

RESEARCH

Internet access and sexual offences against children: an analysis of crime bureau statistics from India

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Abstract

Introduction: The association between pornography and sexual crime is controversial, with various researchers finding positive, no, or negative associations. Recent evidence suggests that there may be a specific association between child pornography, which is easily available on the Internet, and sexual offences against children.

Methods: Using methodology similar to an earlier study from India, we obtained official statistics on sexual offences against children, namely rape and procurement of minor girls, for the period 2000-2012 from the National Crime Records Bureau. We analysed the association between the rates of these crimes and Internet access, measured by the number of users per 1,00,000 people.

Results: Even after correcting for population growth, we found significant linear associations between Internet availability and the rates of both these offences against children. However, there was no correlation between the growth rate of Internet access and the rate of increase of these crimes.

Discussion: While the association between pornography and the rape of adults is still under debate, our results provide indirect evidence of a possible association between Internet availability and sexual crimes against children. Regulation of the Internet to suppress access to child pornography may prevent at least some of these crimes.

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The association between pornography and sexual crime has long been a source of controversy. While some researchers have found a positive association between the two,[1] others have found a negative or even an inverse association.[2,3] In particular, naturalistic surveys conducted in developed countries have generally yielded negative results.[4,5]

A variety of explanations have been put forth to account for these inconsistencies. For example, declining rates of sexual crimes in these countries have been attributed to demographic shifts or changes in law enforcement policies rather than the availability of pornographic material.[6] Another influential model proposes that pornography does not have the same effects on all men: men with underlying psychopathology, such as paraphilias,[7] substance abuse,[8] or personality disorders,[8,9] may be more vulnerable to its "criminogenic" effects.[10] For example, a study of 200 young adult volunteers found that men who scored low on agreeableness - a personality variable which estimates one's ability to form positive relationships with others and

empathise with them - were more likely to develop attitudes supporting violence towards women when exposed to pornography.[11]

Apart from these social and psychological explanations, pornography itself is not a unitary construct; some forms of pornographic material portray sexual acts between consenting adults, while others depict acts that occur without consent, associated with violence, or having children as their object. These violent forms of pornography, which portray sexual assault and rape in an ambiguous or positive fashion - for example, by showing the victim as experiencing an orgasm or feeling no pain - have been linked to attitudes encouraging sexual violence against women,[12,13] including the acceptance of the "rape myth" in which rape is viewed as a pleasurable experience for both the offender and the victim.[13,14] But even in the case of such material, responses are not uniform: convicted rapists show greater physiological arousal than non-rapists when exposed to portrayals of rape involving humiliation.[15] Similarly, researchers have found a specific association between child

pornography and sexual offences against children,[16,17] and child sexual offenders often take pictures of their victims which may be disseminated and circulated as child pornography.[16] Exposure to child pornography may also influence the nature of the offences perpetrated: a study comparing different types of child sexual offenders (contact versus non-contact) found clear differences in the type of material preferred by each group.[18] Early exposure to child pornography may also increase the risk that an individual will perpetrate such offences: in one study, 65% of child sexual abusers had been exposed to such material before the age of ten.[19] However, even in this case, it has been argued that individual variables, such as a diagnosed paraphilia[3,7] or childhood abuse,[19] mediate the association between the use of child pornography and sexual crimes against children.

In the last two decades, the explosive growth of the Internet has seen a proportional increase in the availability of pornographic material, often at little or no cost, including child pornography.[20,21] Cooper *et al.*[22] have identified three factors that facilitate the use of child pornography over the Internet, which they term the “Triple-A Engine”: accessibility, affordability, and anonymity. Given the association between exposure to such material and offences against children described above, one would expect that increased Internet access might increase the number of such offences, but research has yielded variable results. A study of 231 Swiss men charged with the use of child pornography found that 4.5% were also guilty of sexual crimes against children,[21] while a retrospective study of 201 Canadian men identified as child pornography users found that 24% of them also had contact sexual offences against children.[23] As discussed above, other factors – such as antisocial personality traits[24] – probably interact with the consumption of pornography to determine which consumers will also act out on their impulses.

Research on the link between pornography and sexual crime in the Indian context is still in its infancy. As there are no accurate statistics on the use of such material by Indian Internet users, a recent study[25] used Internet access as a surrogate marker of access to pornography, and examined the relationship between the number of Internet users and the growth in rates of sexual crimes (rape and sexual harassment) against adult women. This study found no significant association between Internet access and these offences. However, these results are confounded by methodological limitations:

(1) The authors used the year 1991 as a “cut-off” to separate the pre- and post-Internet eras. The justification given for this date is that it marks the beginning of a period of economic liberalisation and growth in information technology. However, there was a significant lag time before this translated into substantial Internet

availability; the first available statistics on Internet access in India are for the year 1998, and indicate that only 0.1% of the population had such access.[26] Therefore, the pre- and post-1991 distinction may reflect the effect of other social and economic changes, rather than Internet access per se.

(2) In the correlation analysis, the raw total number of Internet users was used as a measure of Internet availability. While such figures are valuable, they must be corrected for total population size if they are to be meaningfully correlated with crime rates which have the total population as their denominator.

The authors of this study concluded that “the much-hyped causal relationship between pornography and sexual behavior is an exaggeration by politicians and mass media”. [25] This conclusion has far-reaching implications in terms of legislation and public policy, but it is not fully supported by the data presented in the paper. Moreover, this study failed to examine rates of sexual offences against children, which have shown a disturbing increase in recent times.[27] In order to address these deficiencies, we analysed the relationship between Internet availability and the rates of these crimes.

Methodology

We obtained statistics from the National Crime Records Bureau (NCRB)’s annual bulletins[27] on two distinct forms of sexual crime against children: (1) rape and (2) procurement of a minor girl for immoral purposes. We selected these two offences because (a) they were recorded in large enough numbers to permit meaningful statistical analysis, and (b) they have been linked by some researchers to Internet child pornography.[16,20] Separate data on these crimes was available from the NCRB from the year 2000 onwards. The total number of registered cases of these crimes was recorded, and their rates were calculated using the mid-year populations provided in the reports themselves.

As a measure of Internet use, we obtained statistics on Internet usage from the Internet World Stats website,[26] which records both the estimated total number of users in a given country, and the percentage of Internet penetration, calculated as the number of Internet users per 100 population. The figures available on this website were cross-checked with percentages calculated using the NCRB mid-year populations. There was excellent agreement between the two sets of values (mean penetration percentages 4.29 ± 3.6 for Internet data, 4.27 ± 3.6 for NCRB-corrected data; $p=0.99$ for difference between the two sets of values), and we used the latter as they were based on more accurate estimates of the mid-year population.

As both the child rape rates and the Internet penetration rates were normally distributed ($p>0.2$ for a non-normal

distribution, Lilliefors' test), we performed a Pearson correlation analysis between the individual crime rates and the percentages of Internet users. Since procurement rates were non-normally distributed, we used Spearman's correlation to examine their association with Internet access. Internet usage data for the years 2008 and 2011 was not available, so we performed two separate analyses: one without the missing data, and one using the previous years' percentages as a conservative estimate. Results of both these analyses are presented in this paper.

All statistical analyses were carried out using Statistical Package for the Social Sciences (SPSS), version 20. A value of $p < 0.05$ was considered significant for the purposes of this study.

Results

Rates of child rape per 1,00,000 population showed a steady linear increase over the period covered by the NCRB statistics, increasing from 0.31 in 2000 to 0.7 in the year 2012. There was significant evidence of a positive linear trend in this data ($p < 0.05$, runs test), with a median increase in child rape rates of 0.04 per 1,00,000 population per year. The most significant increase in rape rates occurred in the period 2005-2012, increasing from 0.37 to 0.7 ($p < 0.01$, change-point test). A similar pattern was obtained for rates of procurement of minors, which increased from 0.01 per 1,00,000 population in 2000 to 0.07 in 2012; again, the most significant increase in these rates occurred after 2005 ($p < 0.01$, change-point test).

Internet use in this period increased slowly from 0.5% (users per 100 population) in 2000 to 11.3% in 2012. Increase was gradual for the period 2000-2005 (0.5% to 3.6%) and was not statistically significant ($p > 0.2$, runs test); however, the period 2006-2012 showed significant growth, with the change occurring at 2006 ($p < 0.01$, change-point test). These rates are presented in Table.

Using Pearson's correlation analysis, we found a highly significant correlation between rates of child rape and the Internet penetration percentage (Pearson's $r = 0.92$, $p < 0.001$), with the association explaining 85% of the variance. This association remained significant when we made a conservative correction for missing data on Internet usage (Pearson's $r = 0.9$, $p < 0.001$).

Similar results were obtained for rates of the procurement of minor girls (Spearman's $\rho = 0.75$, $p < 0.007$), though they were slightly less significant, and this correlation also remained positive at a similar level (Spearman's $\rho = 0.78$, $p = 0.001$) when missing values were corrected for.

In our secondary analysis, we failed to find a significant association between growths in rates of either child rape (Spearman's $\rho = 0.38$, $p = 0.28$) or procurement of minor girls (Spearman's $\rho = -0.33$, $p = 0.35$) and the

growth rate in Internet penetration. Though there was a positive correlation between the rates of these two distinct crimes (Spearman's $\rho = 0.78$, $p = 0.004$), there was no association between their growth rates (Spearman's $\rho = 0.1$, $p = 0.79$).

Table. Rates of child rape, procurement of minors, and Internet access in India for the period 2000-2012

Year	Rate of reported child rapes*	Rate of reported procurement of minors*	Internet penetration percentage [#]
2000	0.31	0.01	0.5
2001	0.21	0.01	0.7
2002	0.24	0.01	1.6
2003	0.28	0.02	2.1
2004	0.33	0.02	3.6
2005	0.37	0.01	4.6
2006	0.42	0.02	3.6
2007	0.44	0.02	3.7
2008	0.47	0.02	NA
2009	0.46	0.02	6.9
2010	0.46	0.06	8.4
2011	0.59	0.06	NA
2012	0.7	0.07	11.3

*Per 1,00,000 population

[#]Calculated as (number of Internet users / Mid-year population) x 100

NA, missing data

Figures in bold indicate the point at which data show a significant upward trend as per the change-point test

Source: (1) National Crime Records Bureau, India, (2) Internet World Stats.

Discussion

Rates of sexual crimes against children in India have increased significantly over the last decade. Our results show that this increase is significantly correlated with an increase in the availability of Internet access. In addition, both the rates of these crimes and Internet availability showed a significant upward trend at around the same year – 2005 for sexual crimes, and 2006 for Internet access. These results suggest that there is both a temporal association and a positive correlation between a proxy measure of access to pornography - including child pornography - and two specific kinds of sexual offences against children. As this association was found consistently for both forms of crime - rape of children and procurement of minor girls - it is unlikely that this was due to chance.

A number of mechanisms may explain this association. First, child pornography may interact with individual psychological abnormalities, such as personality disorders or paraphilias, in a sort of stress-diathesis model. Such models, which posit both a pre-existing vulnerability and

an environmental exposure, have been used to explain a variety of mental and behavioural disorders. Data from the Indian setting suggests that a substantial number of violent offenders may suffer from mental illness, and that these offenders have psychological characteristics such as emotional instability and impulsivity which may lower their threshold for offending;[28] however, this study did not specifically examine sexual offenders.

Second, exposure to images that depict young children in sexual situations – known as sexualised images – is common on the Internet. Viewing such material may lower the inhibitions of consumers, and lead to an acceptance of child sexual abuse myths (similar to the “rape myth” described earlier) in which children are viewed as taking an active part in sexual situations and activities that are appropriate only for adults.[29] Exposure to such material at an early stage of the individual’s psychosexual development may increase the risk of perpetrating sexual offences in adult life.[19]

Third, the uniqueness of the Internet as a medium for the consumption of child pornography may cause both cultural and individual changes. At a cultural level, widespread access to pornographic material may lead to greater social acceptance, as has already happened in the West;[30] even in more traditional settings, changes in sexual practices and preferences related to pornography have been described.[31,32] At an individual level, the features specific to Internet pornography – the “triple-A engine”[22] – provides a “supra-normal” level of stimulation of brain reward pathways, leading to changes in neural plasticity and the development of an addictive pattern of usage. Whether such changes are linked to an elevated risk of committing sexual crimes is, however, still unclear.

Of course, it is possible that a positive correlation does not indicate a true causal relationship. A variety of other social factors, including changes in population distribution, value systems, family structure, and attitudes towards sexuality, can potentially contribute to the rising rates of sexual offences against children.[33] But even if this is true, we cannot rule out the individual and societal influence of the Internet on sexual behaviour, including deviant forms of sexuality. Other research methods, including anonymous surveys of Internet users and studies of sexual offenders in the criminal justice system, would be required to provide a definitive answer to this question.

Our study suffers from certain limitations. First and foremost, Internet use is only a proxy marker for easy access to child pornography, and its reliability is uncertain. Second, as statistics on sexual offences against children were available only from 2000-2012, the number of data points is small. Third, missing data on Internet access for certain years may have led to a mistaken

estimate of the strength of the associations found in this paper. Fourth, given the stigma associated with being a victim of sexual assault, and the “culture of silence” that often surrounds such offences,[33] child rapes may have been significantly under-reported.

Despite these limitations, our results provide indirect evidence of a possible association between Internet availability and sexual crimes against children. In the light of these findings, it may be premature to deny the possibility of an association between pornography and all forms of sexual violence, as earlier authors have done.[25] In such areas, where the opinions of health professionals may be used by policy-makers to frame laws for the protection of children, the principle of *primum non nocere* (first do no harm) is paramount. The psychiatric profession has an obligation to refrain from statements and theories that may be used to justify inaction in the face of rising rates of child rape. Until further evidence is available, regulation of the Internet to suppress access to child pornography should be seriously considered, as it may prevent at least some sexual offences against children.

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