



Youth, Pornography, and Addiction: A Critical Review

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Abstract

Purpose of Review In this article, we dig more deeply into the assumptions underpinning common-sense understandings about youth “exposure” to pornography and the ostensible “effects” of this exposure, specifically “pornography addiction”. We trace the emergence of the notion of “pornography addiction”, highlighting how cultural conditions have allowed for its realisation as a socially recognisable and intelligible narrative.

Recent Findings Media effects research on the issue of youth “exposure” to pornography is not conclusive, nor is pornography addiction officially recognised as a diagnosable disorder. Moreover, an emerging body of multidisciplinary qualitative research, which, importantly, includes the perspectives and experiences of young people themselves, raises questions about some of the assumptions and conclusions of effects-focused research.

Summary Despite inconclusive and contrasting findings, the social narrative of pornography addiction persists both within and beyond academe. We make sense of this persistence in relation to the broader problematisation of youth sexuality, which includes unease and moral objection to young people viewing pornography. It is important to recognise the broader socio-cultural systems supporting the cultural narrative of pornography addiction, and the social functions that this narrative serves, that is, the need for adult intervention into the sexual lives of youth.

Keywords Pornography addiction · Online pornography · Young people · Adolescence · Media effects

Introduction

Pornography has proliferated online, with digital devices offering historically unparalleled access to a wide range of people, including young people [1]. In this context, addiction to online pornography has been presented as a danger of the digital age and even a public health crisis [2•, 3•]. In under three decades, the identity of the “pornography addict” has become a familiar, largely taken-for-granted, spectre of the excesses of pornography consumption [3•, 4], widely accepted in the public imaginary [3•, 5, 6]. For example,

the extensively used website *WebMD* provides information on “pornography addiction” certified by a medical doctor. Subsequent to caveats about the inconclusive nature of pornography addiction, the *WebMD* reference details risk factors; causes; signs; complications, ranging from shame to job loss and substance abuse; and treatments, including therapy, medication, and addiction support services [6]. In the USA, 17 states have passed resolutions declaring pornography a public health crisis since 2016, citing its addictiveness among the concerns [7].

As these examples illustrate, the addiction narrative has—in a relatively short time—made its way beyond media reporting and into mainstream policy discussions in many western countries, already resulting in tangible actions to address the risk of addiction to online pornography [5]. These interventions frequently focus on young people, who are seen as uniquely susceptible to the danger of online pornography [8•, 9]. For example, in Aotearoa New Zealand, on the basis that “many young people suffer from exposure to pornography because it is an addictive force that is slowly consuming their productivity and capturing their creativity” [10], youth are offered counselling and support for

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pornography addiction through sexual harm services and youth-specific treatment through the national youth service.

The grounds for such intervention and the concerns driving them are questionable, given that research on the matter of pornography addiction is not conclusive, and the supposed affliction is not formally recognised as a diagnosable disorder by psychological bodies or public threat by public health authorities such as the World Health Organisation [2•, 3•, 11•, 12]. Yet, despite being a contested category in clinical, academic, and legislative fields, the relatively new notion of pornography addiction is well established as “an important part of almost any discussion about pornography” [3•]. Even in the absence of substantial evidence or scientific consensus, the concept of addiction continues to be a compelling and widely embraced narrative [13, 14].

How is it that the addiction narrative has taken hold so widely? Rather than debate the “reality” of pornography addiction (i.e. whether it objectively exists), we turn our attention to the work of scholars who consider how the pornography addiction narrative was established, how it persists and functions in the public sphere, and to what effect [4, 8•].

Establishing the Addiction Narrative Through an Exposure-Effects Explanatory Framework

The potential for excessive and uncontrollable consumption of sexually explicit material, conceptualised as pornography addiction, derives largely from contemporary mainstream psychology’s cognitively-based exposure-effects understanding of media consumption [15]. The stimulus-response model’s central premise is that exposure to “pornographic stimuli” influences viewers’ cognitions. From this perspective, media function in a causal way as “stimuli”, such that “exposure” to a “message” or “content” produces a “response” or an “effect” on viewers [16].

In this view, media effects are invariably assumed to be detrimental to viewers, especially young viewers. For example, in a recent review article about youth sexuality, the authors assert that it is both “public consensus and common sense” that pornography is “inherently negative and damaging” to young people [17]. This common-sense, harm-focused view owes much to the “dominant psychological paradigm that emphasises the significance of human behaviour, and intervenes at this individual level” [18]. In this vein, cognitively-oriented developmental psychology theories have been very influential, notably the social learning and social cognitive theories [19]. These theories are commonly drawn on in media effects research seeking to establish the extent to which media “exposure” influences young people’s behaviours through observational learning [20••]. Such work proposes, for instance, that “viewers’ own

sexual decisions can be shaped by observing, identifying with, and following the rewarded actions of media models” [21].

Though social-cognitive theory offers a more complex explanation of social learning than simple mimicry (as Bandura explains) [22], this perspective is often taken up and applied in this more simplistic way, especially as the notion of pornography addiction travels beyond scholarship into news reporting and public discussion. Consequently, young people are generally assumed to absorb and imitate media content, responding in a literalist way to what they see [23•, 24••, 25••]. This tendency is attributed to their developmental status as adolescents: that they are inherently unable to adequately engage with and respond to pornography and, in some renditions, biologically predisposed to addiction, as we explain more fully below.

Social cognitive theory has, however, been critiqued as a limited framework for exploring the issue of youth engagement with pornography. The social cognitive view of media as influencing viewers’ attitudes and behaviours in an uncomplicated, more-or-less linear way [18] has long been abandoned in media and communication studies as an oversimplified, reductionist understanding of how people engage with media. In this regard, several limitations of effects-based research have been highlighted, namely, its (i) almost exclusive focus on negative effects; (ii) reliance on simplistic assumptions about interactions between media use and behaviour; (iii) failure to explain why effects arise in some cases and not others; (iv) isolation of media use from other social factors, or accounts for them in overly simplistic ways; (v) insufficient consideration of how people relate media to other information sources; and (vi) tendency to oversimplify complex questions about the meanings and pleasures gained from media [16, 26].

Taken together, these critiques highlight the importance of acknowledging that pornography does not exist in a social vacuum and, as such, “unhealthy” sexual or relational practices (like sexism or sexual violence) cannot be *solely* attributed to its influence. The overly cognitive and individualistic media-effects approach overlooks that meanings are never singular and that viewers actively engage with media content, connecting it to other information sources. This approach also disregards the varied, complex ways that young people interact with media, including their varied visceral and affective responses to pornography alongside the larger social conditions shaping appetites and expectations vis-à-vis sex and intimate relations [27••].

Responding to these oversights, a growing body of multidisciplinary qualitative research from across the globe has sought to investigate the issue from a more comprehensive socio-political vantage point [25••, 28–30, 31••, 32••, 33, 34]. Importantly, much of this work has sought out the perspectives and experiences of young people themselves

[35–37, 38•]. Yet, despite critiques and emerging alternative evidence, the exposure-effects explanatory framework remains remarkably durable, supporting the persistent narrative of pornography addiction that is evident in public discussion ranging from news reporting to policy making. The prevalence of the notion of pornography addiction in western culture, as we discuss in the following section, can be attributed to its commonsense appeal [39] and, we would add, a lack of attention to how viewers themselves engage with and make meaning of pornography.

The Popularity and Persistence of the “Pornography Addiction” Narrative

Despite the lack of conclusive evidence about pornography addiction, criticisms of much of the underlying media effects scholarship, and emerging new evidence (discussed above) refuting some of its underlying premises, the notion of pornography addiction has had a profound impact on how youth engagement with Internet pornography is understood and approached. In this section, we highlight some significant cultural conditions supporting the emergence and persistence of pornography addiction as an intelligible and recognisable social narrative in contemporary western culture, particularly in relation to youth, viz., (a) the rise of the sex-tech nexus, (b) the tendency toward the medicalisation of social ills, and (c) the invention and naturalisation of adolescence.

The Rise of the Sex-Tech Nexus

The Internet has “transformed what is possible to represent about sex in popular culture and public space, and how these representations are created and disseminated” [40]. It not only allows for the proliferation of pornography, but it also offers easy access. It is precisely these characteristics that proponents of pornography addiction consider to be its catalyst and driver of the “problem”. For instance, the “triple A engine” theory proposes that “online pornography use is on the rise, with a potential for addiction considering the ‘triple A’ influence (accessibility, affordability, anonymity)” [41•]. The basis for addiction is therefore entwined with technology, increased Internet access, and digitalisation of modern life within a sex-tech nexus.

Of course, longstanding concerns about youth sexuality are heightened by the sex-tech nexus within which pornography exists. After the explosion of pornography online, concern about the potential dangers to individual viewers and wider society was significantly ratcheted up [4, 40]. These anxieties frequently centre on young viewers, deemed especially vulnerable to media “messaging”, particularly in relation to objectionable content such as violence and sex

[42]. For instance, scholarly attention has focused on digital media and the sexualisation of youth. These concerns about young people’s engagement with media representations are of course not entirely unfounded, but neither are they entirely new. The sex-tech nexus is part of wider public concern regarding rapid advances in technology and their potential negative effects [43].

As early as the 1950s, scholars raised concerns about “the seduction of the innocent” by new media, at that time comic books and television [3•, 8•, 44]. To the modern reader, these concerns seem somewhat naïve and obviously related to the moral panic over new media forms reflected in larger anxieties and debates of the time about changing social norms and values, most evident in youth culture. It is important not to lose sight of the fact that contemporary concerns regarding media exposure are part of this wider context of long-standing cultural anxieties about the potential negative effects of media and new technologies on consumers. This ongoing anxiety plays a key role in supporting and sustaining the pornography addiction narrative [3•, 8•, 45, 46•]. The proliferation and relatively easy access to online pornography grants a unique sense of magnitude and urgency to the issue, as evidenced in claims about Internet pornography as a public health crisis and scourge on young people’s sexual health and wellbeing [40, 47].

The Medicalisation of Social Ills

Pornography addiction as an intelligible category is realised within a contemporary cultural milieu that increasingly medicalises (troublesome) social issues [48, 49••]. Historically, medicalisation has been apparent when social practices and behaviours previously considered simply as “bad”, but at some point within the range of “normal”, were reframed as sickness [50]. Embodied social problems deemed morally problematic—like non-procreative sex or alcohol and drug use—are reframed in medico-scientific terms as alcoholism, drug addiction, and sexual disorder. Hence, as with other socially contested sexual practices like homosexuality and masturbation, pornography consumption follows the same pathway from sin to crime and finally to “disorder” [11, 51]. In this sense, the category of “addiction” is fundamentally grounded in negative judgements of pornography and notions of what sexual practices are socially un/acceptable [4, 48].

The medicalisation of young people’s engagement with pornography as addiction has been enabled by symbolically establishing the medium of pornography as an external influence, as evidenced in the common reference to youth “exposure” to pornography [47]. Indeed, the framing of pornography viewing as “exposure” is one commonly and almost exclusively applied to young people [52••]. As mentioned above, the exposure-effects model allows media products

to be envisaged as “not so much a cultural expression or a language, but a form of (damaging) social action” [18]. This allows pornography to be rendered as an external force that acts on the passive viewer’s brain, as shown for example in the following expert testimony given at the US Senate Commerce Committee’s 2004 hearing on the “Science of Pornography Addiction”.

“[Pornography] by its very nature, is an equal opportunity toxin. It damages the viewer, the performer, and the spouses and the children of the viewers, and the performers. It is toxic miseducation about sex and relationships. It is more toxic the more you consume, the “harder” the variety you consume, *and the younger and more vulnerable the consumer*. The damage is both in the area of beliefs and behaviors. The belief damage may include ... what constitutes a healthy sexual and emotional relationship. The behavioral damage includes psychologically unhealthy behaviors, socially inappropriate behaviors and illegal behaviors (8, emphasis added)”.

Here, pornography is described as a “toxin” but of course, unlike in cases of *substance* dependence, addiction does not reside in the physical properties of what is being consumed: (objectionable) images and ideas. Rather, what makes pornography toxic is its assumed negative effects (viz., individual and societal “damage”) alongside the in/ability to resist constant “exposure” caused by insufficient or declining social standards [11•, 13].

The addiction narrative vis-à-vis online pornography has been created and authorised by what has been described as a “melting pot of different emerging fields of knowledge” [4], which inform the medico-scientific framing of the issue. Chief among these is the discipline of psychology [19]. Alongside a mushrooming literature on media effects, mental health professional’s expert testimonies (largely drawing on earlier clinical studies of “sex addiction” among sex offenders) and/or observations about rising case numbers have helped authorise the existence of pornography addiction [1, 12]. Accounts of clinicians treating large numbers of self-described pornography addicts portray an easily identifiable set of clinical criteria, despite the extant literature on pornography addiction describing an inconsistent aetiology. Of course, some clinicians take a more nuanced, critical view, pointing to the wide range of ways that experts and lay people alike can make sense of the concept [14].

Nevertheless, the medicalisation of the issue of youth engagement with online pornography prevails. This reliance on psycho-medical expertise follows a fundamental shift in how youth sexuality more broadly is approached in contemporary western society. Recent decades have seen policy and practice largely moving away from moral framings toward risk-based understandings that rely on psycho-medical

expertise, shifting focus from moral danger to psychological risk [12, 45, 46•]. In this sense, the medicalisation of social issues such as young people’s engagement with pornography simply provides “a new diagnosis for old fears” [11•].

The Invention of Adolescence

At the heart of claims about young people’s susceptibility to pornography addiction is a particular twentieth century, western developmental model of adolescence as a troublesome transition period between childhood and adulthood. This now-dominant demarcation of the teenage years has replaced preceding “conceptions of youth as creative, powerful, co-producers of their social contexts” [53•] with a fundamentally deficit-based view of adolescence as a distinct and problematic developmental stage: a time of “storm and stress” [54] during which youth “as not-yet and less-than adults” [53•] are prone to rebellion and risk-taking [55–57]. This relatively recent theorisation of adolescence is so widely accepted that it is now viewed as ahistorical and natural, as Anderson-Nathe and Charles highlight:

“These developmental and psychological constructions of young people are now so widely taken for granted that in the academic and practice literatures, adolescence is the default starting point for most adult interactions with youth. ... These assumptions are accepted a priori, in spite of our own lived and practice experiences that may contradict them. These interpretations have even made their way into the hard sciences, with conventional wisdom now arguing they are biologically imperative given the deficiency of “the adolescent brain.” It can be argued that this research is bio-deterministic – most interpretations of brain research take adolescent theory as a starting point and seek validation through observation” [53•, pp. 222].

The taken-for-granted assumptions about “the adolescent brain” and the developmental basis for the propensity toward addiction, mentioned above, are clearly evident in research on pornography addiction. For example, the authors of a recent article titled “Internet Pornography exposure, influence and problematic viewing amongst emerging adults” make the claim: “Characterised by both exploration and engagement in risky behaviours, late adolescence and emerging adulthood are periods of particular vulnerability to dysregulated behaviours. One such behaviour less well explored is that of problematic Internet pornography viewing” [20••]. This paper reports on the findings of an Australian study measuring young people’s affective and cognitive responses to Internet pornography in order to predict future “problematic viewing” of Internet pornography, including self-perceived addiction.

The dominant conception of youth as simultaneously risk-prone and at risk highlights their assumed inherent naïveté and susceptibility to the dangers of online pornography. Accordingly, despite the lack of research on how well young people can actually “read” or make sense of pornography, it is commonly accepted that young people will inevitably lack the cognitive and/or emotional maturity to exercise self-restraint or to make sense of the representations they encounter in online pornography [30]. Moreover, these same assumptions establish the adolescent male as a particular object of concern vis-à-vis addiction to pornography.

Adolescence is infused with dominant gendered understandings, as shown in recent qualitative research on gender and engagement with pornography, which highlights common beliefs about masculine sexuality [58••]. For instance, that men are “biologically ‘hard-wired’ for pornography addiction” [9] or that adolescent males are “subject to powerful sexual urges fuelled by ‘raging hormones’ that they find difficult to control” [59]. Therefore, alongside the deficits associated with adolescence, the basis for young men’s pornography addiction is established upon assumptions about young men’s powerful sex drive alongside potentially limitless access to pornography (the triple A engine referred to earlier). It is then contended that these “addicted” young men spend vast amounts of time, and sometimes money, viewing pornography, fuelling related psychological problems such as depression and loneliness [15]. In contrast, young women may be cast as victims of pornography, at risk owing to their interactions with “porn addicted” men [58••].

The implication of these ways of understanding is that young people are rendered developmentally incapable of exercising restraint or engaging critically with pornography without adult intervention, in spite of the lack of evidence for these assertions. However, findings from research with youth in a range of contexts contradict the dominant deficit view of youth. These findings suggest that young people can be active and discerning social actors online [25••, 35, 38•, 60, 61••] and are more adept at negotiating online pornography than widely assumed [24••, 60]. Moreover, some young people are themselves critical of protectionist responses to their engagement with pornography [61••]. Based on these findings, Byron and colleagues propose a constructive, strengths-orientated focus in research and practice, maintaining that “adult researchers and educators can learn much from young people’s media expertise, including their existing literacies built around uses and understandings of porn and mediated sex” [24••]. Overall, the findings of this scholarship contradict the widely held belief that young people are hapless, helpless victims of online pornography, prone to addiction, and thus in need of adult intervention.

The Social Function of the Pornography Addiction Narrative

The pornography addiction narrative establishes a basis for adult intervention in ways that maintain control over youth sexuality specifically and the normative boundaries of sex and reproduction more broadly. It is this social function—of social control—that partly explains the durability of the pornography addiction narrative. Of course, adult intervention in the sexual and reproductive lives of youth is not without positive intention. Moreover, it is possible that an addiction narrative potentially avoids moralising and blaming young people for “degenerate” or objectionable behaviour. As we have seen in the past, concerns related to youth sexuality and reproduction were largely expressed as moral judgements, for instance, sanctions against “unwed mothers”, just as objections toward pornography have historically been cast largely in moral terms [6, 7, 10, 55]. However, critical scholars in youth studies and developmental psychology have highlighted how framing youth as vulnerable and at risk can be equally problematic, resulting in more insidious forms of social control over youth sexuality [62, 63, 64••].

The medicalisation of the “issue” of online pornography subjects young people to surveillance, expert intervention, and encouragements of self-regulation in order to restrict and control behaviours deemed socially unacceptable [65]. Critical research on youth sexuality has shown how presenting youth as an at-risk group particularly susceptible to sexual danger is implicated in the management and control of young people’s access to sexual knowledge. The establishment of categories, such as “porn addict”, imposes (disguised) moralistic regimens for protecting the “vulnerable” from danger [13]. Moreover, determinations and ideas about how to intervene are often based on adult fears about young people’s attainment of *unacceptable* sexual information [66••] and—owing to the foundational, deficit-based perspective of adolescence—most often take protectionist and adult-centric approaches. For example, the emphasis on young people’s vulnerability frequently results in authoritative and didactic, teacher-centred porn literacy education [61••]. Rather than achieving the stated aim of empowering youth and enhancing sexual agency, these interventions have the potential to heighten generational divides and youth/adult power imbalances, undermining young people’s agency, and promoting disengagement and resistance [23•, 61].

Importantly, the moral dimension of the addiction narrative remains obscured by the risk-based, medicalised framing of what is seen as morally offensive and unacceptable content [67••]. As we discussed above, concerns about the potential addictive nature of pornography are rooted in largely unsubstantiated claims about the individual and

social effects of objectionable content and resultant harm from “exposure” to it. It is viewing objectionable images and ideas contained in pornography that render it dangerous in these arguments. Such determinations are made explicit, for instance, by Wright (2014)—a proponent of social cognitive approaches—when discussing pornography as playing a harmful role in young people’s sexual socialisation. Wright argues that pornography “depicts positively many behaviours adults view negatively” and that “many adults would prefer if children did not model the behaviours depicted in pornography nor acquire pornographic perspectives on sex and social life” (p. 306). Among these behaviours, he names sexism, violence, and unprotected sex, along with casual sex, group sex, and sex with strangers, thus presenting a range of practices that are clearly associated with differing values and moralities.

However, the psycho-medical framework of addiction masks the fact that, unlike a biomedical condition, what is deemed risky in relation to sexual practices is not a neutral or value-free endeavour [68••]. Determining what counts as risk, and distinguishing certain risks from others, requires a process of interpretation or selection, informed by culturally defined moral issues, notions of ideal development and citizenship, power relations, and, unavoidably, what is in the best interests of the state [49••, 65]. Put another way, risks are “always political in their construction, use and effects, and inevitably include moral judgements” [69], despite being concealed by ostensibly objective and neutral scientific, psycho-medical, or public health framing.

Addiction, in particular, can be understood as inherently moral: as a disease of overconsumption. Designations of addiction involve demarcating pathology from normality based on what is considered good, normal, or healthy practice versus that which is deemed bad, excessive, or pathological [4, 46•, 49••]. Determinations of (sex) addiction are intrinsically linked to negative evaluations of the practice, often on the basis of (hetero) normative, middle-class ideals [4, 24••, 70•]. When it comes to the highly controversial issue of pornography, as we have argued elsewhere, “it is naïve to presume and disingenuous to claim that issues related to sexuality are not charged with moral, religious, symbolic, ideological, and political significance” [23•]. The psycho-medical framework of addiction, and ensuing medicalisation, merely “casts a gloss of neutrality over moral judgments about what is un/acceptable sexual practice” [23•], by referring to practices that are really delineated as morally unacceptable as risky, dangerous, or unhealthy.

Importantly, framing the issue in expert and scientific terms establishes the notion of at-risk youth as an objective,

“value-free” fact that is difficult to contest, especially for those cast as risky and unreliable within this framework: young people themselves [71]. Certainly, the dominant deficit view of youth given by developmental psychology theories means that young people’s own thoughts and experiences related to matters affecting them, especially sexuality, are rarely sought or given serious attention. Consequently, the responses that are developed from research remain adult-centric—focused on telling young people what (not) to do, while continuing to stifle and silence their voices—and thus largely unengaging and ineffective [64••, 72]. This is certainly the case with research, policy, and practice regarding engagement with pornography, which has largely been about youth, but without the youth voice [52, 73••].

Conclusion

Our review underscores the importance of considering the broader socio-cultural context and systems supporting the entrenched social narrative of pornography addiction [74]. A range of social factors shape how youth negotiate pornography and the sex-tech nexus more broadly, as highlighted in emerging scholarship cited in this review, which includes youth and uses qualitative methodology [15]. Qualitative methods allow researchers to unpack how pornography has become a new cultural reality for young people, one that may indeed be understood as “addictive”. We therefore advocate for further qualitative research with young people in a range of cultural contexts to provide nuanced and culturally specific insights into how they make meaning of their own experiences with pornography, including their perspectives on addiction to pornography.

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- emerging qualitative and critical scholarship that centres the youth voice. The authors advocate for a socio-historical approach to sexuality education, including pornography, and suggest an ethical sexual citizenship pedagogy as an alternative to porn literacy.**
24. ●● Byron P, McKee A, Watson A, Litsou K, Ingham R. Reading for realness: porn literacies, digital media, and young people. *Sex Cult.* 2021;25(3):786–805. <https://doi.org/10.1007/s12119-020-09794-6>. This study, conducted as part of a broader interdisciplinary project focusing on pornography's impact on healthy sexual development, showed that there is a limited number of articles discussing the connection between pornography use and literacy. These articles often characterise young people's porn literacy as their capacity to critically analyse pornography, often perceiving it as negative and featuring unrealistic depictions of sex.
 25. ●● Litsou K, Byron P, McKee A, Ingham R. Learning from pornography: results of a mixed methods systematic review. *Sex Educ.* 2021;21(2):236–52. <https://doi.org/10.1080/14681811.2020.1786362>. This article presents a mixed-methods systematic review of research regarding pornography's role in sexual education. It includes ten articles that discuss how porn users perceive the educational aspects of pornography. The review identifies five main themes related to “porn education,” which include learning about sexual mechanics, sexual identities, and sexualities. However, it also highlights shortcomings in information provided by pornography and the potential for misconceptions. The study suggests a need for more relevant sex education, particularly for young gay men, as pornography can offer valuable insights into the mechanics of sex.
 26. Buckingham D, Bragg S. Young people, sex and the media: the facts of life? Springer; 2003. <https://doi.org/10.1057/9780230508637>.
 27. ●● Meehan C. ‘I guess girls can be more emotional’: exploring the complexities of sexual consent with young people. *Sexualities.* 2022;25(5–6):821–41. <https://doi.org/10.1177/1363460721999275>. Utilising qualitative interviews within small friendship groups of young students in New Zealand, this article offers insights into their perceptions of consent in the context of producing and distributing intimate images. While acknowledging the value of digital literacy, the author underscores the importance of not neglecting discussions concerning gender, power dynamics, cultural influences, desire, victimization, or how young individuals from various socio-cultural backgrounds handle these aspects of relationships.
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