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Demographic, mental health, and offending characteristics of online child exploitation material offenders: A comparison with contact-only and dual sexual offenders

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Abstract

Technological advances have dramatically increased the ability to access, distribute and produce child exploitation material (CEM) online, resulting in increased numbers of individuals being charged with CEM offences. This study examined the demographic, mental health, and offending characteristics of CEM offenders (n = 456) in comparison to child contact sexual offenders (n = 493) and offenders with a history of both CEM and contact offences (dual offenders, n = 256). A robust data linkage methodology was employed to link records from statewide corrections services with policing and mental health records in Victoria, Australia. The results indicated that CEM offenders differed from both contact and dual offenders, and that the groups were primarily differentiated based on two factors: antisocial orientation and sexual deviance. CEM offenders demonstrated high rates of sexual deviance but low rates of antisociality, contact offenders exhibited the opposite pattern, and dual offenders had both high sexual deviance and antisociality. The findings suggest that existing sexual offender assessment and treatment frameworks are unlikely to be suitable for exclusive CEM offenders. The implications for future research are discussed.

1 | INTRODUCTION

Since its inception more than 25 years ago, the Internet has become an avenue for accessing sexual and pornographic content (Rissel et al., 2017). Over this time, there has been an exponential growth in the amount of online child exploitation material (CEM; Child Exploitation and Online Protection Centre, 2013; Internet Watch Foundation, 2015) and in the number of individuals coming into contact with the criminal justice system for CEM offences (Brennan, 2012; Motivans & Kyckelhahn, 2007; Queensland Sentencing Advisory Council, 2017). A small but growing body of research is dedicated to understanding the characteristics of CEM offenders. CEM offenders have generally been characterized as highly sexualized, mostly Caucasian men, who are well educated and employed (Henshaw, Ogloff, & Clough, 2017). Almost half (47%) of CEM offenders have been found to have more diverse offending histories (Eke, Seto, & Williams,

2011; Elliott, Beech, Mandeville-Norden, & Hayes, 2009), including a smaller but concerning proportion (*c*. 17%) who also engage in contact sexual offending against children (Seto, Hanson, & Babchishin, 2011). However, rates of historical contact offending have been much higher in self-report studies (up to 58%) (Bourke et al., 2015; Seto et al., 2011). Most offenders have been found to engage in contact offences prior to CEM offending, with low rates of prospective contact offending (up to 6%) demonstrated among exclusive CEM offenders (Faust, Bickart, Renaud, & Camp, 2015; Seto et al., 2011; Seto & Eke, 2015). These nuances in offending trajectories highlight the heterogeneous nature of the overall CEM offender population and offending characteristics, suggesting that the specific risks and needs of this population of offenders may also vary.

1.1 | Comparative characteristics of child sexual offenders

Studies have attempted to understand the unique characteristics of CEM offenders by comparing them with child contact sexual offenders and, more recently, offenders who engage in both CEM and child contact sexual offences (dual offenders). These studies show that CEM offenders differ from contact and dual sexual offenders in several meaningful ways. A recent meta-analysis of 30 studies revealed that CEM, dual and contact offenders could be broadly differentiated on the basis of three key factors: antisocial traits, sexual deviance, and opportunity to offend in either an offline or online context (Babchishin, Hanson, & VanZuylen, 2015). CEM offenders had lower rates of general, violent and sexual offending than both dual and contact offenders. Almost the opposite pattern emerged for variables reflecting a sexual interest in children, with contact offenders least likely and dual offenders most likely to demonstrate paedophilic and hebephilic interests – with CEM offenders in the middle.

Seto, Cantor, and Blanchard (2006) investigated deviant physiological arousal patterns among 685 males and found that CEM offenders (61%) were significantly more likely to meet physiological criteria for paedophilia than were participants with contact (35%) or no offending (22%) histories. They argued that CEM offences were probably a more valid diagnostic indicator for paedophilic interests than contact offences, which is consistent with theories that outline multiple motivational pathways for offline child sexual offending, including deviant sexual interests, antisociality, negative childhood experiences, emotional dysregulation, and intimacy and social skills deficits (Stinson, Sales, & Becker, 2008).

Child exploitation material offenders can be differentiated from dual and contact offenders across several domains, suggesting that they may present with different risks and needs, and thus may warrant different criminal justice responses. However, research is limited in size and scope, with more nuanced questions regarding the risk factors and treatment needs of CEM offenders remaining largely unanswered. Comparative studies have largely been limited to univariate comparisons conducted among small samples of convenience, with few studies utilizing sophisticated statistical analyses that incorporate multiple characteristics in differentiating between groups. Although a few Australian studies have provided basic characterizations of small samples of CEM offenders (Krone et al., 2017; Vasudevan, Ross, Eccleston, & Pradhan, 2015; Warden, 2007), there has been no in-depth comparative investigation of a representative sample of offenders. As such, existing findings require both replication and expansion among a more representative sample prior to definitive assertions being made about the likely characteristics, risk and needs of CEM offenders within the Australian context.

1.2 | The present study

This study investigated the comparative demographic, mental health and offending characteristics of a large cohort of Australian CEM, dual and contact offenders. It was hypothesized that CEM offenders would demonstrate less extensive and varied criminal histories than both contact and dual offenders; higher rates of paraphilia diagnosis than contact offenders, but lower rates than dual offenders; and younger age, higher levels of education and less ethnic diversity than contact offenders, but not dual offenders. In addition, when compared with contact offenders, dual

offenders were expected to be younger in age, more educated, less ethnically diverse and to demonstrate higher rates of paraphilic disorder.

2 | METHOD

2.1 | Sample selection procedure

The sample comprised 1205 individuals charged with either CEM offences or offences involving the direct sexual victimization of children between 2004 and 2014 (inclusive), in Victoria, Australia. Cases with relevant offences were identified from Corrections Victoria, which is responsible for the assessment, management, and treatment of sexual offenders across community and custodial correctional settings within Victoria (Corrections Victoria, 2015). CEM offences included accessing, possessing, controlling, supplying, publicizing, transmitting or producing CEM, or procuring a minor for CEM offences. Child contact offences included rape, indecent assault, incest, sexual penetration of a minor, indecent act with a minor and persistent sexual abuse of a child under the age of 16 years of age.

The sample was divided into three separate groups based on their entire criminal histories: CEM-only offences ('CEM offenders', *n* = 456), child contact offences alone ('contact offenders', *n* = 493) and both CEM and contact offences ('dual offenders', *n* = 256).

2.2 | Data linkage and extraction

This study employed a retrospective data linkage design. A combination of deterministic, probabilistic and manual data matching techniques (for a description of these techniques see Herzog, Scheuren, & Winkler, 2007) was utilized to link the names and birth dates of each offender identified by Corrections Victoria to offending and mental health records maintained by Victoria Police and the Department of Health and Human Services (DHHS), respectively.

2.2.1 | Offending histories

Offending histories were extracted from the state operational policing database, which contains all official notifications received by Victoria Police. The system is updated daily to generate offence statistics based on official police charges (Victoria Police, 2015). Charge histories over a 21-year period were extracted, from the date of implementation of the police database in 1993 until the study end date in June 2014. Incident outcome details were utilized to exclude offences that were unlikely to have proceeded to prosecution or adjudication in court (e.g. complaint withdrawn, no offence disclosed, summons not authorized and caution deleted). Charges with the outcomes of offender processed, intent to summons, unsolved and other were retained for analysis.

Charges were coded into one of 18 different offence types, which were collapsed into five broader offence types for the purposes of statistical analysis (physical violence, sexual violence, intermediate violence, non-violent and other). Sexual offences were further divided into one of six sub-categories (CEM, solicitation, child contact, adult contact, non-contact and child prostitution). Descriptions and examples of each of the general and sexual offence categories are presented in Table 1.

2.2.2 | Mental health histories

Mental health contacts and psychiatric diagnoses were extracted from the Victorian public mental health database for each offender in the sample with a history of contact with the system. The database contains the date, nature and duration of patient contacts with the Victorian public mental health sector, as well as information regarding any psychiatric diagnoses made and any treatment received (DHHS, 2015). Psychiatric diagnoses are recorded in accordance with the framework provided by the *International Classification of Diseases*, 10th Revision (ICD-10; World Health Organization, 2015). The current system was implemented in 2000 and includes comprehensive records dating back to 1990; however, less detailed archived information (spanning the period 1962–1989) was also extracted.

TABLE 1 Offence categories and definitions

Offence type[a]	Definition and examples
Physical violence	Non-sexually motivated offences involving direct physical contact with the victim (e.g. murder, recklessly cause injury) or the immediate threat of direct physical contact (e.g. armed robbery)
Sexual violence	Offences that are discernibly sexual in motive, regardless of physical proximity or medium of offending
CEM	Offences involving accessing, possessing, distributing or producing CEM, as well as the procurement of a minor for the purposes of producing CEM
Solicitation	Offences involving actual or attempted direct sexual engagement with a child over the Internet (e.g. engage in sexual activity with child under 16 using a carriage service, use carriage service to groom child under 16 for sexual act)
Child contact[b]	Offences involving physical sexual exploitation of a child (e.g. indecent assault of a child, sexual penetration) or sexual activity committed in the physical presence of a child (e.g. indecent act, gross indecency)
Adult contact	Offences involving non-consensual sexual activity with an adult victim (e.g. rape, indecent assault) or offences where the victim age could not be reliably determined based on the charge title (e.g. procure for sexual penetration, gross indecency with male)
Non-contact	Offences whereby there was no physical contact with a victim (e.g. wilful and obscene exposure, upskirting) or the victim was not a person (e.g. bestiality)
Child prostitution	Offences involving organized or commercial prostitution of children (e.g. enter agreement for child sex service, cause/induce child to prostitute) in the absence of direct child contact offences
Intermediate violence	Offences involving intimidation that are likely to induce fear in the victim, but do not involve direct physical contact with victims (e.g. blackmail, make threat to kill, stalk another person, discharging missiles)
Non-violent	Offences that neither involved direct physical contact with, nor was likely to induce fear in, victims (e.g. criminal damage, drug possession, fraud, hinder police, burglary, drunk in public place, unlicensed driving).
Breach	Offences involving an official failure to comply with the instructions of a court or the conditions of a community-based or custodial order (e.g. fail to answer bail, escape custody, fail to comply with order/reporting requirements, contravene intervention order)
Other	Miscellaneous category primarily comprising offences involving the covert electronic surveillance of others (e.g. install optical device) or objectionable/indecent material other than CEM (e.g. possess XXX film), as well as a small number of offences that do not clearly fall into any category due to non-specific/ambiguous wording (e.g. attempt to commit indictable offence)

[a]Prior to collapsing into five broader offence types, the original 18 offence categories included homicide, assault and kidnapping offences (physical violence); sexual violence (as indicated); stalking, threat and weapons offences (intermediate violence); drug, property damage, deception, obstruction of justice, theft, breach, public order and traffic offences (non-violent); and surveillance, classification and miscellaneous offences (other).

[b]Incest offences committed by parents or lineal ancestors were also included in this category, based on the assumption that such charges are more likely to be laid in cases of child sexual abuse than in cases involving consenting adults.

Mental health contacts were categorized as one of community (i.e. outpatient), crisis (contacts with crisis assessment and treatment team services as a result of acute mental illness, emotional distress and/or suicidality), or inpatient (admissions to psychiatric hospitals/units) contact types. Psychiatric diagnoses were coded into one of 11 categories,[1] in accordance with classification systems utilized in previous research (Ducat, Ogloff, & McEwan, 2013; Ogloff et al., 2013; Short, Thomas, Luebbers, Ogloff, & Mullen, 2010), including: psychotic (excluding substance-induced), mood (bipolar and depressive disorders), trauma (adjustment and post-traumatic stress disorders), anxiety, personality, substance use, paraphilic, childhood behavioural (conduct disorder, attention-deficit disorder), neurodevelopmental (autism spectrum disorders, intellectual disability) and other disorders (miscellaneous disorders that occurred infrequently, such as eating, sleep, somatic, organic and impulse control disorders). Suicidal ideation and self-harming behaviours were also included as represented by unique diagnostic codes within the ICD-10 (World Health Organization, 2015).

Victorian public mental health services target people with major mental illness (e.g. schizophrenia, major depression or bipolar disorder), severe personality disorder, or people presenting in situational crisis (DHHS, 2011),

whereas most people with high prevalence disorders (e.g. depression or anxiety disorders) are treated in the private sector. Substance use disorder diagnoses are also under-represented in the public sector, as are paraphilias, which are more likely to be identified within specialist forensic or correctional services. Thus, while data drawn from the public mental health database allow for comparisons of relative rates of service utilization and mental disorder across offender groups, they do not represent the full range of mental health needs among the sample.

2.3 | Approach to analysis

Preliminary data screening revealed some missing data among the demographic variables (up to 15.27%) and showed that most continuous variables did not meet the requirements for parametric analysis. As such, group comparisons for continuous variables were undertaken using non-parametric analyses (Kruskal–Wallis and Mann–Whitney *U*-tests), and the impact of missing data was measured by including a specific category for this within all analyses of demographic information. Differences in group frequencies across categorical variables were assessed using χ^2 tests of association, with Fisher's exact tests used where expected cell frequencies fell below 5 across more than 20% of the cells within any given contingency table (Field, 2009). Post hoc comparisons for categorical variables were conducted by evaluating the obtained cell residual values against the unit normal distribution, as described by Beasley and Schumacker (1995), using adjusted residuals in lieu of standardized residuals (Agresti & Kateri, 2013).

Direct multinomial logistic regression analyses were conducted to identify variables with the greatest explanatory power to differentiate CEM, dual and contact offenders. Given the large number of variables examined, separate multinomial regression analyses were initially conducted for each of the variable domains (demographic, offending and mental health), with predictors with the greatest explanatory power being retained for entry into the combined multivariate model presented in this paper. Regression models were generated using an iterative process, whereby predictors with little explanatory power in initial stages were removed from subsequent iterations to improve the overall model (Tabachnick & Fidell, 2007). To avoid the issue of the large sample size producing overly sensitive Pearson and deviance statistics (Hooper, Coughlan, & Mullen, 2008; Tabachnick & Fidell, 2007), the fit of the model was assessed using Wheaton, Muthen, Alwin, and Summers' (1977) normed χ^2 statistic, with values < 2 indicating a well-fitted model (Tabachnick & Fidell, 2007). Classification accuracy was assessed by comparing the percentages classified as correct by the model with the percentages expected to be correct by chance alone, with a model that demonstrated at least a 25% improvement over chance rates being deemed as a useful model (Bayaga, 2010; Tabachnick & Fidell, 2007).

3 | Results

3.1 | Demographic characteristics

Comparisons of demographic characteristics across CEM, dual and contact offender groups are presented in Table 2. Contact offenders were significantly older than both CEM (U = 98 668.00, z = −3.26, p = 0.001, r = −0.106) and dual offenders (U = 53 789.00, z = −3.32, p = 0.001, r = −0.121), and demonstrated significantly higher rates of 'other' ethnicities than expected levels [$\chi^2(1)$ = 16.32, z = 4.04, p < 0.001]. In contrast, significantly fewer CEM offenders than expected identified as an ethnicity other than Australian [$\chi^2(1)$ = 10.18, z = −3.19, p = 0.001]. The significant effect for education was accounted for by significantly fewer CEM offenders than expected within the 'partial secondary or lower' category [$\chi^2(1)$ = 63.52, z = −7.97, p < 0.001], as well as more CEM offenders within the 'completed secondary or higher' category [$\chi^2(1)$ = 13.03, z = 3.61, p < 0.001], while the opposite pattern was true for contact offenders [partial secondary or lower, $\chi^2(1)$ = 35.76, z = 5.98, p < 0.001; completed secondary or higher: $\chi^2(1)$ = 12.67, z = −3.56, p < 0.001].

TABLE 2 Demographic and offending characteristics of child exploitation material (CEM), dual and contact offenders

Characteristic	CEM (n = 456)	Dual (n = 256)	Contact (n = 493)	Comparison statistic
Demographics				
Age at extraction [M (SD), MR]	45.58 (12.67), 577.71_{a}	44.98 (13.51), 558.01_{b}	49.17 (15.68), $649.76_{a, b}$	$H(2) = 15.60$, $p < 0.001$, $\eta^2 = 0.013$
Ethnicity (n, %)				$\eta^2(4) = 29.09$, $p < 0.001$, $V = 0.110$
Australian	380 (83.33)	200 (78.13)	380 (77.08)	
Other	51 (11.18)*	34 (13.28)	101 (20.49)**	
Missing	25 (5.48)	22 (8.59)**	12 (2.43)*	
Education (n, %)				$\chi^2(4) = 76.34$, $p < 0.001$, $V = 0.178$
Partial secondary or less	166 (36.40)*	147 (57.42)	303 (61.46)**	
Completed secondary or higher	182 (39.91)**	86 (33.59)	137 (27.79)*	
Missing	108 (23.68)**	23 (8.98)*	53 (10.75)*	
Offending frequency and versatility				
Age at index [M (SD), MR]	39.91 (12.26), 586.52_{a}	39.13 (13.23), 561.78_{b}	42.72 (15.46), $639.65_{a, b}$	$H(2) = 10.09$, $p = 0.006$, $\eta^2 = 0.008$
Age at first offence [M (SD), MR]	37.56 (13.22), 619.05_{a}	34.02 (13.88), $529.68_{a, b}$	38.75 (16.88), 626.23_{b}	$H(2) = 14.54$, $p = 0.001$, $\eta^2 = 0.012$
Total offences [M (SD), MR]	5.10 (8.74), $409.78_{a, b}$	12.69 (11.40), $819.95_{a, c}$	11.55 (15.75), $669.06_{b, c}$	$H(2) = 260.00$, $p < 0.001$, $\eta^2 = 0.216$
Total sexual offences [M (SD), MR]	1.68 (1.18), $356.55_{a, b}$	6.88 (6.15), $908.81_{a, c}$	5.03 (7.68), $672.16_{b, c}$	$H(2) = 466.14$, $p < 0.001$, $\eta^2 = 0.387$
Offending versatility [M (SD), MR]	2.39 (1.76), $550.05_{a, b}$	3.34 (2.48), 677.97_{a}	3.14 (2.66), 613.05_{b}	$H(2) = 24.30$, $p < 0.001$, $\eta^2 = 0.020$
Sexual offending only (n, %)	153 (33.55)	65 (25.39)*	173 (35.09)	$\chi^2(2) = 7.65$, $p = 0.021$, $V = 0.080$

Note: Mean ranks (MRs) within the same row that share a subscript letter are significantly different from each other at $p \leq 0.017$.

*frequencies that are significantly lower than expected frequencies at $p \leq .017$ (Bonferroni-adjusted);

**frequencies that are significantly higher than expected frequencies at $p \leq 0.017$ (Bonferroni-adjusted).

3.2 | Offending characteristics

3.2.1 | Age at index and first offence

There was substantial variability within the sample for age at index (range 15–79 years, *M* = 40.89, SD = 13.93) and age at first offence (range 10–78 years, *M* = 37.29, SD = 15.05). As shown in Table 2, contact offenders were significantly older at index offence than were both CEM (*U* = 102 173.00, *z* = −2.43, *p* = 0.015, *r* = −0.079) and dual offenders (*U* = 55 267.00, *z* = −2.79, *p* = 0.005, *r* = −0.102). Contact offenders were also found to be significantly older than dual offenders at first offence (*U* = 53 515.00, *z* = −3.41, *p* = 0.001, *r* = −0.125), as were CEM offenders (*U* = 49 187.50, *z* = −3.49, *p* < 0.001, *r* = −0.131).

3.2.2 | Offending frequency

The total number of overall (*M* = 9.35, SD = 13.00, range 1–124), sexual (*M* = 4.15, SD = 6.07, range 1–117) and non-sexual offences (*M* = 5.20, SD = 11.09, range 0–100) was highly variable. Most offenders committed few offences (overall: median = 5.00, mode = 2.00; sexual: median = 2.00, mode = 1.00; non-sexual: median = 1.00, mode = 0.00). As shown in Table 2, CEM offenders had significantly fewer offences compared with dual (*U* = 18 260.00, *z* = −15.31, *p* < 0.001, *r* = −0.574) and contact offenders (*U* = 64 404.50, *z* = −11.46, *p* < 0.001, *r* = −0.372), both of which remained significant when controlling for age [CEM vs. dual: Wald $\chi^2(1) = 63.27$, *p* < 0.001; CEM vs contact: Wald $\chi^2(1) = 54.22$, *p* < 0.001].[2] Although dual offenders were initially found to have a greater number of offences than contact offenders (*U* = 47 673.50, *z* = −5.51, *p* < 0.001, *r* = −0.201), these differences did not remain after controlling for age [Wald $\chi^2(1) = 0.41$, *p* = 0.708].

The same pattern emerged for the total number of sexual offences. CEM offenders again demonstrated significantly fewer sexual offences than was the case for dual (*U* = 6300.00, *z* = −20.48, *p* < 0.001, *r* = −0.768) and contact offenders (*U* = 52 089.50, *z* = −14.91, *p* < 0.001, *r* = −0.484), while dual offenders committed more sexual offences than did contact offenders (*U* = 36 885.00, *z* = −9.41, *p* < 0.001, *r* = −0.344). These effects remained significant after controlling for age [CEM vs. dual: Wald $\chi^2(1) = 167.76$, *p* < 0.001; CEM vs. contact: Wald $\chi^2(1) = 107.31$, *p* < 0.001; dual vs. contact: Wald $\chi^2(1) = 11.54$, *p* = 0.001].

3.2.3 | Offending versatility

Most offenders committed offences across four or fewer of the 18 offence types coded (*n* = 979, 81.24%; mean = 2.90, median = 2.00, mode = 1.00, SD = 2.35), with almost a third (*n* = 391, 32.45%) committing sexual offences exclusively. As shown in Table 2, CEM offenders were significantly less versatile in their offending when compared with both dual (*U* = 45 283.50, *z* = −5.13, *p* < 0.001, *r* = −0.192) and contact offenders (*U* = 101 344.00, *z* = −2.72, *p* = 0.006, *r* = −0.088). This pattern of effects remained when controlling for age [CEM vs. dual: Wald $\chi^2(1) = 30.26$, *p* < 0.001; CEM vs. contact: Wald $\chi^2(1) = 39.81$, *p* < 0.001; dual vs. contact: Wald $\chi^2(1) = 0.75$, *p* = 0.751]. Offenders also differed in terms of their sexual offending exclusivity, with lower rates of exclusive sexual offending than expected among dual offenders [$\chi^2(1) = 7.39$, *z* = −2.72, *p* = 0.006].

3.2.4 | Types of offending

Other than sexual offending, the most common forms of offending were breach (*n* = 519, 43.07%) and non-violent offences (*n* = 456, 37.84%), followed by intermediate violence (*n* = 279, 23.15%), physical violence (*n* = 274, 22.66%) and other offences (*n* = 109, 9.05%). As shown in Table 3, significant effects were detected for all but one general offence type (breach offences). CEM offenders offended at lower than expected frequencies across physical violence [$\chi^2(1) = 66.83$, *z* = −8.18, *p* < 0.001], intermediate violence [$\chi^2(1) = 6.85$, *z* = −2.62, *p* = 0.009] and non-violent offences [$\chi^2(1) = 17.92$, *z* = −4.23, *p* < 0.001]. In contrast, both significant post hoc effects for contact offenders related to offending at higher rates than expected, including physical violence [$\chi^2(1) = 46.72$, *z* = 6.84, *p* < 0.001] and non-violent offences [$\chi^2(1) = 7.35$, *z* = 2.71, *p* = 0.007], while dual offenders were found to offend at

TABLE 3 General and sexual offence types among child exploitation material (CEM), dual and contact offenders

	CEM (*n* = 456)		Dual (*n* = 256)		Contact (*n* = 493)		
Offence	**n**	**%**	**n**	**%**	**n**	**%**	**χ^2 comparison**
General							
Physical violence	46	10.09*	67	26.17	161	32.66**	$\chi^2(2) = 70.87$, $p < 0.001$, $V = 0.243$
Intermediate violence	87	19.08*	91	35.55**	101	20.49	$\chi^2(2) = 28.32$, $p < 0.001$, $V = 0.153$
Non-violent	138	30.26*	109	42.58	209	42.39**	$\chi^2(2) = 17.92$, $p < 0.001$, $V = 0.122$
Breach	210	46.05	113	44.14	196	39.76	$\chi^2(2) = 3.98$, $p = 0.135$
Other	32	7.02	44	17.19**	33	6.69	$\chi^2(2) = 26.22$, $p < 0.001$, $V = 0.148$
Sexual							
Online solicitation	20	4.39	19	7.42**	4	0.81*	$\chi^2(2) = 22.82$, $p < 0.001$, $V = 0.138$
Adult contact	19	4.17*	36	14.06	93	18.86**	$\chi^2(2) = 48.45$, $p < 0.001$, $V = 0.201$
Non-contact	17	3.73	14	5.47	34	6.90	$\chi^2(2) = 4.66$, $p = 0.098$
Child exploitation	2	0.44	8	3.13**	4	0.81	$\chi^2(2) = 11.20$, $p = 0.003$, $V = 0.096$

Note:

*frequencies that are significantly lower than expected frequencies at $p \leq 0.017$ (Bonferroni-adjusted);

**frequencies that are significantly higher than expected frequencies at $p \leq 0.017$ (Bonferroni-adjusted).

significantly higher rates than expected across intermediate violence [$\chi^2(1) = 28.06$, $z = 5.30$, $p < 0.001$] and other offences [$\chi^2(1) = 26.19$, $z = 5.11$, $p < 0.001$].

Alongside their target offences (i.e. CEM or child contact offences), an eighth of the sample (*n* = 148, 12.28%) had also committed contact sexual offences against adults, while non-contact (*n* = 65, 5.39%), online solicitation (*n* = 43, 3.57%) and child prostitution offences (*n* = 14, 1.16%) were less common. Table 3 shows small, but significant, effects for all but one sexual offence type. Contact offenders demonstrated higher than expected rates of adult contact sexual offending [$\chi^2(1) = 33.55$, $z = 5.79$, $p < 0.001$], while CEM offenders were less likely to commit adult contact offences than expected [$\chi^2(1) = 44.85$, $z = -6.70$, $p < 0.001$]. Dual offenders demonstrated higher rates of both solicitation [$\chi^2(1) = 14.03$, $z = 3.75$, $p < 0.001$] and child prostitution offending than expected [$\chi^2(1) = 10.91$, $z = 3.30$, $p = 0.001$], while significantly fewer contact offenders engaged in solicitation offences than expected [$\chi^2(1) = 18.43$, $z = -4.29$, $p < 0.001$].

3.3 | Mental health characteristics

3.3.1 | Nature and frequency of contacts

Almost one-third of offenders received public mental health services, with the number of contacts varying substantially between 0 and 1058 ($M = 17.72$, SD = 77.47) among the sample. Most offenders received community-based treatment (*n* = 326, 27.05%), while smaller proportions of the sample came into contact with crisis (*n* = 190, 15.77%) or inpatient services (*n* = 144, 11.95%). As reported in Table 4, CEM offenders came into contact with the system at a lower rate than expected [$\chi^2(1) = 11.49$, $z = -3.39$, $p = 0.001$] and demonstrated fewer overall contacts compared with contact sexual offenders ($U = 103\,389.00$, $z = -2.66$, $p = 0.008$, $r = -0.086$). The same pattern was detected for crisis services [CEM offenders: $\chi^2(1) = 11.16$, $z = -3.34$, $p = 0.001$; CEM vs. contact: $U = 104\,493.00$, $z = -2.99$, $p = 0.003$, $r = -0.097$] and psychiatric admissions [CEM offenders: $\chi^2(1) = 8.07$, $z = -2.84$, $p = 0.005$; CEM vs. contact: $U = 104\,980.00$, $z = -3.12$, $p = 0.001$, $r = -0.101$]. In addition, the rate of psychiatric admissions among contact offenders was significantly higher than expected [$\chi^2(1) = 8.47$, $z = 2.91$, $p = 0.004$].

TABLE 4 Mental health characteristics of child exploitation material (CEM), dual and contact offenders

	CEM (*n* = 456)	Dual (*n* = 256)	Contact (*n* = 493)	Comparison statistic
Contacts				
Any contact (*n*, %)	122 (26.75)*	94 (36.72)	177 (35.90)	$\chi^2(2) = 11.51$, $p = 0.003$, $V = 0.098$
Total number [*M*, (SD), MR]	14.80 (62.90), 574.30_a	13.93 (52.47), 617.13	22.39 (97.79), 622.21_a	$H(2) = 7.72$, $p = 0.022$, $\eta^2 = 0.006$
Community contacts				
Any (*n*, %)	108 (23.68)	74 (28.91)	144 (29.21)	$\chi^2(2) = 4.23$, $p = 0.120$
Total number [*M*, (SD), MR]	10.39 (48.39), 582.14	11.08 (48.49), 615.83	17.38 (81.75), 615.63	$H(2) = 4.31$, $p = 0.120$
Crisis intervention				
Any (*n*, %)	52 (11.40)*	44 (17.19)	94 (19.07)	$\chi^2(2) = 10.97$, $p = 0.004$, $V = 0.095$
Total number [*M*, (SD), MR]	3.02 (13.54), 578.94_a	2.38 (8.58), 610.28	3.10 (14.70), 621.48_a	$H(2) = 9.15$, $p = 0.011$, $\eta^2 = 0.008$
Admissions				
Any (*n*, %)	39 (8.55)*	30 (11.72)	75 (15.21)**	$\chi^2(2) = 10.00$, $p = 0.007$, $V = 0.091$
Total number [*M*, (SD), MR]	0.19 (0.88), 582.79_a	0.24 (1.01), 601.16	0.39 (1.99), 622.65_a	$H(2) = 9.83$, $p = 0.006$, $\eta^2 = 0.008$
Diagnoses (*n*, %)				
Psychotic	8 (1.75)[a]	9 (3.49)	23 (4.67)	$\chi^2(2) = 6.29$, $p = 0.05$, V = 0.072
Mood	38 (8.33)	28 (10.94)	53 (10.75)	$\chi^2(2) = 1.97$, $p = 0.374$
Trauma	47 (10.31)	37 (14.45)	56 (11.36)	$\chi^2(2) = 2.80$, $p = 0.253$
Anxiety	8 (1.75)	6 (2.34)	9 (1.83)	$\chi^2(2) = 0.34$, $p = 0.892$
Personality	20 (4.39)	13 (5.08)	29 (5.88)	$\chi^2(2) = 3.02$, $p = 0.222$
Substance use	28 (6.14)	19 (7.42)	45 (9.12)	$\chi^2(2) = 0.22$, $p = 0.902$
Paraphilic	19 (4.17)	22 (8.59)**	14 (2.84)*	$\chi^2(2) = 13.07$, $p = 0.001$, V = 0.104
Childhood behavioural	9 (1.97)	11 (4.30)	13 (2.64)	$\chi^2(2) = 3.36$, $p = 0.173$
Neurodevelopmental	7 (1.54)	5 (1.95)	11 (2.23)	$\chi^2(2) = 0.62$, $p = 0.738$
Other	11 (2.41)	9 (3.52)	23 (4.67)	$\chi^2(2) = 3.50$, $p = 0.183$
Suicidal ideation and self-harm	15 (3.29)	9 (3.52)	19 (3.85)	$\chi^2(2) = 0.22$, $p = 0.902$

Note: Mean ranks (MRs) within the same row that share a subscript letter are significantly different from each other at $p \leq 0.017$.

*denotes frequencies that are significantly lower than expected frequencies at $p \leq 0.017$ (Bonferroni-adjusted);

**denotes frequencies that are significantly higher than expected frequencies at $p \leq 0.017$ (Bonferroni-adjusted).

[a]Trend approaching Bonferroni-adjusted significance value of $p < 0.017$.

3.3.2 | Psychiatric diagnoses

Most offenders with a public mental health record received a psychiatric diagnosis (n = 335, 85.24%), with half of those diagnosed receiving more than one diagnosis type (n = 176, 52.54%). Disorders within the trauma category were the most commonly diagnosed (n = 140, 11.62% of the sample), followed by mood (n = 119, 9.88%), substance use (n = 92, 7.63%), personality (n = 62, 5.15%) and paraphilic (n = 55, 4.56%) disorders. As shown in Table 4, most disorders and clinical features (e.g. suicidal ideation and self-harm) were observed at similar rates among CEM, dual and contact offenders, and did not deviate markedly from expected frequencies. The one exception was paraphilic disorders, which occurred more frequently among dual offenders than expected [$\chi^2(1) = 12.11$, $z = 3.48$, $p = 0.001$] and less frequently among contact offenders than expected [$\chi^2(1) = 5.71$, $z = -2.39$, $p = 0.017$]. Although significant at the omnibus level, post hoc effects for psychotic disorders did not reach statistical significance after applying the Bonferroni correction [$\chi^2(1) = 5.62$, $z = -2.37$, $p = 0.018$].

3.4 | Multivariate model for offender group membership

Iterative multinomial logistic regression analyses were conducted across the demographic, mental health and offending variable domains. Variables with the greatest explanatory power within each of these preliminary models were retained for entry into the combined multivariate model. Variables were screened for multicollinearity, linearity of the logit, and adequacy of expected frequencies prior to conducting each logistic regression analysis, using the comprehensive methods outlined by Field (2009) and Tabachnick and Fidell (2007). One variable (total sexual offences) was found to violate the assumption of linearity. This was retained, however, due to its theoretical importance and significant predictive effect within the initial offending model, with the acknowledgement that this would probably reduce the power of the model to detect a relationship between this and the outcome variable (Statistics Solutions, 2016). Examination of correlation matrices, eigenvalues, tolerance and variance inflation factor statistics also revealed multicollinearity among two pairs of predictors. Collinearity diagnostics were improved following the removal of age at extraction, which was excluded based on lesser theoretical importance. Following the data-screening process, 12 variables were retained for entry into the model: ethnicity, education, age at first offence, total sexual offences, offence versatility, sexual offences only, physically violent offending, intermediate violent offending, other offences, adult contact sexual offences, mental health contact and paraphilia diagnosis.

An initial iteration of the model was statistically significant [$\chi^2(28) = 648.54$, $p < 0.001$, Nagelkerke $R^2 = 0.473$]. Most predictors significantly contributed to the model (p <.001), with the exception of mental health contact [$\chi^2(2) = 0.15$, $p = 928$] and adult contact offences [$\chi^2(2) = 5.24$, $p = 0.073$]. As such, a second iteration of the model was conducted without these variables, with the model remaining significant [$\chi^2(24) = 643.12$, $p < 0.001$]. Tables 5–7 show the variable parameter estimates, odds ratios and 95% confidence intervals for each group comparison within the final model. The final model demonstrated an adequate fit (Pearson ratio n = 1.70; deviance ratio n = 0.83), with all 10 predictors contributing significantly ($p \leq 0.001$). An approximate measure of model strength indicated that the model accounted for approximately 47.00% of the variation in offender type (Nagelkerke R^2). Classification was adequate, meeting the 25% chance improvement criterion, both overall (n = 775, 64.32%) and across all three groups. Classification was most accurate for CEM offenders (n = 380, 83.33%), followed by contact offenders (n = 324, 65.72%), and dual offenders (n = 71, 27.73%). Most incorrectly classified dual offenders were misclassified as contact offenders (n = 154, 60.16%) as opposed to CEM offenders (n = 31, 12.11%).

3.4.1 | CEM versus contact offenders

Almost all predictors were found to significantly differentiate CEM from contact offenders (see Table 5). Being Australian in ethnicity and of higher education decreased the odds of being a contact offender relative to a CEM offender, as did having missing data across either of the two demographic variables. In contrast, increases in both the total number of sexual offences committed and offending versatility resulted in increased odds of being a contact

TABLE 5 Summary of logistic regression analysis predicting offender group on the basis of combined demographic, offending and mental health variables: contact offender versus child exploitation material (CEM) offender

	B	SE	Wald statistic	p	OR	95% CI
Contact vs. CEM						
Intercept	−3.54	0.91	15.01	**< 0.001**	–	–
Australian ethnicity	−0.69	0.23	9.33	**0.002**	0.50	0.32–0.78
Missing ethnicity	−1.51	0.47	10.14	**0.001**	0.22	0.09–0.56
Higher education	−0.67	0.18	13.45	**< 0.000**	0.51	0.36–0.73
Missing education	−0.70	0.23	9.43	**0.002**	0.50	0.32–0.78
Age at first offence	0.01	0.01	5.48	0.019	1.02	1.00–1.03
Total sexual offences	0.79	0.06	155.28	**< 0.001**	2.20	1.95–2.49
Offence versatility	0.27	0.07	14.07	**< 0.001**	1.31	1.14–1.51
Sexual offences only	−0.80	0.21	14.78	**< 0.001**	2.22	1.48–3.33
Violence	−1.26	0.27	22.50	**< 0.001**	3.51	2.09–5.88
Intermediate violence	1.18	0.28	18.06	**< 0.001**	0.31	0.18–0.53
Other offences	0.53	0.36	2.24	0.134	0.59	0.29–1.18
Paraphilia diagnosis	1.42	0.45	9.89	**0.002**	0.24	0.10–0.58

Note: CI = confidence interval for odds ratio (OR). Reference group is CEM. Bold-face *p*-values are significant at $p \leq 0.017$ (Bonferroni-adjusted).

offender, as did committing sexual offences exclusively and having a history of violent offending. Finally, the absence of both intermediate offences and paraphilic disorder decreased the odds of being a contact offender relative to a CEM offender. Outside of the missing data variables, which yielded the largest odds ratio, paraphilia diagnosis, history of violence and history of intermediate violence offences were the strongest predictors of group membership among CEM and contact offenders.

TABLE 6 Summary of logistic regression analysis predicting offender group on the basis of combined demographic, offending and mental health variables: dual offender versus child exploitation material (CEM) offender

	B	SE	Wald statistic	p	OR	95% CI
Dual vs. CEM						
Intercept	−0.68	0.98	0.48	0.488	–	–
Australian ethnicity	−0.38	0.27	1.89	0.169	0.69	0.40–1.17
Missing ethnicity	0.03	0.46	0.01	0.984	1.03	0.42–2.54
Higher education	−0.52	0.21	6.15	**0.013**	0.59	0.39–0.90
Missing education	−0.79	0.29	7.21	**0.007**	0.45	0.26–0.81
Age at first offence	−0.01	0.01	2.48	0.115	0.99	0.97–1.00
Total sexual offences	0.82	0.06	166.05	**< 0.001**	2.28	2.01–2.58
Offence versatility	0.08	0.08	0.96	0.327	1.08	0.93–1.26
Sexual offences only	−0.45	0.25	3.27	0.071	1.56	0.96–2.54
Violence	−0.78	0.31	6.51	**0.011**	2.18	1.20–3.98
Intermediate violence	0.10	0.29	0.12	0.733	0.91	0.52–1.59
Other offences	−0.65	0.34	3.64	0.056	1.91	0.98–3.72
Paraphilia diagnosis	0.13	0.43	0.08	0.773	0.88	0.38–2.07

Note: CI = confidence interval for odds ratio (OR). Reference group is CEM. Bold-face *p*-values are significant at $p \leq 0.017$ (Bonferroni-adjusted).

TABLE 7 Summary of logistic regression analysis predicting offender group on the basis of combined demographic, offending and mental health variables: Dual offender versus contact offender

	B	SE	Wald statistic	p	OR	95% CI
Dual vs. contact						
Intercept	2.86	0.81	12.60	**< 0.001**	–	–
Australian ethnicity	0.32	0.23	1.90	0.168	1.37	0.88–2.14
Missing ethnicity	1.54	0.44	12.47	**< 0.001**	4.65	1.98–10.93
Higher education	0.15	0.19	0.64	0.423	1.16	0.81–1.67
Missing education	−0.09	0.29	0.10	0.757	0.91	0.52–1.61
Age at first offence	−0.03	0.01	16.31	**< 0.001**	0.97	0.96–0.99
Total sexual offences	0.03	0.01	6.07	**0.014**	1.03	1.01–1.06
Offence versatility	−0.20	0.06	10.34	**0.001**	0.82	0.73–0.93
Sexual offences only	0.35	0.22	2.46	0.117	0.71	0.46–1.09
Violence	0.47	0.24	3.79	0.052	0.62	0.39–1.00
Intermediate violence	−1.08	0.25	19.42	**< 0.001**	2.95	1.82–4.78
Other offences	−1.18	0.29	16.76	**< 0.001**	3.25	1.85–5.71
Paraphilia diagnosis	−1.30	0.37	12.57	**< 0.001**	3.66	1.79–7.52

Note: CI = confidence interval for odds ratio (OR). Reference group is contact offender. Bold-face *p*-values are significant at $p \leq 0.017$ (Bonferroni-adjusted).

3.4.2 | CEM versus dual offenders

As shown in Table 6, only four predictors reliably discriminated between CEM and dual offenders. Similar to contact offenders, having a greater number of sexual offences and a history of violent offending increased the odds of being a dual offender relative to a CEM offender. In contrast, the odds of being a dual offender were significantly decreased for those with both higher education backgrounds and missing education information. This latter variable yielded the largest odds ratio within the model, with total sexual offences being the second strongest predictor of group membership among dual and CEM offenders. Non-significant effects were obtained for all remaining variables.

3.4.3 | Dual versus contact offenders

Several predictors discriminated between dual and contact offenders, as detailed in Table 7. An increase in the total number of sexual offences resulted in an increase in odds of being a dual offender, as did having missing ethnicity data, a paraphilia diagnosis and a history of intermediate violence or other offence types. In contrast, both increasing age at first offence and offending versatility were associated with increased odds of being a contact offender rather than a dual offender. Other than the missing ethnicity category, the strongest predictor of group membership was paraphilic diagnosis, followed by other offences and intermediate offences, with the other significant effects typically yielding small odds ratios.

4 | DISCUSSION

This is the first large-scale examination of the comparative characteristics of Australian CEM, dual and contact offenders, contributing to the growing body of international research dedicated to understanding the characteristics of individuals who engage in online CEM offences. Although univariate results revealed that CEM offenders differed from contact and dual offenders across some demographic, offending and mental health characteristics, in the final multivariate model, offenders differed primarily on offending characteristics, with fewer differences identified across the demographic and mental health domains.

The hypotheses regarding demographic factors were partially supported. CEM offenders were younger in age, less ethnically diverse and more educated than contact offenders, supporting prior notions of CEM offenders as higher functioning than traditional offline sexual offenders (Henshaw et al., 2017). However, the educational backgrounds of CEM and dual offenders also differed unexpectedly, with the high rate of missing data potentially impacting on the reliability of this finding. Consistent with the hypotheses, CEM offenders differed from both contact and dual offenders in terms of their less frequent, versatile and violent offending histories. This is consistent with previous studies that have shown fewer offence-supportive beliefs and higher levels of victim empathy among CEM offenders than among both dual and contact offenders (Babchishin et al., 2015; Elliott et al., 2009; Merdian, Curtis, Thakker, Wilson, & Boer, 2014).

In contrast, offenders' mental health and diagnostic backgrounds were largely similar, with rates of overall service utilization being more than three times higher among this sample than among the general Victorian community (11%; Short et al., 2010). The hypotheses regarding sexual deviance were only partially supported. As expected, CEM offenders were more likely than contact offenders to be diagnosed with a paraphilic disorder, despite the low rate of paraphilia diagnosis overall (4.6%). In fact, having a paraphilia diagnosis was one of the strongest predictors of group membership in the final multivariate model, distinguishing both CEM and dual offenders from contact offenders. However, CEM and dual offenders were not distinguished by this diagnosis, as predicted based on the meta-analytic findings of Babchishin et al. (2015). This is nonetheless consistent with Seto et al.'s (2006) claims that involvement with CEM is likely to be diagnostically indicative of paedophilic interests, and suggests that when considered in combination, antisociality is likely to be more important in distinguishing between CEM and dual offenders than among deviant sexual interests.

4.1 | Defining features: antisocial orientation and sexual deviance

The pattern of similarities and differences observed across offender groups support Babchishin et al.'s (2015) findings that the groups are primarily differentiated by antisocial traits and sexual interest in children. CEM offenders demonstrate high rates of sexual deviance but low rates of antisociality, contact offenders show the opposite pattern, and dual offenders exhibit the concerning combination of both high sexual deviance and antisociality. Given that these factors have been identified as two of the strongest predictors of sexual recidivism (Hanson & Morton-Bourgon, 2005), this suggests that dual offenders are likely to pose an increased risk and thus require the highest level of management and intervention of all three groups.

The findings of this study suggest that while low antisocial orientation is solely characteristic of exclusive CEM offenders, sexual deviance is likely to be a defining feature of the broader population of CEM users. Indeed, although many factors have been postulated to contribute to traditional contact sexual offences, few offenders would invest the time and effort in locating CEM online – let alone risk offending – if they were not sexually interested in the material, particularly given the vast and diverse array of other legal pornography available online. However, apart from a small number of untested motivational typologies and emerging pathway models (for a summary, see Henshaw et al., 2017), theories of CEM offending remain largely undeveloped to date, constituting a clear area for future development.

The findings further indicate that CEM offenders who present with characteristics that are more common among dual or contact offenders (e.g. lower education, offending histories characterized by both persistent sexual and violent offending, and high levels of sexual deviance) may pose an elevated risk of contact offending (Babchishin et al., 2015; Seto, 2013). However, as the predictive validity of these characteristics was not tested, one must not assume that a CEM offender is at risk of contact offending simply because of the presence of individual characteristics. Indeed, the multivariate model generated within this research performed best when all factors were included, suggesting that the context in which characteristics occur is important in differentiating between groups and, through extension, making inferences about the risks and needs of offenders. Thus, an obvious extension of these findings would be to examine the ability of these distinguishing characteristics to predict future sexual offending outcomes among CEM offenders specifically.

A clear question arising from this research is why dual offenders were the most difficult group to classify correctly within the final multivariate model. It is most likely the case that dual offenders are so similar to contact offenders in the characteristics evaluated that they may be best considered a subset of contact offenders who are driven by increased deviant sexual interests to use CEM to supplement offline offending (as described in Krone, 2004). Indeed, although several characteristics differentiated dual and contact offenders, the magnitude of the effects was small, suggesting that these differences may not be clinically meaningful. A second possibility relates to the likely heterogeneity of this group, given the multiple offending trajectories associated with becoming a dual offender (i.e. contact offending prior to, alongside or following CEM offending). Although not investigated to date, it is possible that offender characteristics differ across these various offending trajectories, thereby limiting the accuracy of efforts to classify these offenders as a single, homogenous group. A final possibility is that dual offenders are better characterized by factors that were not examined within this research, such as psychological or interpersonal characteristics, or characteristics unique to the online offending process itself. While existing research has identified some group differences in psychological and interpersonal characteristics (Armstrong & Mellor, 2016; Babchishin et al., 2015), there has been very little in-depth exploration of the online offence processes of either CEM or dual offenders to date. Thus, future research that examines both personal and offence process characteristics would improve current understanding of the characteristics, risks and treatment needs of both dual and CEM offender groups.

4.2 | Limitations

The findings of this study should be interpreted in light of a number of methodological limitations. First, the reliance on official offending records meant that undetected offences (both sexual and otherwise) were unable to be accounted for within this study. This may have compromised the classification of offenders and the characterization of offending backgrounds in some instances. However, as there is no reason to suspect that this issue affected the offender groups differently, the comparative findings are unlikely to have been significantly impacted by the reliance on official records. Second, there are limitations associated with the fact that the data utilized were pre-existing and not initially collected for the purposes of this research. This placed limits on both the amount and types of information available for examination in this context. It also limited the ability to reduce missing data, which was a substantial issue among the demographic variables and had a non-random effect across offender groups.

Finally, this research was narrow in scope, considering only three potential characteristic domains in differentiating between offender groups. It is possible that offenders would be further differentiated by the inclusion of psychological, personal background or offence-process characteristics that were not considered in this study. Moreover, some variables included in this research were indicators of underlying psychological constructs (e.g. antisocial orientation) rather than direct measures of the constructs themselves, limiting the ability to provide definitive inferences regarding underlying group differences. Given these limitations, future research that aims to extend the findings of this study by including more rigorous and complete datasets and a broader range of personal and offending characteristics (e.g. offence-supportive attitudes, interpersonal characteristics, and offence-process details) will probably be of benefit in teasing apart the differentiating characteristic CEM, dual and contact offenders.

4.3 | Implications

The findings indicate that Australian CEM offenders can be meaningfully differentiated from other child sexual offenders and thus can be likened to international samples of CEM offenders. Such evidence of differences between online child sexual offenders and traditional offline child sexual offenders raises concerns about the use of existing risk assessment tools and treatment programmes among CEM offenders. As existing assessment and treatment frameworks were designed for, and normed among, offline offenders, they may not effectively identify or meet the needs of this unique group of offenders. This would appear particularly relevant to those who engage exclusively in CEM offences, given that this group differed most substantially from the other groups, while dual and contact offenders were more alike.

Indeed, a small number of studies have shown that the Static-99 and Risk Matrix 2000 assessment tools overestimate risk among CEM offenders due to the inclusion of items reflecting victim characteristics that are redundant among CEM offenders (e.g. stranger and unrelated victim items; Osborn, Elliott, Middleton, & Beech, 2010; Wakeling, Howard, & Barnett, 2011). Moreover, although effective for predicting reoffending among dual offenders, a risk assessment tool that was recently developed for use specifically among CEM offenders (the Child Pornography Risk Assessment Tool; CPORT) failed to predict sexual recidivism among offenders who engaged exclusively in CEM offences (Seto & Eke, 2015). While the findings of both this study and existing research suggest that sexual deviance is likely to remain relevant to CEM offender risk, further research is clearly required to identify the unique factors underpinning development and maintenance of CEM offending specifically, and thus the likely risks posed by this group.

Regarding treatment, this research indicates that while the reduction and management of deviant sexual interests are likely to remain pertinent treatment targets for CEM offenders, interventions targeting broader antisocial attitudes and behaviours are less likely to be warranted. Thus, these findings provide support for previously expressed reservations about the suitability of treating CEM offenders within traditional programmes, and suggest that the needs of these offenders are likely to be better met by specialized programmes designed specifically for this group (Gillespie et al., 2018; Middleton, Mandeville-Norden, & Hayes, 2009; Seto, 2013). While a small number of such treatment programmes exist internationally (Beier et al., 2015; Gillespie et al., 2018; Middleton et al., 2009), data pertaining to their effect on offending outcomes is limited thus far, with further evaluative research required to ensure that any treatment gains demonstrated translate to a reduction in recidivism. Moreover, the findings of this research suggest that although content within existing treatment programmes is likely to be relevant to dual offenders, this group may also possess additional treatment needs that are specific to the online offending process. Thus, as further information regarding the unique risks associated with online offending emerges, existing treatment programmes may require modification to ensure that issues associated with online offending are also addressed.

5 | CONCLUSIONS

This research adds to the existing literature surrounding the comparative characteristics of CEM offenders by examining the demographic, mental health, and offending characteristics of a large sample of CEM, dual and contact sexual offenders in Victoria, Australia. Overall, the findings suggest that CEM offenders are a distinct type of child sexual offender, who differ from both dual and contact offenders on the basis of their lower antisocial orientation, and from contact offenders in terms of their higher levels of sexual deviance. The findings also support prior characterizations of dual offenders as possessing high levels of both antisociality and sexual deviance, indicating that this is likely to be an especially problematic group with a high level of treatment need. However, further research is required to investigate the unique characteristics and offence processes associated with the aetiology and maintenance of CEM offending to enhance understanding of the risks and needs of this offender population. Research such as this is crucial to the development of policy and practices specific to individuals who engage with CEM online and to the protection of the countless children harmed in the process.

Conflict of Interest

The authors declare that they have no conflict of interest.

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ENDNOTES

[1] A comprehensive list of the specific diagnoses and ICD-10 codes included in each category can be obtained from the corresponding author on request.

[2] Logistic regression was used in the absence of a non-parametric counterpart to analysis of covariance, given that data did not meet the assumptions of parametric testing.

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