodlock, 2015). Overwhelmingly, the most frequently reported outcome was social isolation resulting from the direct actions of perpetrators. Studies also reported the consequences of advice given by professionals to TFA victims/survivors as leading to social isolation as such advice included changing email accounts, limiting or ceasing use of the internet and social media, blocking texts, messages, calls and emails or replacing devices (Powell and Henry, 2018). Inevitably, this can limit victims/survivors' participation in the digital sphere, restricting or losing their social connections and contact with others.

Omnipresence

One of the most striking consequences of TFA, marking its distinctiveness from other abuse, is its pervasiveness and reach. Almost all people carry a mobile phone, regularly access the internet and social media. As such, mobile phones can be used to abuse both for coercive control and maleficence on an almost continual basis. This pervasiveness was repeatedly cited in the empirical data reported and termed 'omnipresence' in many studies.

Omnipresence refers to the state of being widespread or constantly encountered. In the case of TFA, it describes how

perpetrators achieved the property of being present everywhere at all times. To convey omnipresence, Melander (2010) described a message received by a victim/survivor which simply read: 'I'm always in your inbox'. The sense of a perpetrator's omnipresence could be described as a tactic of TFA but it was also depicted in studies as a consequence (Douglas et al., 2019; Havard & Lefevre, 2020; Woodlock, 2017; Woodlock et al., 2020). Technology was used covertly and overtly to enable surveillance of victims/survivors to create the sense of omnipresence. Some victims/survivors described this relative to their experiences of IPV during and after their relationship had ended. Perpetrators used different technologies and methods (incessant texting or calling, social media postings). Havard and Lefevre (2020) found that in addition to omnipresence, TFA also resulted in some victims/survivors viewing perpetrators as omniscient (all knowing) and omnipotent (all powerful).

Some forms of TFA were omnipresent not just in their continual nature but also in their spread across time and social space. Time-wise, for example, images could not be erased from the internet and, disconcertingly, could reappear at any time. In addition, something posted on social media could be accessed widely both by personal, social and work associates. Some victims/survivors were concerned about how it might affect their future job prospects.

Resistance to TFA in Intimate Relationships

Most reviewed material focused on the perpetration of TFA, rather than resistance. Despite this, there were some empirical data on resistance reported. In particular, the dual nature of some technology was noted in terms of how it was used to both perpetrate and resist abuse. There were three main themes in relation to resistance including: direct action to stop TFA; legal and specialist support routes; barriers to resistance.

Direct Action to Stop TFA

Various types of action were identified. First, victims/survivors actively disengaged with technology and digital platforms by blocking contacts on social media, mobile phones or email (Douglas et al., 2019; Freed et al., 2019; Havard & Lefevre, 2020; Melander, 2010) or disconnecting from social media altogether (Douglas et al., 2019). They also took action by making changes to devices, cloud storage providers, phone numbers, email addresses or security settings (Douglas et al., 2019; Freed et al., 2019; Havard & Lefevre, 2020). As it was reported that children's devices or accounts were sometimes used as a means to enact abuse (mostly through covert recording or use of spyware), some victims/survivors reported how they had learned how to check their children's phones for new apps or devices after contact visits (Douglas et al., 2019; Eaton 2020).

Powell & Henry (2018) found that technology has a dual nature such that it can be used to resist as well as perpetrate

Table 4. Critical findings.**Main Findings**

The main findings were that TFA is diverse in its presentation and tactics, but can be typed according to the eight domains of the Duluth Power & Control Wheel.

Impacts are not routinely reported across studies but broadly fall into the categories of social, mental health and financial impacts and omnipresence.

Modes of resistance are infrequently reported in studies. When identified these can be categorized in the context of direct action, access to legal or professional support or in relation to barriers to resistance.

As direct action, the use of the technology used to perpetrate abuse could be more widely used as resistance; a mode of action we term *technology-facilitated resistance (techno-resistance)*.

Table 5. Implications for policy, practice and research

There is a lack of understanding and skill in terms of technology use in victims and professionals and, therefore, a training or awareness-raising need.

Minority groups have different risks and needs (e.g. victims with learning disabilities, asylum seekers and refugees).

More contextual knowledge is needed in relation to risk and protective factors and in relation to intersections of gender, race and ethnicity, socio-economic factors, sexual orientation, ability, etc., to inform assessment and case management.

Prevention, intervention and safety planning should be informed by a tool or checklist that explores TFA including issues around image-based sexual abuse (e.g. addressing the potential for non-consensual pornography).

A better understanding of how to collect and present digital evidence is needed.

Professionals need access to expert advice on security and privacy of devices and accounts.

There is a heightened risk for minoritized victims (e.g. people with learning disabilities, asylum seekers/refugees), particularly in relation to the dual control of finances and technology but this insight is under-developed and research is needed.

Investigation should focus on intersectionality and the influence of a range of intersecting identities and characteristics, specifically gender, age, ethnicity, sexual orientation, dis/ability and socio-economic position.

Research is needed on the context, meaning, motives and outcomes of TFA. More understanding is needed in relation to the prevalence of behaviours, but assumptions should not be made about such behaviours without investigating the context.

A wider range of data should be investigated through qualitative and quantitative studies including service provider records, helpline data, police data and court files; these are yet to be explored.

Online discussions forums provide information about the ways that perpetrators, victims and advocates share technology strategies with another; this is under-explored.

Research to explore the helpful uses of technology (e.g. apps and online support groups) in terms of how to increase safety and wellbeing as well as prevent more TFA is warranted.

Perpetrator behaviours – befriending contacts, providing phones, paying bills and contracts – should be explored to a greater depth.

Specific investigations into non-consensual pornography is needed to explore the ‘how, when and why’ it is used in intimate partnerships, for example, do perpetrators use it when other coercive and controlling methods have little or no effect? Is it perpetrated as revenge (on separation or if perpetrators believe their partners are unfaithful), to control or as blackmail?

Research should address the need for evidence-informed guidance for a range of formal support providers – social workers, police, sexual health workers and general practice workers – to inform risk assessment and intervention.

abuse. Similarly, a study by Douglas et al. (2019) reported the different ways that victims/survivors used technology for: protection (using, for instance, closed-circuit television (CCTV) and GPS); safety in relation to child contact (e.g. handing over a child in public where there was CCTV); recording evidence of abuse experiences (for instance, one victim recorded evidence of violence and threats resulting in a support service installing surveillance cameras in her home); and to justify separation from the perpetrator (one victim saved pictures on their phone to justify their separation to their partner’s relatives). Victims/survivors could thus use technology to record perpetrators in ways that were effective in enabling separation or providing evidence for legal redress (Powell & Henry, 2018, 2019). Unfortunately, of course, some

perpetrators could respond by ensuring their abuse could not be tracked or that messages were erased once received.

Legal and Professional Support Routes

A number of studies explored the utility of professional support in cases of TFA resistance (Bond & Tyrrell, 2018; Douglas et al., 2019; Freed et al., 2018, 2019). Bond and Tyrrell (2018) investigated police officers’ understanding of non-consensual pornography concluding that police in the UK have a limited understanding of the legislative framework pertaining to non-consensual pornography and lack confidence both in investigating cases and responding to victims/survivors. This finding was echoed in a study of Australian

police responses to TFA which suggested that online sexual harassment, cyberstalking and image-based sexual exploitation were not viewed as part of a continuum of violence with other forms of abuse; the researchers suggest this is a failure to recognize its serious consequences (Powell and Henry, 2018).

In an Australian study by Douglas et al. (2019), a number of women ($n = 17$) reported successful use of legal responses including: reporting TFA to police; adding specific conditions about TFA to their civil protection orders; and organizing for lawyers to send letters to abusers asking them to cease using technology to enact harm. There is a much richer body of empirical evidence on TFA that has emerged from Australia which possibly accounts for a more informed evidence-based response for victims/survivors.

A qualitative study in the US (Freed et al., 2019) reported findings from a study that explored the value of technical help as consultants tested a tool, named a technograph. The technograph enabled a clear picture of victim's digital footprint and entanglements to draw connections between people, devices and accounts to inform safety planning. Researchers in this study noted the limited ability of legal professionals to advise on what digital forensic evidence would be needed for use in a client's legal case as both clients and legal professionals looked to the research team for advice about what should be documented and how; for example, they were asked: 'so how do I prove that he's doing all these things? What are the next steps?'

Other studies detailed non-legal professional support or made conclusions on the basis of study findings. For example, after surveying a sample of college students ($n = 138$), Carlson et al. (2015) argued that because technology features heavily in young people's lives and in their personal relationships, relationship counselling should be more freely available to enable young people to incorporate technology in healthy ways within their relational practices.

Barriers to Resistance

There were a number of impediments to resistance. Some studies reported that perpetrators took physical action in destroying mobile telephones and devices belonging to victims/survivors effectively preventing them from reaching out to the police or other supports (Douglas et al., 2019; Freed et al., 2018). In addition, victims/survivors had their access to services withheld or cut (Douglas et al., 2019). While professionals frequently advise victims/survivors to disconnect or undertake a 'digital detox' (Levy, 2014), this approach isolates victims/survivors, from their supports and potentially interferes with their ability to engage in work and education. Douglas et al. (2019) also highlight that it is unfair to ask victims/survivors, to forsake their social links and connectedness when it is the perpetrator who has mis-used the technology. In addition, it can be highly impractical for victims/survivors to disconnect from technology and the digital world as increasingly routine services and daily activities require such a connection (Woodlock, 2015).

Similarly, Freed et al. (2018) found that professionals tended to, as the first port of call, advise that victims/survivors replace their devices but, in many cases, victims/survivors are unable to afford the cost of a new device or mobile plan particularly if perpetrators have been the main or sole financial provider in the family. More concerning, on making reports that they were worried that there were apps or tracking software on their devices, some studies reported victims/survivors being told by professionals that their devices were malfunctioning or that they did not know how to use them properly, further disempowering victims/survivors by questioning their judgements and demonstrating concern about the 'believability' of such cases (2019a). Even when believed, victims/survivors subsequently realized that professionals frequently had gaps in knowledge regarding TFA.

Discussion

This review of 22 studies exploring TFA in intimate relationships has revealed that TFA is positioned on a continuum of intimate partner violence that integrates abuse that is facilitated by technology as well as that which is perpetrated as types of in-person IPV. This illustrates a continuity and relationship between the two (TFA and in-person abuse), particularly when experienced as poly-victimization. However, it is salient to highlight the distinctiveness of TFA. We are living in a digital world in which we can be connected to others at all times of the day, from all corners of the world. This means that perpetrators of IPV can transcend temporal and physical world boundaries to covertly and/or overtly enact a wider range of abuse from anywhere, at any time. Thus, the scope and opportunities for TFA perpetration are considerable. Coupling this wide-ranging potential with the victim/survivor's experience of abuse as omnipresent, it is reasonable to argue that a victim/survivor's 'space for action' to resist TFA and seek support is significantly reduced (Kelly, 2003).

Melander and Marganski (2020) compared the effects of TFA and in-person IPV in a survey of undergraduate students ($n = 540$). They found *inter alia* that IPV was related to anger and depression and, independently, problematic substance use, with males at a higher risk of the latter. Importantly, TFA was linked more strongly than in-person IPV with certain maladaptive behaviours, such as substance use. They argue that TFA as IPV should no longer be considered by authorities as a less serious form of abuse than in-person IPV. A similar conclusion is drawn from a survey of undergraduate students ($n=885$, constituted by 584 women and 301 men) of sexting and in-person sexual coercion, which showed that sexting independently contributed to psychological, emotional and sexual problems in women (Ross et al., 2019).

Overall, the evidence on types of TFA illustrated that it maps consistently to the domains of the Duluth Power and

Control Wheel (Pence & Paymar, 1993) in terms of representing: i) emotional abuse; ii) intimidation; iii) denial, blame and minimization; iv) using male privilege; v) economic control; vi) coercion and threats; vii) using children; and, viii) isolation (Eaton, 2020; Freed et al., 2018, 2019; Havard & Lefevre, 2020; Marganski & Melander, 2018; Melander & Marganski, 2020; Woodlock, 2015; Woodlock et al., 2020). Many of the behaviours described are also examples of what Stark (2007) calls micro-regulation and contributed to the victim/survivor's lack of privacy, social isolation, reduced autonomy, financial dependence and, for many, poor mental health.

Determining the range of impacts, however, was less reported in the studies than the tactics and types of TFA found. It may be that some of the impacts are broadly similar to in-person abuse (in terms of their social, health, mental health and economic consequences), but there are some distinctive impacts resulting from TFA such as those that result from image-based abuse (non-consensual pornography in particular) and the ever-present threat of future appearances of humiliating and embarrassing images on the internet. The availability and presence of personal, sexual images or media, as noted above, can have catastrophic and distressing effects for victims/survivors (Henry & Flynn, 2019). In addition, the very existence of photos or videos of a sexual nature was used by perpetrators and highlighted Woodlock (2015: 13) who noted how some women felt absolutely 'stuck', 'trapped', powerless and totally controlled when perpetrators threatened to release photos or videos to family, friends and work colleges. This also served to prevent women from seeking police interventions and intervention orders.

The findings relating to gender were mixed in the papers reviewed. The qualitative papers were primarily focused on women who were victims/survivors; some papers only had women as the focus of abuse (e.g. Douglas et al., 2019; Woodlock, 2015). Where a quantitative comparison was drawn, the gender balance of abuse was less clear. For example, in relation to non-consensual sharing of sexually explicit media, and to sexting and sexual coercion, men also featured as victims/survivors at a level approaching that of women (Ross et al., 2019; Walker et al., 2019). Powell & Henry (2019) found, in a survey of Australian adults, that women and men report similar prevalence of technology-facilitated sexual violence against them; however, they note that it was likely that men were also probably the perpetrators of most of this violence, including that against other men.

While noting the direct actions that are available to victims/survivors in relation to TFA, an interesting finding of the scoping review was the lack of an evidence-informed framework for agency and professional responses. Studies noted the lack of knowledge and confidence of professionals (Bond & Tyrrell, 2018; Woodlock, 2017) in addition to victim-blaming and poor or inappropriate advice given to victims/

survivors (Woodlock, 2017). This means that there are plentiful policy and practice implications including the need for awareness raising and training, an evidence-informed approach to risk and needs assessment as well as case management and guidance for a multi-agency response. Indeed, there are a number of implications for future policy, practice and research resulting from this scoping review (see Table 4). These 'calls for action' are supported in other literature as Woodlock (2017: 584) argued that TFA 'needs to be treated as a serious offense, and effective practice, policy, and legal responses must be developed' (Table 5).

A small number of studies paid attention to diversity; for example, Douglas et al. (2019) provided a number of case studies of women from diverse ethnic and cultural backgrounds noting the heterogeneity of TFA types, impacts and modes of resistance in these instances. However, mostly studies did not illuminate or draw attention to such differences highlighting a future research priority in relation to TFA in terms of enabling a more informed understanding of TFA when experienced by minoritized people. Another implication for future research pertains to the lack of studies that focus on the role of children and how they are drawn into TFA either covertly or overtly. The use of TFA by proxy (i.e. abuse perpetrated through a third party such as a child, family member or friend of the victim/survivor) is under-researched more generally. This is particularly the case in the context of post-separation parenting in which technology provides perpetrators new ways of abusing, controlling, stalking and harassing their former partners and there is a clear need for qualitative and longitudinal research that examines the use of technology where there are children of the relationship (Markwick et al., 2019).

While studies illustrate how technology enables abuse, only a small number of studies show technology as facilitating resistance when digital and communications technology could be used more in this regard (Rempel et al., 2019; Grimani et al., 2020). In other words, the technology used to perpetrate violence and abuse (social media, video cameras, mobile phone and so on) could be used as *technology-facilitated resistance* (or *techno-resistance*). For example, social media could be used to generate formal networks of support to victims/survivors both to identify perpetrators and their deeds and to break through the isolation which victims/survivors of IPV frequently report. Indeed, a study that did not meet our inclusion criteria nonetheless made use of one such wider network (McCauley et al., 2018). Social media could also be better used as awareness-raising to increase people's knowledge of how to detect and disarm covert surveillance techniques (e.g. spyware).

Finally, several studies reported findings from samples of young people, often college students (Carlson et al., 2015;

Duerksen & Woodin, 2019; Marganski & Melander, 2018; Melander, 2010; Ross et al., 2019; Walker et al., 2019). Due to the nature of such samples, recruitment methods were often not random, but based on biased means such as recruiting students from a particular course of study. Additionally, there are limits of applying these findings to a population of all victims/survivors of IPA without an age boundary. Further, while a considerable number of studies can be found on youth and young adults in relation to cyberbullying and dating violence, TFA in long-term intimate partnerships has not been adequately explored (Freed et al., 2018; Powell & Henry, 2019). For this review, most research was conducted using quantitative surveys, highlighting the need for more qualitative research. Hence, there are clear implications for future research including the need to pursue consensus on defining and delimiting TFA within intimate relationships and when designing research taking recruitment, sampling and methods into account.

Limitations

The limitations of any study lie on a spectrum from the unavoidable to the avoidable. At the unavoidable end, for this study, are those shared with all scoping reviews. First, is the lack of full quality appraisal of the studies. Whilst we used a quality assessment tool as a simple method to exclude papers of poor quality, we did not go further in, for example, weighting the findings. This was appropriate for a scoping review, which does not seek definitive answers to a clear, quantitative question. However, it means that lying behind the findings reported are the limitations of included studies. There are some clear examples. The first is that of diverse methodologies, recruitment methods and sampling which are identified across the literature making comparison more challenging. Second, definitions of abuse are not always clear or consistent; thus, what is reported as impersonation in one paper might be recorded as doxing in another and gaslighting in a third. Third, the reporting of gender identities of abuser and victim/survivor is often inconsistent and/or unclear.

At the avoidable end of the spectrum, our protocol specified adults aged 18+; however, many papers had proportions of younger victims and we ended up using a post-hoc rule of using these where the majority were 18+. This probably had little effect on our findings but we would be more precise in future. Also avoidable was our decision to limit findings to the big five anglosphere countries. This choice was made in order to keep the data within manageable limits and was, to this extent, justified. Additionally, a recently published scoping review, describing technology-facilitated domestic abuse, did not adopt exclusion criteria by country yet only found relevant papers from regions in the big 5 (Afrouz, 2021). This provides further justification for our decision.

In the middle of the spectrum, probably nearer the unavoidable end, was the difficulty in parsing the findings with regard to any groups other than women who were the victims/survivors of TFA perpetrated by men. There were findings relating to other groups and to groups by other characteristics, such as ethnicity. Our study, however, focused almost exclusively on women as a whole. Since this work was done, however, there has been at least one scoping review focused exclusively on IPV in gay and bisexual men, although this has little to say concerning TFA (Callan et al., 2021).

The final limitation, which is at the unavoidable end of the spectrum, relates to the release of new relevant material outside the search time parameters. As well as the scoping reviews mentioned (Afrouz, 2021; Callan et al., 2021), we note, in particular, the publication of a new book that includes research of relevance including, for example, TFA amongst gay and bisexual men. The book is the Emerald International Handbook of Technology Facilitated Violence and Abuse. At present (August 2021), it is available freely online (Bailey et al., 2021). The new empirical material would probably leave unchanged our main findings, particularly concerning future research. However, the book also contains relevant discussion and should be a reference for anyone researching TFA in the near future.

Concluding Statement

This review has uncovered some critical messages for future directions. First, there are policy and practice implications to this evolving but nascent scholarship in that an evidence-informed framework for professional responses to TFA is needed. Second, enhanced understanding about the ways in which victim/survivors can adopt varied forms of digital and technology-facilitated resistance is needed to couple with evidenced-informed professional action. Third, better insights are needed of the ways in which TFA by proxy, particularly when involving children, is needed especially in post-separation cases when legal proceedings are ongoing. Fourth, we chose to focus on the big five countries, and we end with a call to all researchers, including colleagues in the Global South, to engage in research to advance understanding about TFA.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The authors received financial support from the World Universities Network for this project.

ORCID iDs

Michaela M. Rogers  <https://orcid.org/0000-0002-7214-4375>

Parveen Ali  <https://orcid.org/0000-0002-7839-8130>

Notes

1. http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/attach/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf

References

- * Leitão, R. (2019a). Anticipating smart home security and privacy threats with survivors of intimate partner abuse. Proceedings of the 2019 on Designing Interactive Systems Conference, San Diego, CA, USA, June 2019
- * papers included in the review
- Afrouz, R. (2021). The nature, patterns and consequences of technology-facilitated domestic abuse: A scoping review. *Trauma, Violence & Abuse*, 152483802110467. Advanced Online Publication, <https://doi.org/10.1177/15248380211046752>
- Arksey, H., & O'Malley, L. (2007). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32.
- Bailey, J., Flynn, A., & Henry, N. (Eds), (2021). *The Emerald international handbook of technology facilitated violence and abuse*. Emerald Publishing Limited.
- * Bond, E., & Tyrrell, K. (2018). Understanding revenge pornography: A national survey of police officers and staff in England and Wales. *Journal of Interpersonal Violence*, 36(5–6), 2166–2181. <https://doi.org/10.1177/0886260518760011>
- Briggs, C. (2018). An emerging trend in domestic violence: technology-facilitated abuse. *Australian Journal of Child and Family Health Nursing*, 15(1), 2. <https://search.informit.com/doi/10.3316/informit.021135494223385>
- Callan, A., Corbally, M., & McElvaney, R. (2021). A scoping review of intimate partner violence as it relates to the experiences of gay and bisexual men. *Trauma, Violence, and Abuse*, 22(2), 233–248. <https://doi.org/10.1177/1524838020970898>
- * Carlson, R. G., Fripp, J., Cook, C., & Kelchner, V. (2015). Examining intimate partner violence, stress and technology use among young adults. *The Professional Counselor/National Board for Certified Counselors (NBCC)*, 5(3), 365–378. <https://doi.org/10.15241/rgc.5.3.365>
- * Carlyle, K. E., Guidry, J. P. D., Dougherty, S. A., & Burton, C. W. (2019). Intimate partner violence on instagram: visualizing a public health approach to prevention. *Health Education & Behavior*, 46(Suppl 2), 90–96. <https://doi.org/10.1177/1090198119873917>
- * Douglas, H., Harris, B. A., & Dragiewicz, M. (2019). Technology-facilitated domestic and family violence: Women's experiences. *British Journal of Criminology*, 59(3), 551–570. <https://doi.org/10.1093/bjc/azy068>
- * Duerksen, K., & Woodin, E. (2019). Technological intimate partner violence: Exploring technology-related perpetration factors and overlap with in-person intimate partner violence. *Computers in Human Behaviour*, 98, 223–231. <https://doi.org/10.1016/j.chb.2019.05.001>
- * Eaton, A. A. (2020). Nonconsensual porn as a form of intimate partner violence: Using the power and control wheel to understand nonconsensual porn perpetration in intimate relationships. *Trauma, violence, & abuse*, 22(5), 1140–1154. <https://doi.org/10.1177/1524838020906533> <https://journals-sagepub-com.sheffield.idm.oclc.org/doi/pdf/10.1177/1524838020906533>
- Economist Intelligence Unit (2021). *Measuring the prevalence of online violence against women*. EIU. Retrieved from <https://onlineviolencewomen.eiu.com/>
- * Freed, D., Palmer, J., Minchala, D., Levy, K., Rishenpart, T., & Dell, N. (2018). A stalker's paradise": How intimate partner abusers Exploit technology. Proceedings of the 2018 CHI Conference on human Factors in Computing Systems. Montreal, QC, April 2018.
- * Freed, D., Havron, S., Tseng, E., Gallardo, A., Chatterjee, R., Rishenpart, T., & Dell, N. (2019). Is my phone hacked?" analyzing clinical computer security interventions with survivors of intimate partner violence. *Proceedings of the ACM on human-computer interaction*. Association for Computing Machinery, 3(202), 1–24. <https://doi.org/10.1145/3359304>
- Grimani, A., Gavine, A., & Moncur, W. (2020). An evidence synthesis of covert online strategies regarding intimate partner violence. *Trauma, Violence & Abuse*, 23(2), 1–13. <https://doi.org/10.1177%2F1524838020957985>
- * Havard, T. E., & Lefevre, M. (2020). Beyond the power and control Wheel: How abusive men manipulate mobile phone technologies to facilitate coercive control. *Journal of Gender-Based Violence*, 4(2), 223–239. <https://doi.org/10.1332/239868020x15850131608789>
- * Henry, N., & Flynn, A. (2019). Image-based sexual abuse: online distribution channels and illicit communities of support. *Violence Against Women*, 25(16), 1932–1955. <https://doi.org/10.1177/1077801219863881>
- Henry, N., & Powell, A. (2018). Technology-facilitated sexual violence: A literature review of empirical research. *Trauma, Violence & Abuse*, 19(2), 195–208. <https://doi.org/10.1177/1524838016650189>
- Johnson, M. P. (2010). *A typology of domestic violence: Intimate terrorism, violent resistance, and situational couple violence*. Lebanon: Northeastern University Press.
- Kelly, L. (2003). The wrong debate: Reflections on why force is not the key issue with respect to trafficking in women for sexual exploitation. *Feminist Review*, 73(1), 139–144. <https://doi.org/10.1057/palgrave.fr.9400086>
- Laxton, C. (2014). *Virtual world, real fear: Women's aid report into online abuse*. Women's Aid. Retrieved from https://www.womensaid.org.uk/wp-content/uploads/2015/11/Women_s_Aid_Virtual_World_Real_Fear_Feb_2014-3.pdf
- * Leitão, R. (2019b). Technology-facilitated intimate partner abuse: A qualitative analysis of data from online domestic abuse forums. *Human-computer Interaction*, 36(3), 203–242.
- Levy, K. E. (2014). Intimate Surveillance. *Idaho Law Review*, 51(3), 679.

- * Marganski, A., & Melander, L. (2018). Intimate partner violence victimization in the cyber and real world: Examining the extent of cyber aggression experiences and its association with in-person dating violence. *Journal of Interpersonal Violence*, 33(7), 1071–1095. <https://doi.org/10.1177/0886260515614283>
- Markwick, K., Bickerdike, A., Wilson-Evered, E., & Zeleznikow, J. (2019). Technology and family violence in the context of post-separated parenting. *Australian and New Zealand Journal of Family Therapy*, 40(1), 143–162. <https://doi.org/10.1002/anzf.1350>
- McCauley, H. L., Bonomi, A.E., Maas, M.K., Bogen, K.W., & O'Malley, T.L. (2018). #MaybeHeDoesntHitYou: Social media underscore the realities of intimate partner violence. *Journal of Women's Health*, 27(7), 885–891. <https://doi.org/10.1089/jwh.2017.6560>
- * Melander, L. A. (2010). College students' perceptions of intimate partner cyber harassment. *Cyberpsychology, Behavior and Social Networking*, 13(3), 263–268. <https://doi.org/10.1089/cyber.2009.0221>
- * Melander, L. A., & Marganski, A. J. (2020). Cyber and in-person intimate partner violence victimization: Examining maladaptive psychosocial and behavioral correlates. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 14(1). <https://doi.org/10.5817/cp2020-1-1>
- Messing, J., Bagwell-Gray, M., Brown, M., Kappas, A., & Durfee, A. (2020). Intersections of stalking and technology-based abuse: Emerging definitions, conceptualization, and measurement. *Journal of Family Violence*, 35(7), 693–704. <https://doi.org/10.1007/s10896-019-00114-7>
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 143. <https://doi.org/10.1186/s12874-018-0611-x>
- Office of the e-Safety Commissioner (2017). *Image-based abuse: National survey, summary report*. esafety.gov. Retrieved from <https://www.esafety.gov.au/sites/default/files/2019-07/Image-based-abuse-national-survey-summary-report-2017.pdf>
- Pence, E., & Paymar, M. (1993). *Education groups for men who batter: The Duluth model*. Springer.
- Pham, M., Rajić, A., Greig, J., Sargeant, J., Papadoupoulosa, A., & McEwen, S. (2014). A scoping review of scoping reviews: Advancing the approach and enhancing the consistency. *Research Synthesis Methods*, 5(4), 371–385. <https://doi.org/10.1002/jrsm.1123>
- * Powell, A., & Henry, N. (2018). Policing technology-facilitated sexual violence against adult victims: Police and service sector perspectives. *Policing and Society*, 28(3), 291–307. <https://doi.org/10.1080/10439463.2016.1154964>
- * Powell, A., & Henry, N. (2019). Technology-facilitated sexual violence victimization: Results from an online survey of Australian adults. *Journal of Interpersonal Violence*, 34(17), 3637–3665. <https://doi.org/10.1177/0886260516672055>
- * Powell, A., Scott, A. J., & Henry, N. (2020). Digital harassment and abuse: Experiences of sexuality and gender minority adults. *European Journal of Criminology*, 17(2), 199–223. <https://doi.org/10.1177/1477370818788006>
- Rempel, E., Donelle, L., Hall, J., & Rodger, S. (2019). Intimate partner violence: A review of online interventions. *Informatics for Health and Social Care*, 44(2), 204–219. <https://doi.org/10.1080/17538157.2018.1433675>
- Rogers, M. (2020). Exploring the domestic abuse narratives of trans and non-binary people and the role of cisgenderism in identity abuse, misgendering and pathologizing. *Violence Against Women*, 27(12–13), 2187–2207. <https://doi.org/10.1177/1077801220971368>
- * Ross, J. M., Drouin, M., & Coupe, A. (2019). Sexting coercion as a component of intimate partner polyvictimization. *Journal of Interpersonal Violence*, 34(11), 2269–2291. <https://doi.org/10.1177/0886260516660300>
- Stark, E. (2007). *Coercive control: How men entrap women in personal life*. Oxford University Press.
- Stonard, K. (2021). Technology-assisted abuse in relationships. In J. Devaney, C. Bradbury-Jones, R.J. Macy, C. Overlien, & S. Holt (Eds), *The routledge international handbook of domestic violence and abuse* (pp. 356–372). Routledge. <https://doi.org/10.4324/9780429331053-27>
- Tanczer, L. (2020). *Gender and the internet of things*. UCL. Retrieved from <https://www.ucl.ac.uk/steapp/research/digital-technologies-policy-laboratory/gender-and-iot>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., & Godfrey, C. M. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, 169(7), 467–473. <https://doi.org/10.7326/M18-0850>
- Villora, B., Yubero, S., & Navarro, R. (2019). Associations between feminine gender norms and cyber dating abuse in female adults. *Behavioral Sciences*, 9(4), 35–47. <https://doi.org/10.3390/bs9040035>
- * Walker, K., Sleath, E., Hatcher, R. M., Hine, B., & Crookes, R. L. (2019). Nonconsensual sharing of private sexually explicit media among university students. *Journal of Interpersonal Violence*, 36(17–18), NP9078–NP9108. <https://doi.org/10.1177/0886260519853414>
- * Woodlock, D. (2015). *ReCharge: Women's technology safety, legal resources, research & training*. Domestic Violence Resource Centre Victoria and WESNET.
- * Woodlock, D. (2017). The abuse of technology in domestic violence and stalking. *Violence Against Women*, 23(5), 584–602. <https://doi.org/10.1177/1077801216646277>
- * Woodlock, D., McKenzie, M., Western, D., & Harris, B. (2020). Technology as a Weapon in domestic violence: Responding to digital coercive control. *Australian Social Work*, 73(3), 368–380. <https://doi.org/10.1080/0312407x.2019.1607510>
- World Health Organization (2021). *Violence against women*. WHO. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/violence-against-women>

Author Biographies

Michaela Rogers, PhD, is a Senior Lecturer in Social Work in the Department of Sociological Studies at the University of Sheffield. Her research examines interpersonal violence with a focus on marginalized groups, impacts, access to services and service responses. This includes research on elder abuse, trans and non-binary people's experiences, intimate partner violence and children.

Colleen Fisher, PhD, is a Professor in Public Health in the School of Population & Global Health at the University of Western Australia. Her research examines experiences of intimate partner violence across the lifespan and cross-culturally, evaluation of interventions and policy development. This includes research on experiences and perpetration of intimate partner violence in communities from a refugee background.

Parveen Ali, PhD, is a Professor in Nursing in the Health Sciences School, the University of Sheffield and Doncaster and Bassetlaw Teaching Hospitals. Her research examines gender-based violence, inequalities in health related to gender and ethnicity and nursing as a profession.

Peter Allmark is a Research Associate in the Health Science School, the University of Sheffield. Peter has published widely in topics related to nursing and healthcare.

Lisa Fontes, PhD, is a Senior Lecturer II at the University of Massachusetts Amherst. She has written several books and numerous scholarly and popular articles on child abuse and intimate partner violence. Her book, *Invisible Chains: Overcoming Coercive Control in Your Intimate Relationship*, was the second book published on Coercive Control.