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A Systematic Review into Risk and Protective Factors for Online Sex Offending

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Abstract

With the increased availability of the internet and new technologies, use of the internet to commit sex offences has been well documented. Despite increased interest, no systematic review has yet evaluated the risk and protective factors evidenced for online sex offending among those engaged in such behaviour. The current review aims to investigate this via a systematic review of 43 relevant articles. The emerged focus was on child abuse images. Thematic analysis identified seven risk factors: evidence for cognitive distortions; difficulties with relationships; managing isolation, loneliness, and boredom; psychological traits connected to low self-worth, poor psychological health, and impulse challenges; interest in deviant sexual material; child abuse images as reinforcing for emotions; and developing a hyper-fixation and preoccupation with sex. Limitations and implications are discussed, including the absence of researched protective factors.

Keywords: Online offending; Internet offending; Risk; Protective factors; Sex offence; Technology.

Introduction

In England and Wales in 2021, police recorded a total number of 183,587 sex offences, the majority of which were contact offences. This was a significant rise from previous years (Office for National Statistics, 2022). However, interestingly, a study examining prevalence rates of sexual violence globally from 1993 to 2017 (Borumandnia et al., 2020), found that the rates of sexual violence against both sexes had decreased in countries with a high human development index, with the decrease being largest in the United States and Europe. In countries with low human development index, however, the rates of sexual violence increased for offences against women, but decreased for men (Borumandnia et al., 2020). Although such statistics might indicate a decrease in sex offending globally, it is important to note that numerous sex offences are either unrecorded and/or unreported (Office for National Statistics, 2022), which has implications for the true estimation of prevalence rates (Hirschtritt et al., 2019).

The increased availability of technologies has resulted in difficulties detecting online sex offenders. This is partially due to the anonymity that the internet provides (Elliott & Beech, 2009), and the increased use of secure websites (i.e., Reddit, Discord; Hirschtritt et al., 2019) and the dark web (Rajamäki et al., 2022). Additionally, some offenders might misspell words deliberately, or combine several words to attempt to avoid detection by technologies designed to identify online child abuse (Seigfried-Spellar et al., 2019). Further, the increase of

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smartphones means that individuals can be online constantly (McCartan & McAlister, 2012), offering the ability to offend from any location. The wide availability of the internet has further resulted in some using the internet to excess. This has been labelled as problematic internet use, or internet addiction, and has been linked to compulsive engagement in sexual behaviour (Chen & Jiang, 2020). For example, a meta-analysis found prevalence rates of internet addiction between 1997 and 2018 to be 7.02% (Pan et al., 2020). Problematic internet use has been linked to online sexual offences (Mitchell & Wells, 2007), with the internet providing a means by which to access potential victims, such as children (Babchishin et al., 2011). For example, Mitchell and Wells (2007), found that of those displaying problematic internet use, 13% had accessed child abuse images. It is further noted that those who commit online sexual offences online and are apprehended by the legal system have frequently claimed they were addicted to the illegal material accessed (Bourke & Hernandez, 2009; Paquette & Cortoni, 2020).

There has been a plethora of research conducted on aetiology, risk factors and theories for offline offending. For example, the *Integrated Theory of Sexual Offending* (ITSO: Ward & Beech, 2006), notes that biological, neuropsychological, and ecological factors contribute to the development of sex offending. More specifically, difficulties in the realms of emotions, social, cognitive, and deviant arousal results in increased likelihood of sexually offending (Ward & Beech, 2016). Further, there are several risk assessment tools available for offline offending, which have been noted as useful for treatment, and in predicting recidivism (Van den Berg et al., 2018), but have not been able to account fully for the offending that is taking place in an online environment. This is potentially due to the different motivations for engaging in sexually abusive behaviour online (Beech & Elliott, 2012). However, although theories for offline offending might help aid the understanding of the development of online sexual offending, a lack of understanding of the aetiology of online sexually abusive behaviour remains.

Another important aspect when considering risk of offending, is protective factors. That is, factors that help an individual desist from offending, even when exposed to risk factors (Rennie & Dolan, 2010). Including protective factors in a risk assessment formulation has been noted to have the ability to increase predictive validity of the assessment (de Vries Róbbé et al., 2015). Protective factors for offline offending have been suggested to be healthy sexual interests, empathy, positive support network, problem solving abilities, positive attitudes to desistance, employment or leisure activities, and desisting from using substances (de Vries Róbbé et al., 2015; Casey & Masters, 2017). Although the Structured Assessment of Protective Factors – Sexual Offence version has shown the ability to predict sexual recidivism (Nolan et al., 2022), protective factors for sexual offending remains less understood, as the evidence basis for this is limited (de Vries Róbbé et al., 2015; Casey & Masters, 2017).

In addition, information is largely unavailable with respect to how online offenders make the transition to contact offending (Fortin et al., 2018; Hirschtritt et al., 2019), given that the number of individuals making this transition has been argued to be relatively low (Seto et al., 2011). However, online offenders have been noted to disclose undetected contact offences during assessments and investigations (Seto et al., 2011). Thus, it can be difficult to truly ascertain whether an individual is a ‘pure’ online or rather a mixed offender. There are differences reported with the individuals who sexually abuse children online (Babchishin et al., 2015), indicating that this group is heterogenous rather than homogenous (Shelton et al., 2016). For example, Briggs et al. (2011) noted, based on motivational tendencies, that there

are two distinct types of online offenders: contact driven, and fantasy driven. Contact driven offenders are motivated to achieve an offline meeting to further the cycle of abuse, whereas fantasy driven offenders appear solely motivated and aroused by online sexual activities. Although these typologies have been widely accepted, there have been difficulties in classifying individuals based on these categories alone, as they both primarily operate online, and share similar traits (Broome et al., 2018).

Gaining a better understanding of potential risk factors for those who commit online sexual offences is important for assessment, treatment, and prevention purposes (Babchishin et al., 2011; Chopin et al., 2022). Indeed, given there are so many unknowns with respect to this population there are few empirically supported methods of treatment and assessment (Hirschtritt et al., 2019; Merdian et al., 2009). This issue is further exacerbated by the fact that there often are several undetected prior offences for those who commit sexual offences, and particularly those offence that occur online (Aslan, 2011; Bourke & Hernandez, 2009).

In addition, heterogeneity is not just found within the offenders themselves, but within the nature of the offending. There are various forms of online sex offending, such as child grooming and solicitation, child abuse material (sometimes erroneously referred to as ‘pornography’), and exhibitionism (Babchishin et al., 2015). However, the literature has focussed more on detecting those who sexually exploit children online. Thus, a systematic review of risk and protective factors for all types of online sex offences are required. To afford a more complete picture, the current study aims to address the risk and protective factors associated with such offending but does not seek to restrict the review by considering only a specific form of online offending or a limitation of victim type (e.g., child and/or adult). The focus on protective factors is a response to advances in the risk assessment field more generally that seeks to capture factors that bring an offender away from their criminal act. This has not yet been considered within the area of online sexual offending. By addressing these areas systematically, it was aimed that the research can support the underpinning of more holistically and empirically informed approaches to both risk assessment and treatment with this group of offenders.

Method and Analysis

Search Strategy

Searches of Psycinfo, Psycarticles and Web of Science were conducted. The following search terms were utilised: “online” OR “internet” OR “hands off” OR “no contact” OR “internet facilitated” AND “sex* “offen*” OR “abuse” OR “exploit” OR “pornography offen*” AND “protective” OR “risk” OR “factor”. Manual hand searching was used to obtain further relevant publications from reference lists.

Inclusion and Exclusion Criteria

Research focusing on risk and protective factors for online sexual offending were included, restricted to empirical articles that were available in English. There were no time limits placed on the search. Excluded articles were those that did not focus on online offending, those failing to identify risk or protective factors, or those focusing on sexting.

Eligibility Screening

Articles were initially screened to determine if they fulfilled the inclusion criteria based on titles and abstracts. In order to minimise the risk of bias, a random sample of 10% ($n=17$) of the articles were sent to an independent researcher to assess for eligibility of full text articles. Cohen's Kappa was used to assess agreement score, resulting in a score of 1.00 ($p<.005$) (i.e., perfect agreement).

Quality Assessment

Two quality appraisal tools were used to assess risk of bias. The Critical Appraisal Skills Programme (CASP, 2021) was utilised for qualitative studies. This is a 10-item checklist where items are rated as yes, no, or can't tell. The Joanne Briggs Institute Critical Appraisal Tool (JBI; Moola et al., 2017) was used for quantitative studies. This is an eight-item checklist. Items are rated as yes, no, or unclear. Interrater reliability was measured via an independent researcher who assessed 10% ($n=5$) of the included articles. This received a Cohen's Kappa score of .80 ($p<.05$; good agreement).

Data Extraction and Analysis

A data extraction table was designed, including sample descriptors, sex differences, and differences between online and offline offenders. Although data was extracted for offline sex offenders, the data focused on related to online offenders. This was a result of some papers including reference to both. See Table 1.

The data was analysed using thematic analysis, following the steps outlined by Braun and Clarke (2006). This consisted of developing codes from the papers, which then guided the identification of patterns within the articles. This was followed by generating themes from the codes and patterns identified. The codes were generated by re-reading the articles, and becoming familiar with the data (Terry et al., 2017). The themes were then refined based on their description, and agreement of theme labels occurred through discussion with the authors (LS, NK).

Included Articles

Of the 12,047 identified articles, 448 duplicates were removed, with 11,599 articles remaining. A further 11,559 articles were excluded as they did not meet inclusion requirements, leaving 40 articles for in depth screening. Following reference list screening, an additional three articles were identified for inclusion, resulting in a total of 43 articles, see Figure 1. The process for screening and excluding articles was informed by Varker et al. (2015), namely, exclude irrelevant titles and abstracts prior to reading full texts, and deciding whether the full text paper meets the predetermined inclusion criteria. This is followed by inter-rater reliability of the full-text papers, quality assessment and data extraction.

Table 1
Demographic Information Details

	Country	Sample size	Sex	Age in years (<i>M</i>)	Offending status	Marital status (internet offenders only %)
Armstrong & Mellor (2016)	Australia	162	Male	45	Internet (<i>n</i> 32) Contact (<i>n</i> 32) Adult sex offender (<i>n</i> 31) Mixed (<i>n</i> 20) Community control (<i>n</i> 47)	Single=40.6% Steady partner=3.8% Separated=5% Divorced=8.8% De facto relationship=6.9% Widowed=1.9%
Bates & Metcalf (2007)	UK	78	Male	Unknown	Internet (<i>n</i> 37) Contact offences (<i>n</i> 39) Mixed (<i>n</i> 2)	Unknown
Bergen et al. (2015)	Germany, Finland, Sweden	717	Male (<i>n</i> 413) Female (<i>n</i> 304)	Male=27.9 Female=30.3	Internet	<u>Adult sexual contact</u> Single=52.5% In a relationship=41% Married=7% <u>Minor sexual contact</u> Single=54.5% In a relationship=38% Married=7.8%
Burgess et al. (2012)	US	101	Male	40.8	Internet	Married once=59% Never married=39.2%
Clevenger et al. (2016)	US	755	Male (99%) Female (1%)	Range 18-29 (38.1%)	Internet	Single=52.7% Married=24.1% Cohabiting=6.8% Separated/divorced/ widowed=16.3%

Eke et al. (2011)	Canada	541	Male	39.7	Internet	
Elliott et al. (2009)	UK	1031	Male	Internet=40.1 Contact=42.2	Internet (<i>n</i> 505) Contact (<i>n</i> 526)	In a relationship=23.4%
Elliott et al. (2012)	UK	1128		Internet=39 Contact=42.2 Mixed=42	Internet (<i>n</i> 459), contact (<i>n</i> 526), mixed (<i>n</i> 143)	Single=58.1% Married=24% Separated/divorced=17.9%
Endrass et al. (2009)	Switzerland	231	Male	36	Internet	Single=58% Married=33% Divorced=8% Widowed=1%
Faust et al. (2015)	US	638	Male	Internet=43 Contact=39.1	Internet (<i>n</i> 428) Contact (<i>n</i> 210)	Married=32.9%
Garman et al. (2021)	US	9	Male	26.75	Internet	
Henry et al. (2010)	UK	422	Male	39.3	Internet	Single=61.9% Divorced/separated=19.9% Married=17.3%
Henshaw et al. (2018)	Australia	1205		Internet=45.58 Mixed=44.98 Contact=49.17	Internet (<i>n</i> 456) Mixed (<i>n</i> 256) Contact (<i>n</i> 493)	
Jung et al. (2013)	Canada	196	Male	Internet=37.1 Contact=37.1 Non-contact=37.6	Internet (<i>n</i> 50) Contact (<i>n</i> 101) Non-contact (<i>n</i> 45)	Single=68%
Knack et al. (2020)	Canada	20	Male	Range 28-70	Internet	Single=35% Separated=30%

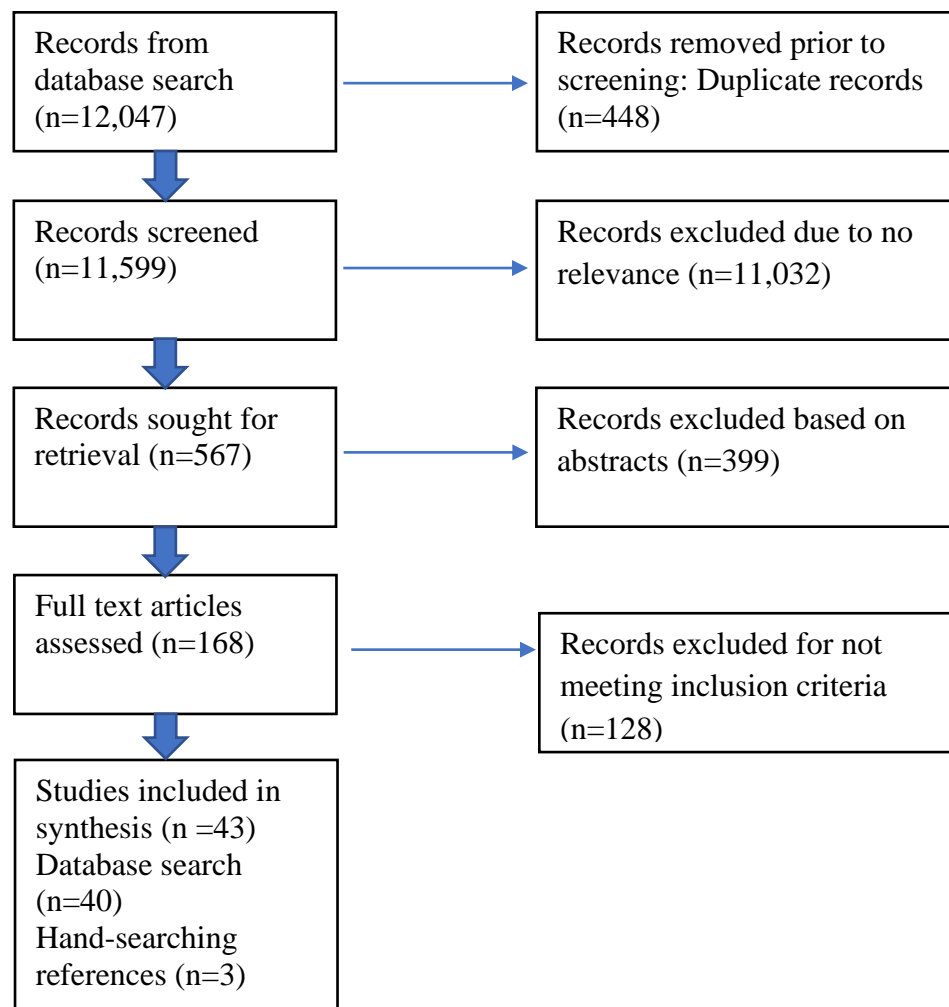
						Divorced=20% Married=15%
Kuhle et al. (2016)	Germany	190	Male	36.67	Internet	Single=28.9%
Laulik et al. (2007)	UK	30	Male	40.73	Internet	Married=30% In a relationship=16.7%
Long et al. (2016)	UK	374	Male	N/A	Internet (n204) Mixed (n170)	N/A
Magaletta et al. (2014)		541	Male	Internet=51.4 Contact=44.1	Internet (n35) Contact (n26) Control (n480)	Married=34.3% Divorced=34.3% Single=28.6%
McManus et al. (2015)	UK	245	Male	Internet=42.37 Mixed=42	Internet (n125) Mixed (n120)	Single=56.9% Separated=9.1% Cohabiting=13.2% Married=29%
Merdian et al. (2018)	New Zealand	68	Male	Internet=41.82 Mixed=56.56 Contact=41.29	Internet (n22) Mixed (n17) Contact (n29)	Live-in=31.82% Sexual relationship=36.36%
Merdian et al. (2020)	UK	20	Male	44.8	Internet	N/A
Middleton et al. (2006)	UK	72	Male	43.14	Internet	N/A
Morgan & Lambie (2019)	New Zealand	12	Male	Range 22-70	Internet	N/A
Neutze et al. (2010)	Germany	137	Male	40	Internet (n42)	Single=68.8%

					Contact (<i>n</i> 45) Mixed (<i>n</i> 50)	
Paquette & Cortoni (2021)	Canada	241	Male	Sex-offenders=42.67 Non-offenders=37.36	Internet (<i>n</i> 56) Mixed (<i>n</i> 68) Contact (<i>n</i> 44) Non-offenders (<i>n</i> 73)	N/A
Paquette & Fortin (2021)	Canada	137	Male	39.35	Internet (<i>n</i> 111) Mixed (<i>n</i> 26)	In a relationship=43.8%
Paquette et al. (2022)	Canada	98	Male	40.58	Internet	In a relationship=57%
Price et al. (2015)	New Zealand	46	Male	39	Internet	Single=65.2% With a partner=17.4% Married=13%
Qualye et al. (2000)	Ireland	1	Male	N/A	Internet	Married
Ray et al. (2013)	US	175	Male	31.1	Internet	In a relationship=65%
Reijnen et al. (2009)	The Netherlands	134	Unknown	Internet=37 Other sexual=47	Internet (<i>n</i> 37) Other sexual offenders (<i>n</i> 47) Non-sexual offenders (<i>n</i> 65)	N/A
Schulz et al. (2017)	Germany, Sweden, Finland	2828	Male (<i>n</i> 1383) Female (<i>n</i> 1431)	Adult sexual contact=29.28 Minor sexual contact=25.36 No sexual contact=28.37	Adult sexual contact (<i>n</i> 642) Minor sexual contact (<i>n</i> 137) No sexual contact (<i>n</i> 2035)	Adult sexual contact Single=52.6% Minor contact Single=56.9%

Seto & Eke (2017)	Canada	286	Male	N/A	Internet	Never married=54%
Seto et al. (2012)	Canada	396	Male	Internet=39.87 Contact=35.55	Internet (<i>n</i> 146) Contact (<i>n</i> 250)	N/A
Seigfried-Spellar (2014)	US	273	Male (<i>n</i> 142) Female (<i>n</i> 128)	Median range 26-35	Internet (<i>n</i> 16) Non-offending (<i>n</i> 257)	Single=69% Married=31%
Smid et al. (2015)	Netherlands	150	Male	Internet=42.4 Mixed=43	Internet (<i>n</i> 83) Mixed (<i>n</i> 67)	Single=54%
Soldino et al. (2019)	Spain	347	Male	41.8	Internet (<i>n</i> 329) Mixed (<i>n</i> 18)	Single=46% Married=34% Separated/divorced=6.9%
Steely et al. (2018)	US	25	Male	39	Internet	Married=12% Not married=88%
Surjadi et al. (2010)	The Netherlands	43	Male	48	Internet	Married/Cohabiting=51% In a relationship=2.7% Single-35.1% Divorced=10.8%
Tomak et al. (2009)	US	152	Male	40.68	Internet (<i>n</i> 45) Contact (<i>n</i> 104)	Married=37% Divorced=42% Separated=2%
Webb et al. (2007)	UK	210	Male	Internet=38 Contact =45	Internet (<i>n</i> 90) Contact (<i>n</i> 120)	Single=45.6% Divorced/separated=6% Married/cohabit=38%

Figure 1

Study chart depicting the systematic review process



Study Characteristics

The studies were conducted in Western countries, with the majority being from UK ($n=11$), US ($n=9$) and Canada ($n=8$). The 43 articles included a total of 14,586 participants. There was a total of 7,988 online offenders, 952 mixed offenders, 2,581 contact offenders, 16 professionals, and 3,049 control individuals (see Table 1). The quality assessment resulted in 40 articles receiving a score of low risk of bias, two articles scoring medium, and one article receiving a score of high risk (see Table 2).

Table 2*Summary and Quality Assessment of Articles Included in the Review*

Author(s)	Country	Research design	Participants	Key findings (Risk/protective factors)	Quality assessment tool and risk of bias rating using CASP (Critical Appraisal Skills Programme) or JBI (Joanne Briggs Institute Critical Appraisal Tool).
<i>NB: CAI = Child Abuse Images</i>					
Armstrong, & Mellor (2016)	Australia	Cross-sectional	162	CAI offenders viewed themselves and others more negatively than offline offenders. They had less secure attachment than other sex offenders and had more difficulties establishing adult relationships.	JBI, low
Bates & Metcalf (2007)	UK	Cross-sectional	78	Higher levels of emotional loneliness and under assertiveness than contact offenders. Online offenders did not condone sexual abuse of children.	JBI, low
Bergen et al. (2015)	Germany, Finland, Sweden	Cross-sectional	717	Shame and sexual arousal were heightened before interacting sexually with a child or adolescent online. CAI alleviated negative emotions and heightened positive emotions.	JBI, low
Burgess et al. (2012)	US	Cross-sectional	101	Online offenders were well educated, in a relationship, and had fewer prior convictions.	JBI, low

				Self-reported they have committed undetected hands-on offences.	
Clevenger et al. (2016)	US	Cross-sectional	755	Previous use of violence had a medium effect on the risk of being arrested for child abuse images. Living with a minor and having substance use problems linked to being arrested for child abuse images. Producers/Distributors had less self-control than possessors.	JBI, low
Eke et al. (2011)	Canada	Cross-sectional	541	Recidivism was predicted by criminal history, particularly violent offences. One quarter of the sample failed their release.	JBI, low
Elliott et al. (2009)	UK	Cross-sectional	1031	Internet offenders were more able to identify with fictional characters, had higher scores on under assertiveness and motor impulsivity.	JBI, low
Elliott et al. (2012)	UK	Cross-sectional	1128	Internet offenders had fewer deficits than mixed offenders, and fewer victim empathy distortions than contact and mixed offenders. Internet and mixed offenders shared similar traits and could relate with fictional characters.	JBI, low
Endrass et al. (2009)	Switzerland	Follow-up	231	CAI offenders were less likely to be married and have previous convictions. Low recidivism rates.	JBI, low
Faust et al. (2015)	US	Follow-up	638	CAI offenders had fewer prior convictions, lower rates of recidivism and less likely to have substance use problems compared to contact offenders.	JBI, low
Garman et al. (2021)	US	Qualitative	9	CAI offenders minimised the seriousness and	CASP, medium

				harm of viewing CAI and did not believe it was wrong, as they did not produce it. Offenders noted they were addicted to the material.	
Henry et al. (2010)	UK	Cross-sectional	422	Online offenders were characterised by low self-esteem and loneliness, with some holding pro-offending attitudes.	JBI, low
Henshaw et al. (2018)	Australia	Cross-sectional	1205	CAI offenders had low rates of offending and high rates of sexual deviance.	JBI, low
Jung et al. (2013)	Canada	Follow-up	196	CAI offenders displayed less warmth and had fewer prior convictions than contact and other sexual offenders	JBI, low
Kettleborough & Merdian (2017)	UK	Qualitative	16	CAI offenders did not see children in the images as “real” or consider CAI consumption harmful. Some enjoyed collecting and sorting images or doing something illegal while others reported addiction to CAI. CAI said to elicit positive emotions or, a manifestation of preference for sexually deviant content.	CASP, medium
Knack et al. (2020)	Canada	Qualitative	20	CAI offenders had difficulties maintaining and establishing relationships and had sexual interest in taboo topics. CAI consumption reduced emotional pain.	CASP, low
Kuhle et al. (2016)	Germany	Cross-sectional	190	CAI offenders’ sexual preoccupation increased risk of offending against children.	JBI, low
Laulik et al. (2007)	UK	Cross-sectional	30	CAI offenders displayed a rejecting and submissive interpersonal style and were	JBI, low

				depressed, withdrawn, isolative, and felt misunderstood by others. Lack of warmth enabled them to objectify children.	
Long et al. (2016)	UK	Cross-sectional	374	CAI offenders had fewer previous convictions than mixed offenders and were less likely to produce CAI.	JBI, low
Magaletta et al. (2014)	US	Cross-sectional	541	CAI offenders had more deficits in interpersonal functioning and mood regulation than other offenders.	JBI, low
McManus et al. (2015)	UK	Cross-sectional	244	CAI offenders possessed more CAI and extreme pornography than mixed offenders. CAI offenders were more likely to provide full or partial admissions in interviews.	JBI, low
Merdian et al. (2018)	New Zealand	Cross-sectional	68	CAI offenders were characterised by social exclusion, escapism, and attributing emotional significance to CAI. They were fantasy driven.	JBI, low
Merdian et al. (2020)	UK	Qualitative	20	CAI offenders sexually interested in children, had low self-esteem, lonely, rejected, difficulties connecting with others, and adverse childhood experiences. Perceived themselves as addicted to pornography and used CAI to cope with negative emotions. Justified CAI offending as doing no harm. They felt desensitized to traditional pornography, and the illegal nature of CAI was exciting.	CASP, low
Middleton et al. (2006)	England	Cross-sectional	72	Pathway most linked to online sex offenders was intimacy deficit (emotional loneliness), followed	JBI, low

	and Wales			by emotional dysregulation (difficulties coping with negative emotions). Low levels of empathic concern.	
Morgan & Lambie (2019)	New Zealand	Qualitative	12	CAI offenders felt isolated, lonely, bullied, rejected, and had low self-esteem, difficulties expressing emotions and communicating.	CASP, low
Neutze et al. (2010)	Germany	Cross-sectional	137	CAI offenders were distressed by their fantasies and met the criteria for paedophilia.	JBI, low
Paquette & Cortoni (2021)	Canada	Cross-sectional	241	CAI offenders showed greater support for sexual abuse of children compared to non-sexual offenders and were sexually interested in children. They showed more interest in extrafamilial sexual abuse of children and more interest in sexual incest with boys compared to contact offenders. Coped by consuming CAI.	JBI, low
Paquette & Fortin (2021)	Canada	Cross-sectional	137	CAI offenders saw the internet as uncontrollable, were sexually interested in children and preoccupied with sex, used sex as coping, and sexualised children.	JBI, low
Paquette et al. (2022)	Canada	Cross-sectional	98	Sexual interest towards children was linked with relationship difficulties, sexual preoccupation, belief in a dangerous world, and sexualisation of children. Sexual preoccupation was linked with boredom/loneliness and previous convictions.	JBI, low
Price et al. (2015)	New Zealand	Cross-sectional	46	CAI offenders displayed difficulties in social interaction, self-injurious behaviour, and had few friends. They often had no previous convictions	JBI, low

				or history of abuse or neglect.	
Qualye et al. (2000)	Ireland	Case study	1	The CAI offender felt unattractive to females, had few social relationships, and limited sexual experience. Believed that some children could consent to sexual activity with adults.	CASP, high
Ray et al. (2013)	US	Cross-sectional	175	CAI offenders had intimacy deficits. Some were more inclined to criminal behaviour online due to sensation seeking.	JBI, low
Reijnen et al. (2009)	The Netherlands	Cross-sectional	134	CAI offenders were socially isolated, introverted, and lacked social skills. They displayed lower levels of impulsivity and thrill seeking.	JBI, low
Schulz et al. (2017)	Germany, Sweden, Finland	Cross-sectional	2828	Those soliciting adults and children sexually online displayed social anxiety, loneliness, and problematic internet use.	JBI, low
Seto & Eke (2017)	Canada	Cross-sectional	286	CAI offenders volunteered with children and had a longstanding interest in children.	JBI, low
Seto et al. (2012)	Canada	Cross-sectional	396	CAI offenders were less likely to reoffend but had undetected contact offences. Difficulties with relationships, deviant sexual preferences, and sexual preoccupation.	JBI, low
Seigfried-Spellar (2014)	US	Cross-sectional	273	CAI distributors were more extroverted than those who viewed/downloaded. Those who exchanged CAI were more impulsive-seeking and scored higher on conscientiousness than viewers, suggesting those who distributed were	JBI, low

				more sophisticated.	
Smid et al. (2015)	Netherlands	Cross-sectional	150	CAI offenders with prior contact offences were more likely to commit further ones and had more previous convictions. Possessed extreme pornography. Previous contact offences were disclosed during investigations.	JB1, low
Soldino et al. (2019)	Spain	Cross-sectional	347	CAI offenders had fewer convictions and had low recidivism rates. They were less likely to admit their interest in children than mixed offenders.	JB1, low
Steely et al. (2018)	US	Qualitative	25	CAI offenders felt isolated, lonely and had low self-esteem. They were attracted to minors and the taboo/illegal nature of material. Perceived themselves to be addicted to pornography.	CASP, low
Surjadi et al. (2010).	The Netherlands	Cross-sectional	43	Avoidance of real life enhanced the use of CAI. Most masturbated to CAI, indicating possible sexual interest in children.	JB1, low
Tomak et al. (2009)	US	Cross-sectional	152	Internet offenders were less deviant and impulsive than other sex offenders.	JB1, low
Webb et al. (2007)	UK	Follow-up	210	Internet offenders had more contact with mental health services, fewer live in relationships, and more difficulties with sexual self-regulation compared to contact offenders.	JB1, low

Results of Thematic Analysis

The analysis yielded seven superordinate themes, as follows:

Theme 1: Cognitive Distortions (13 articles, 30%).

There was a consensus across the articles that online offenders frequently displayed cognitive distortions when discussing their victims and offences. Interestingly, Elliott et al. (2009) noted that online offenders had fewer cognitive distortions than contact offenders. This theme was comprised of three subordinate themes, as follows:

Subordinate Theme 1: Harm Minimisation and Wide Availability.

Offenders reported they did not harm the children, as they did not produce the material, and it was widely available online (Garman et al., 2021; Merdian et al., 2020; Quayle et al., 2000). Wide availability suggested to offenders that it was not illegal, which made it easier to justify their actions (Garman et al., 2021; Merdian et al., 2020; Steely et al., 2018). As they did not have direct contact with the child, their consumption of child abuse images was considered harmless or victimless by them (Kettleborough & Merdian, 2017; Steely et al., 2018).

Subordinate Theme 2: Children as Sexual Agents.

Some offenders considered children to be sexual agents (Paquette et al., 2022), and therefore willing and complicit in the production of sexual imagery (Garman et al., 2021). Further, some believed that children had the capacity to consent to being in a relationship with an adult (Kettleborough & Merdian, 2017; Paquette & Fortin, 2021), and wanted to be sexually active (Quayle et al., 2000). This resulted in some placing emotional significance on their offending (Merdian et al., 2018; Paquette & Fortin, 2021).

Subordinate Theme 3: Fantasy Driven.

Some offenders viewed children as actors or relatable fictional characters (Elliott et al., 2009, 2012). Indeed, such offenders found the fantasy of abusing a child arousing (Knack et al., 2020), with the material perceived as fake (Paquette et al., 2022). Thus, they did not see the children as real or as connected to their reality (Kettleborough & Merdian, 2017; Merdian et al., 2020; Morgan & Lambie, 2019). These offenders were more likely to deny an interest in children (Soldino et al., 2019).

Theme 2: Difficulties with Relationships (11 articles, 26%).

Participants believed they had deficient social skills and difficulties in their relationships. This was comprised of two subordinate themes, as follows:

Subordinate Theme 1: Intimate Relationships.

Offenders reported being unable to attract a partner due to deficient social skills and problems in their capacity for relationship stability (Seto et al., 2012). However, for those who were in a relationship, there was a lack of intimacy, which resulted in an overreliance on pornography (Garman et al., 2021; Knack et al., 2020; Merdian et al., 2020; Quayle et al., 2000). This could be a result of them being sexually immature, having little experience with relationships,

and perceiving women as untrustworthy and unapproachable (Morgan & Lambie, 2019; Paquette & Fortin, 2021; Webb et al., 2007). Further, the noted difficulty in relationships was linked with a sexual interest in children (Paquette et al., 2022) and sexual dysfunctions or intimacy deficits (Knack et al., 2020; Merdian et al., 2018; Price et al., 2015).

Subordinate Theme 2: Non-Intimate Relationships.

In addition to having difficulties in intimate relationships, participants noted difficulties with relationships in general (Price et al., 2015). For some, this stemmed from childhood, where they had a conflictual home life, poor relationships with family members, or difficulties finding friends (Burgess et al., 2012; Merdian et al., 2020; Morgan & Lambie, 2019).

Theme 3: Managing Isolation, Loneliness and Boredom (17 articles, 40%).

Those who accessed child abuse images were introverted, submissive, and under assertive in their interactions with others (Laulik et al., 2007; Magaletta et al., 2014; Seigfried-Spellar, 2014). Participants noted that they felt isolated and lonely because of a lack of communication and intimacy in their lives (Knack et al., 2020). This was linked with boredom and time spent unoccupied, which influenced the amount of time spent watching abusive images. That is, when they felt bored and lonely, they turned to abusive images (Bates & Metcalf, 2007; Henry et al., 2010; Knack et al., 2020; Laulik et al., 2007; Merdian et al., 2020; Quayle et al., 2000; Reijnen et al., 2009; Steely et al., 2018).

The loneliness experienced influenced the amount of time spent watching online child abuse images and engaging with this 'community' of users, as they felt part of a community when others listened to them and paid them attention (Garman et al., 2021). There became an overreliance on the internet community, as they felt rejected and socially isolated in their personal lives (Armstrong & Mellor, 2016; Middleton et al., 2006; Price et al., 2015; Reijnen et al., 2009; Schulz et al., 2015). Thus, they accessed child abuse images to escape from their real-world problems and stressors (Magaletta et al., 2014; Surjadi et al., 2010), as interacting sexually online reduced loneliness and boredom (Bergen et al., 2015).

Theme 4: Psychological Traits Connected to Low Self-Worth, Poor Psychological Health and Impulse Challenges (23 articles, 53%).

Offenders reported low self-esteem and feelings of worthlessness (Armstrong & Mellor, 2016; Garman et al., 2021; Henry et al., 2010; Merdian et al., 2020; Steely et al., 2018), which for some stemmed from being rejected during childhood (Merdian et al., 2020), and this influenced how much time they spent watching child abuse images (Merdian et al., 2020). Whether internet offenders have higher rates of contact with the mental health system was unknown, although Webb et al. (2007) suggested higher rates of internet offenders in the mental health system than contact offenders. However, this was not found by Henshaw et al. (2018). Nevertheless, several offenders received diagnoses of depression and anxiety disorders (Knack et al., 2020; Laulik et al., 2007; Magaletta et al., 2014; Price et al., 2015; Quayle et al., 2000; Schulz et al., 2015). Some also noted suicidal behaviour (Laulik et al., 2007; Price et al., 2015). Mixed findings were shared in relation to substance use difficulties, with Clevenger et al., (2016) identifying increased difficulties, whereas Faust et al. (2015) and Long et al. (2016) reporting fewer difficulties with substances than contact offenders.

Offenders were noted to be less warm, have less empathic concern, and be less nurturing (Jung et al., 2013; Middleton et al., 2006). Furthermore, some described online offenders as impulsive and sensation seeking, and to have less awareness of risky situations, putting themselves in danger of further offending behaviour (Eke et al., 2011; Neutze et al., 2012; Ray et al., 2014). Engaging in an illegal act induced a sense of excitement (Kettleborough & Merdian, 2017; Merdian et al., 2020). This was found to influence the amount of time spent watching child abuse images (Ray et al., 2014) and the severity of the images accessed (Seigfried-Spellar, 2014). However, Reijnen et al. (2009), conversely, noted that those downloading images were less impulsive and thrill seeking.

Theme 5: Interest in Deviant Sexual Material (8 articles, 19%)

Deviant sexual material refers to non-traditional or illicit pornographic material (e.g., bestiality, incest, sadism) that is morally prescribed as abnormal or ‘taboo’, and in certain circumstances, illegal. There was broad agreement across the extant literature base that an interest in deviant sexual material constituted a strong predictor for the later access and use of child abuse images materials. More informatively, the included studies described a process wherein a gradual desensitisation towards traditional forms of pornography (i.e., consenting adults) precipitated and then motivated individual’s search and use of more extreme or taboo materials (e.g., non-consensual, voyeurism; Endrass et al., 2009; Knack et al., 2020; McManus et al., 2015; Merdian et al., 2020; Smid et al., 2015; Quayle et al., 2000; Steely et al., 2018). According to researchers, this search for extreme forms of pornography often culminated in the access and use of child abuse materials, which served the dual purpose of providing a stimulus capable of physically arousing the individual (Knack et al., 2020), and satisfying their thrill or sensation seeking tendencies via the violation of moral norms (Garman et al., 2021; Steely et al., 2018; Quayle et al., 2000).

Theme 6: Child Abuse Images as Reinforcing for Emotions (5 articles, 12%)

There was consensus that accessing child abuse images has a reinforcing emotional component. This acted via two discrete affect pathways: (a) Removal of aversive emotional states (Subordinate Theme 1), and (b) Supplementation of pleasurable states (Subordinate Theme 2). These are described as follows:

Subordinate Theme 1: Removal of aversive emotional states.

This represents negative reinforcement. Studies noted that a subset of offenders used child abusive materials to (1) cope with, dissipate or soothe negative emotions (Knack et al., 2020; Merdian et al., 2018), (2) escape from daily stressors (Knack et al., 2020), and/or (3) fill an emotional void (Garman et al., 2021). For these individuals, the removal of an aversively valenced emotion acted to negatively reinforce the target behaviour – i.e., the use of child abuse images.

Subordinate Theme 2: Supplementation of pleasurable states.

In contrast to Subordinate Theme 1, for a subset of offenders the use of child abuse images acted to (1) induce positive emotions and pleasurable feelings (Merdian et al., 2020), (2) stimulate feelings of belongingness (Kettleborough & Merdian, 2017), and/or (3) satisfy sexual desires and urges (Garman et al., 2021). Converse to the above, in these cases the

supplementation of a pleasurable emotion acted to positively reinforce use of child abuse images.

Theme 7: Developing a Hyper Fixation and Preoccupation with Sex (9 articles, 21%).

Hyper fixation to and preoccupation with any form of sex, sexual interaction or pornographic material was considered a common risk indicator (Paquette & Cortoni, 2021) for the later access and use of child abuse images. Offenders described being addicted to both the ritualistic process of searching and accessing illicit materials (Garman et al., 2021; Kettleborough & Merdian, 2017; Morgan & Lambie, 2019; Seto et al., 2012), as well as the physical sensations of arousal and sexual gratification derived from the use of such material (Tomak et al., 2009). Interestingly, researchers outlined a process whereby a fixation or obsession with certain forms of adult or legal pornography acted to inhibit an individual's self-regulatory capabilities leading to a hyper fixation or preoccupation with sex (Garman et al., 2021; Knack et al., 2020; Kuhle et al., 2016; Webb et al., 2007). When traditional forms of pornography ceased to alleviate this fixation, offenders turned towards more extreme or taboo forms of material (e.g., child abuse images) to satisfy their base urges (Morgan & Lambie, 2019; Seto & Eke, 2017; Steely et al., 2018).

Protective characteristics

Examination of the existing evidence base showed there was little research or consideration given to elucidating factors that may protect or insulate vulnerable individuals from online sex offending, and, in particular, child abuse offences, which is why this could not be labelled as a theme. Indeed, most research sought to frame online offending as preventative or protective against contact offences (Elliot et al., 2009; Knack et al., 2020; Quayle et al., 2000). Those studies that did consider protective characteristics highlighted that an active social life (Merdian et al., 2020), together with physical, emotional, and sexual satisfaction within an intimate relationship (Morgan & Lambie, 2019) afforded some protective function. However, the exact magnitude or strength of this protective buffer remains unknown, with the overall conclusion being an absence of research from which to draw even tentative conclusions.

Discussion

The systematic review revealed seven risk factors, as follows: evidence of cognitive distortions; difficulties with relationships; isolation, loneliness, and boredom; psychological traits connected to low self-worth, poor psychological health, and impulse challenges; interest in deviant sexual material; child abuse images as reinforcing for emotions; and developing a hyper-fixation and preoccupation with sex. These factors arguably increase the risk of committing an online sexual offence, although the impact of how they *cumulatively* add to risk is not yet captured in the literature. What is apparent, however, is that online offending is the product of a *process* of various factors emerging, cumulating and/or being reinforced. The concept of online offending as a dynamic process is a clear contribution made by the current review. Equally, the literature fails to capture a role for protective factors, certainly not beyond a rudimentary mention of social engagement and intimacy within a relationship as of potential value. Highlighting the absence of a focus on protective factors is a further contribution of the current review.

Several studies identified cognitive distortions held by online offenders (30%). The most common cognitive distortion was fantasy-driven, characterised by offenders not viewing children as “real”. This was concordant with Briggs et al. (2011), who noted that fantasy-driven individuals are solely motivated by online contact and have no desire for offline contact with a child. These offenders were aroused by the fantasy of abusing a child but have no interest in perpetrating direct abuse (Knack et al., 2020). Additionally, such individuals were less inclined to admit being sexually interested in children (Soldino et al., 2019). The cognitive distortion of seeing children as ‘sexual agents’ was characterised by perceptions that children have the capacity and potentially a desire to be in a sexual relationship with an adult (Kettleborough & Merdian, 2017; Paquette & Fortin, 2021). Some perceived that child abuse images had been obtained with the consent of the child (Garman et al., 2021). This is perhaps due to (1) cognitive distortions regarding harm minimisation, which have been found to be prevalent amongst this offender group, and/or (2) the sheer availability of child abuse imagery content online, suggesting that such material was not illegal (Garman et al., 2021; Merdian et al., 2020; Steely et al., 2018), including to those seeking a means of excusing their behaviour. Additionally, since offenders had no direct contact with their victims, they perceived their crime to be harmless (Kettleborough & Merdian, 2017; Steely et al., 2018). However, these characteristics are difficult to assess and how an individual is categorised based on them creates challenges. An offender could fit into more than one category, and they may share similar traits (Broome et al., 2018). Thus, it equally highlights the fallacy of adopting a category-driven approach to trying to understand these offenders, the group is a heterogeneous one where clear and distinct categories are arguably unlikely to emerge. It also appears that several cognitive distortions may work in either isolation or combination to increase the risk of future or continued online abuse, adding further to the potential role of cumulative risk when describing the process by which risk factors coalesce to lead to offending with this group.

Several studies noted that online offenders had difficulties with both intimate and non-intimate relationships (26%). For some, difficulties establishing relationships was rooted in childhood adversities, characterised by a conflictual home environment and difficulties making friends (Burgess et al., 2012; Merdian et al., 2020; Morgan & Lambie, 2019). This difficulty would also be present in intimate relationships, where they perceived themselves to have insufficient social skills to attract a partner (Seto et al., 2012). Those who managed to form intimate relationships noted that there was a lack of intimacy, or a presence of sexual dysfunction (Garman et al., 2021; Knack et al., 2020; Merdian et al., 2018; Merdian et al., 2020; Price et al., 2015; Quayle et al., 2000). This suggests that, as there are insufficient abilities to form a relationship in person, they seek out others online. This can then lead to the accessing, potentially, of abuse images since there is no risk of rejection.

Connected to this, many of the studies noted that online offenders showed deficits in social functioning (40%), contributing to a lack of socialisation with others and resulting in feelings of loneliness and isolation (Knack et al., 2020), which is consistent with the ITSO (Ward & Beech, 2006). When combined with feelings of boredom, it could lead to unoccupied time being filled with pornography and/or abuse images (Bates & Metcalf, 2007; Henry et al., 2010; Knack et al., 2020; Laulik et al., 2007; Merdian et al., 2020; Quayle et al., 2000; Reijnen et al., 2009; Steely et al., 2018). Interacting with others online, including other offenders, appeared to be fulfilling the human need to connect and be part of a community. Thus, it can be intrinsically reinforcing. Underpinning this were likely to be several factors such as feelings of worthlessness, low mood, and low self-worth and challenges in managing impulses, for some. The level of heterogeneity in this was again well evidenced, although

there was consensus that a degree of underpinning psychological trait was found in most studies. This highlighted value in pursuing these via future research to gain more clarity on their nature and contribution.

Allied to this, an influence of childhood experiences was indicated for some, where low self-worth and poor mental health stemmed from being rejected during childhood (Merdian et al., 2020). Considering again the development of online offending as a process would seem to fit therefore with a more engrained experience, where earlier risk factors (yet poorly understood) may add to this later process of development towards offending. Indeed, it could be argued that there is a catalyst that serves to promote an escalation towards online offending in later years. This could, arguably, be via unresolved feelings of loneliness, continued rejection from others and a lack of meaningful engagement. Equally, it is worth noting how difficulties with impulsivity appeared to be impacting, but particularly in relation to risk awareness. This meant that online offenders were less aware of the risky situations they put themselves in, which resulted in a heightened risk of committing further offences (Eke et al., 2011; Neutze et al., 2012; Ray et al., 2014). For some, the fact that they were committing an illegal act induced a sense of excitement, with this excitement influencing the amount of time spent watching child abuse images (Ray et al., 2014). It thus was acting as a reinforcer. In addition, although there are few offenders who are known to make the transition from online to offline offending, some evidence was found for the fact that online offenders disclose previous contact offences (Seto et al., 2011). However, the magnitude of this finding was insufficient to include as a stand-alone theme and it shows, again, the need for more research into this area.

Interestingly, online offenders were found to show a general interest in deviant sexual material (19%), such as bestiality, sadism, and incest. For many, this interest had gradually increased, as they felt they had become desensitised to traditional forms of pornography (Endrass et al., 2009; Knack et al., 2020; McManus et al., 2015; Merdian et al., 2020; Smid et al., 2015; Quayle et al., 2000; Steely et al., 2018). Once they felt desensitised to these more extreme forms of material, individuals ventured into the realm of child abuse images (Knack et al., 2020). Notably, an escalation in the use of such material may be linked to traits noted in offline offenders, such as deviant sexual arousal, which can increase the risk of committing a sex offence (Ward & Beech, 2016). Thus, it appears that deviant sexual interest is a risk factor for both online and offline offending.

Difficulties with emotional regulation were also noted in a minority of the included studies (12%). Those who accessed child abuse images used this material to cope with negative emotions, such as emotional loneliness or stress (Garman et al., 2021; Knack et al., 2020; Merdian et al., 2018). Likewise, by using such material, they satiated urges, and felt increased belongingness (Kettleborough & Merdian, 2017). As a result of experiencing these positive emotions (Merdian et al., 2020), more time was spent using child abuse material, which may further increase the risk of committing additional sexual offences (Ward & Beech, 2016). This, again, pointed to the reinforcing features of such offending, in that there was evidence for both negative and positive reinforcers that could serve to strengthen future engagement with such abuse material.

Finally, hyper fixation and sexual preoccupation were noted in several articles (21%), and a risk factor for online sexual offending. Again, this was serving to highlight a process by which such fixation and preoccupation developed. It appeared some offenders became desensitised to traditional pornography, which resulted in the access of taboo or extreme

pornographic material, including child abuse images (Morgan & Lambie, 2019; Steely et al., 2018). Again, there was a process of reinforcement clearly indicated and evidence for a compulsive use that was described as an addiction, which is consistent with previous findings (Bourke & Hernandez, 2009). Indeed, problematic internet use has been noted as implicated in the compulsive nature of sexual behaviour (Chen & Jiang, 2020; Mitchell & Wells, 2007) and suggests that what may be emerging is evidence for an impulse disorder, underpinned by several vulnerability and risk factors, as captured in the earlier themes.

Limitations and Future Directions

Though this review provided many insights, there were several limitations. For instance, the search strategy may have been limited by the chosen engines and English language requirements. Most of the articles focused on offenders who committed child offences and thus focus has been limited primarily to this group. The review did seek to highlight protective factors, and certainly succeeded in highlighting their absence. Interestingly, even when noted, protective factors were not the focus of the studies included but appeared to be a finding that simply emerged organically as opposed to being specifically explored. Finally, most studies focused on male perpetrators. This is consistent with the contact offence literature base; whereas it limits any application to women it does at least highlight some challenges with the literature base and in doing so suggests another valuable area for research to pursue.

Implications and Concluding Comments

There are several implications that can be drawn from the findings of this review. The first is perhaps the use of language by researchers, which fails to correctly separate child abuse images from pornography, conflating the two terms. Non-violent pornography is not illegal and nor is there an attempt here to demonise the use of this material. However, child abuse images are illegal and damaging and referring to them as ‘child *pornography*’ fails to recognise the distinction between pornography in a non-violent sense and abusive images. This is an important point to make as the use of terminology is critical and the term ‘abuse’ should be firmly aligned to child abuse imagery and, indeed, adult abuse imagery without confusing this with legal pornography (of which images of children and non-consenting adults, clearly have no place).

In addition, the review identified how there was similarity in the risk factors but also heterogeneity in terms of how these presented across this group of offenders. Acknowledging the risk factors are important but, equally, identifying the development of online *offending as a process* and one that can be positively and/or negatively reinforced becomes an important consideration for assessment and treatment. Put simply, it is argued here that the process by which an individual accesses and then maintains their use of child abuse imagery is likely underpinned by several factors, some from their formative experiences, but it is a process that develops over time. This points to a preventative approach but also a dynamic risk assessment and intervention approach that includes a focus on early identification and intervention to prevent an ingrained and enduring use of such abuse imagery. Although some of the identified risk factors might be similar to the ones identified for offline offenders, this review highlights the differences, such as the motivational variations underpinning online sexual abuse. Clearly, alongside this is a need to identify what protective factors feature across this pathway, pointing not just to protective factors in isolation at a single point in time, but how these can be several factors emerging at various points of the process.

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