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Indian government initiatives on cyberbullying: A case study on cyberbullying in Indian higher education institutions

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Abstract
In the digitally empowered society, increased internet utilization leads to potential harm to the youth through cyberbullying on various social networking platforms. The cyberbullying stats keep on rising each year, leading to detrimental consequences. In response to this online threat, the Indian Government launched different helplines, especially for the children and women who need assistance, various complaint boxes, cyber cells, and made strict legal provisions to curb online offenses. This research evaluates the relevant initiatives. Additionally, a survey is conducted to get insights into cyberbullying in higher education institutions, discussing multiple factors responsible for youth and adolescents being cyberbullied and a few measures to combat it in universities/colleges.

Keywords Cyberbullying · Government initiatives · Higher education · Social media

1 Introduction

Cyberbullying is harassment done to the victim to cause harm via any electronic method, including social media resulting in defamation, public disclosure of private facts, and intentional emotional distress (Watts et al., 2017). It can be related to sending and posting cruel texts or images with the help of social media and other digital communication devices to harm a victim (Washington, 2015). It is a repeated behavior done by the individual with the help of social media, over the gaming, and messaging platforms that target mainly to lower the victims' self-esteem.

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In the past decade, Cyberbullying has been an emerging phenomenon that has a socio-psychological impact on adolescents. With the advancement of digital technology, youth is more attached to social media, resulting in cyberbullying. With the increasing usage of techno-savvy gadgets, social media applications are highly prevalent among the youth, which can be advantageous and disadvantageous. It allows sharing posts, photos, and messages personally and privately among friends, while on the other hand, it involves an increase in cyberbullying by creating fake accounts on the apps (Ansary, 2020).

In July 2021, 4,80 billion people worldwide were on social media, that's almost 61% of the world's total population depicting an annual growth of 5.7% as 7 lac new users join per day (Digital Around the World, 2021). As the number of users increases, there is a surge in cyberbullying; according to a UNICEF poll, more than 33% of youngsters are reported as victims of online bullying in 30 countries worldwide (UNICEF, 2020). Moreover, it is seen that one in five has skipped school due to fear of cyberbullying and violence. According to NCRB, 50,035 cases of cybercrime were reported in India in the year 2020, among which 1614 cases of cyberstalking, 762 cases of cyber blackmailing, 84 cases of defamation, 247 cases of fake profiles, and 838 cases of fake news were investigated. NCRB data[1] reported that cybercrimes in India increased by 63.48% (27248 cases to 44548 cases) from 2018 to 2019, which upsurged by 12.32% in 2020 (44548 cases to 50035cases).

Multiple cases of cyberbullying were reported across the country. As per news reports, in November 2016, a 23-year-old Ooshmal Ullas, MBBS student of KMCT Medical College in Mukkam, Kerala, committed suicide by jumping due to being cyberbullied over a Facebook post and injured her spine, legs, and head.[2] One more incident was reported on 9 January 2018 where a 20 years old Hindu woman killed herself after facing harassment on WhatsApp over her friendship with a Muslim man in Karnataka.[3] Another case was witnessed, a 15-year-old boy connected with the 'Bois locker room', an Instagram group where they share photos of minor girls and exchange lewd comments, was arrested by Delhi police on 4 May 2020.[4] An incident occurred on 26 June 2014 a 17 years old girl committed suicide after Satish and Deepak, her friends, morphed her photos and posted them on Facebook along with her cell phone number.[5] Many such cases are reported every year, and this rising number of suicides due to cyberbullying is alarming and worrisome.

The primary cause of cyberbullying is anonymity, in which a bully can easily target anyone over the internet by hiding their original identity. The

[1] https://ncrb.gov.in/en/Crime-in-India-2020

[2] https://www.india.com/news/india/mbbs-student-commits-suicide-in-kerala-facebook-post-hints-at-cyber-bullying-2639753/

[3] https://www.bbc.com/news/world-asia-india-42617237

[4] https://www.firstpost.com/india/delhi-police-arrests-instagram-group-admin-in-bois-locker-room-case-27-other-members-identified-8337451.html

[5] http://timesofindia.indiatimes.com/articleshow/37211521.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

psychological features play an eminent role in determining whether a person is a victim or a bully. A pure bully has a high level of aggression and needs succorance, whereas the pure victim has high levels of interception, empathy, and nurturance (Watts et al., 2017). It has been found that various factors are responsible for becoming a cyberbully. According to Tanrikulu (Tanrikulu & Erdur-Baker, 2021), Personality traits are responsible for cyberbullying behavior. The primary cause is online inhibition, in which a person bullies others with the motives of harm, domination, revenge, or entertainment. Other causes are *moral disengagement* as the findings imply that, regardless of the contemporaneous victimization status, moral disengagement has an equal impact on bullying perpetration for those who are most engaged. Pure bullies have more moral disengagement than those bullies/victims who aren't as active in bullying (Runions et al., 2019). The next one is *Narcissism*, which means individuals consider social status and authority dominant over their human relations. The last is aggression, which refers to overcoming negativities and failures by force, triggering them to do cyberbullying for satisfaction. Similarly, there are some personality traits associated with cyberbullying participants as a study (Ngo et al., 2021) examined three groups of online users where the first one is the "Intervene" group which believes in uplifting the morale of victims by responding to cyberbullying acts while others are the "Ignore" group that doesn't involve in reacting to the cyberbullying acts and just ignores the victims or leave the cyberspace and the third one is "Join in" that either promote the bullying or just enjoy watching cyberbullying act without any participation. The adolescents belonging to intervene group may play a critical role in reducing cyberbullying behavior and its consequences.

Social acceptance also plays a vital role in reducing bullying. It has been observed that among students who lack socialization activity, an individual contributes a high incidence rate of bullying that leads to victimization. Yubero carried out a study that depicts individuals feeling more comfortable in online environments that are not accepted by their peers and hence are more exposed to cyberbullying victimization. Apart from this, the relationship between loneliness and cyberbullying is more prevalent because lonely youth devote quality of time to the internet hence facing cyberbullying (Yubero et al., 2017). In this situation, students could either defend themselves or rely on cyber bystander intervention. A cyber bystander is one offering assistance to the victim, either individually or socially, and they are more inclined to act if they feel more empathy (Wang, 2021). Since interfering publicly may have detrimental consequences, cyber bystanders are more worried about being retaliated against or being the next victim.

Parental support and monitoring also help to escape cyberbullying victimization. It has been observed that parents who employed autonomy-supportive measures, such as understanding the adolescent's viewpoint, providing alternatives, and giving justifications for prohibitions, had youngsters who reported lower cyberbullying than parents who used dominating measures (especially using guilt, shame, and conditional regard) (Legate et al., 2019).

Cyberbullying is one of the significant problems that need to be eradicated. Due to cyberbullying, youngsters face many issues related to their health like depression, low self-esteem, suicidal thoughts, and even it leads to low academic performance, etc. Several aspects are considered responsible for cyber victimization like social media, online hours, parental monitoring, awareness, social engagement, etc. The incidences of cyberbullying are elevating day by day even after the strict crime-fighting measures by state and central authorities. But the implementation of specific rules and regulations against cyberbullying crime may alter the future scenario. The Indian Government is quite aware of the issue of cyberbullying faced on social media, and the Government carries out many remedial interventions like women and child helpline numbers. Moreover, the Government provides legal implementations and acts that are trying to curb the issues of cyberbullying.

2 Aim and objective

This study aims to evaluate the initiatives taken by the Indian Government at the forefront of this noble battle to stop cyberbullying incidences and to find out various factors that make youth more vulnerable to cyberbullying. The following objectives were expected to be accomplished:

1. Enunciating the problem of Cyberbullying in higher education institutions.
2. Assessing the initiatives of the Indian Government, legal provisions for cyberbullying, and their amendments.
3. Evaluate the responses of higher education students to cyberbullying questionnaire.
4. To examine the factors responsible for cyber victimization and a few measures to combat cyberbullying.

This study is divided into two modules, as shown in Figs. 1 and 2, to achieve the aforementioned objectives. The first module focuses on explaining and exploring cyberbullying on various online platforms via digital devices, as well as preventative actions done by our Government and different cyberbullying legislation in India. In the second module, we conducted an online survey to access and examine the responses of University/College students.

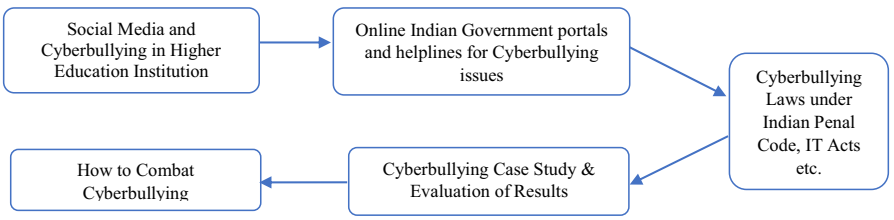


Fig. 1 Module 1- Outline of Research

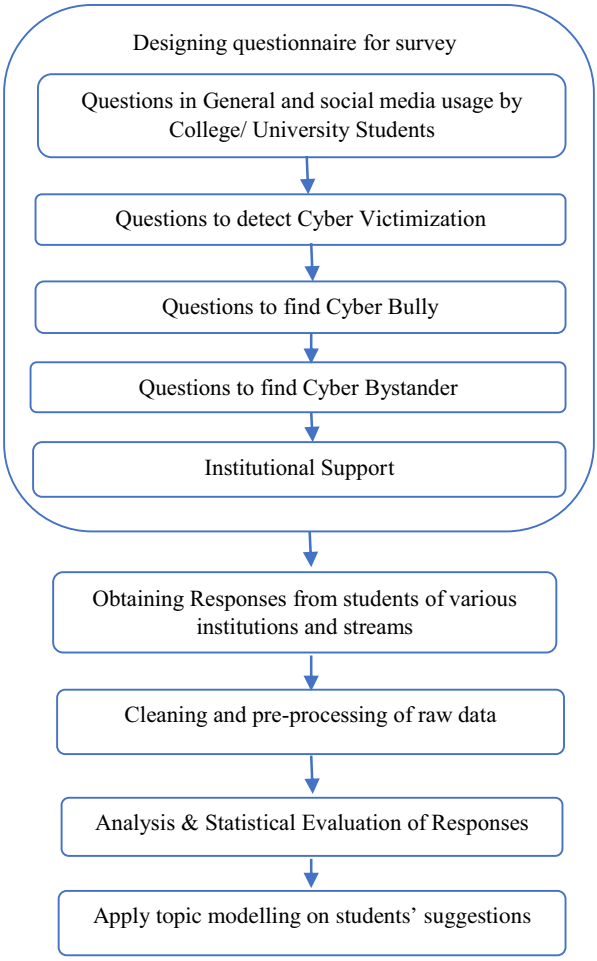


Fig. 2 Module 2-Case Study

3 Organization of paper

This paper is organized as follows, the Section 4 covers the review of research work on Cyberbullying in higher education institutions. The Section 5 highlights various merits and demerits associated with the internet, social media, and cyberbullying faced. Initiatives taken by the Indian Government in response to cyberbullying are elaborated in Section 6. The Section 7 provides insight into the survey conducted on students of higher educational institutions. It comprises data collection, data pre-processing, methods, and algorithms employed in conducting and evaluating the responses of the participants. A detailed analysis of the results is mentioned in the "Discussion" section. In the later part of the study, measures to combat cyberbullying, major conclusions, and future recommendations are specified.

4 Related work

In the context of cyberbullying, several studies have been conducted in various countries at college and school levels, examining the different parameters responsible for cyberbullying victimization and the laws against cyberbullying. Different countries have their legal provisions to tackle the situation. A study by (Çevik et al., 2021) has discussed factors contributing to cyberbullying and victimization, which are problematic internet usage, school burnout, and parental monitoring. As the long hours of internet usage have resulted in the establishment of fake friendships, low academic profile, aggression, low self-esteem, and loneliness. School burnout includes students lacking interest in studies, exhaustion over studies has resulted in high usage of internet sources, increasing the risk of peer bullying. Parental monitoring plays a crucial role in the lives of adolescents, but a lack of coordination is witnessed between the adolescent and parents, leading to cyberbullying and victimization.

Yubero (Yubero et al., 2017) surveyed a sample of 243 Spanish university students in the social science stream, and the results confirmed Only 9.8% of higher education students experienced cyberbullying on the campus, which is much lower than reported by other studies, it may be due to the time frame selection of case study or its definition. Various parameters that may be considered a prime cause of being a victim have been examined. As a result, not much correlation was found between the loneliness of a student and cyberbullying victimization; self-esteem and cyberbullying victimization. But a negative correlation was seen between perceived acceptance by peers and cyberbullying victimization. So, it concludes that emphasis must not only be laid upon preventive measures but also on educating or training peers to help each other and building good relationships with people from whom they can seek advice. Whereas, in Ghana, 878 students took part in this study, where 83% of students have experienced cyberbullying at least once, which is much higher than the previous study result. It seems that cyberbullying is acceptable everyday behavior among Ghanaian youth, even don't feel about reporting it, and not much difference between the personality traits of victims and non-victim seen (Sam et al., 2019).

Students can also use a few precautionary measures to reduce cyberbullying by changing their profile settings, as blocking and deleting are considered highly used protective decisions to prevent inappropriate actions over a social networking site like Facebook. Chapin (Chapin, 2016), has used the precaution adoption process model to promote precautionary behavior to lower the risk associated with the health due to cyberbullying. According to Chapin, it is seen that many students are aware of the act of bullying but don't take any action.

Cyberbullying has long-term effects, and bullying behavior may continue much longer than expected. In a study, 638 Israeli undergraduate students participated, and various cyberbullying problems were evaluated. The study demonstrated that students experiencing cyberbullying face academic problems, anxiety, career problems, depression, family problems, interpersonal problems, self-esteem, substance abuse, and suicidal ideation. 57.4% of participants

reported that cyberbullying among the youth will enter the workplace, which will continue throughout their lifetime (Peled, 2019).

In educational institutions, social networking platforms are beneficial, as Alamri et al. (Alamri et al., 2020) surveyed 192 students of King Faisal, a Saudi Arabian University. This survey was based on the use of SMA's (Social Media Applications) for education sustainability in the higher education system. In their research, they proposed a Theory acceptance Model used in conjunction with constructivism theory. In this model, they developed 14 hypotheses for the adoption of SMA's in students' learning systems and analyzed positive assessment of students for the adoption of SMA's in their higher education. Al-Rahmi et al. also discussed the use of Social media for Collaborative learning and information sharing among the students of the higher education system, in which a survey was conducted among the 538 university students. Students gave positive outcomes towards using SM (social media) for collaboration and student learning, highlighting the perceived enjoyment and ease. But at the same time, it has been observed that it may be affected due to cyberstalking, cyberbullying, and social media addiction (Al-Rahmi et al., 2020).

Ho et al. depicted the relationships between social support, cyberbullying victimization, and depressive symptoms and specialized their results, particularly studying the behavior of Vietnamese students (Ho et al., 2020). This research revealed that those students who are cyberbullied develop a higher risk of depressive symptoms. Still, social support, for instance, parental, peer, and special person support, can be considered a significant factor that can protect learners from developing such symptoms of depression. Also, while analyzing the survey results on 606 Vietnamese University students, it was found that social support is negatively correlated with cyberbullying, and social support is the only factor that helped those students come out from depression caused by cyberbullying.

Based on a cohort study performed in Hue city, 648 students were called from different schools. Only 9% of students were reported to be cyberbullied, while 17.6% suffered school bullying (Nguyen et al., 2020). Parental support has shown a protective relationship promoting the well-being among youth, more understanding and accepting attitude of parents is associated with reducing the consequences of cyberbullying that are mental issues, self-harm, and suicidal behaviors, including suicidal ideation, suicidal planning, and suicidal attempts in adolescents.

To assess risk factors and their impact in Myanmar, Khine et al. (Khine et al., 2020) conducted a cross-sectional study at a Medical university in Myanmar. The survey included 412 students in it, and the survey was based on factors leading to cyberbullying victimization during the last 12 months. The results were analyzed based on multiple logistic regression analyses. During the research, it was found that non-resident students or students studying at university for less than three years had a greater risk of being cyberbullying victims. The work also discussed the antagonistic relation between cyberbullying and academic performance and the positive relationship between cyberbullying and substance abuse, such as smoking and drinking alcohol. The research aimed that counseling services, cyber safety educational programs, and awareness of cyberbullying are urgently needed for university students of Myanmar.

Discussing another social networking platform, Aizenkot and Kashy-Rosenbaum have done a crossectional study to detect cyberbullying victimization in WhatsApp classmate groups in which 4477 students participated to complete the questionnaire. Here they (Aizenkot & Kashy-Rosenbaum, 2020) concluded that 56.5% of the students reported being victimized at least once, and 30% experienced it more than twice, while 18% (approx.) were victimized due to verbal violence. Other forms of victimization observed were offensive responses, insults, group violence, selectivity, particularly forced removal, and denied entry to WhatsApp groups. It leads our attention toward social media applications that distress the students.

Even During the covid 19 pandemic, when people were very much relied on online platforms due to social distancing and strict quarantine, they were suffering from depression and behavioral and mental problems. At the same time, especially the residents of Hubei, China, were facing all these problems and excessive cyberbullying, agitation, stigma, and racism peaked due to the first case of covid being reported in the city. This online bullying has severe psychological effects, and people were opting for various coping strategies. So here, the efforts must be taken unitedly by the worldwide online media, the health care workers, and the Government to prevent the secondary disaster of the pandemic in which cyberbullying was one of the major issues of concern for China (Yang, 2021).

5 Social media and cyberbullying in higher education institutions

Web 2.0 has initiated social media users, especially youngsters, to inculcate their viewpoints and express their thought processes in a virtual environment. Social media is a crucial platform that has encouraged students to expand interaction and has leveled up their performance. Despite its indispensable assets, liabilities cannot be overlooked in any condition (Sarwar et al., 2019). Cyberbullying has expanded with the higher usage of techno-savvy gadgets. The present times have modified common bullying into the involvement of harm, cruel thinking, and blackmailing through networking sites to the victims, especially on college campuses resulting in an increasing number of dropouts and suicides (Washington, 2015).

Higher command of mobile phones by adolescents has resulted in easy access to social networking sites without any fear. It has been increasingly contributing to cyberbullying, which has long-term adverse effects. Very few believe that it has a positivity that students become tough and develop a tendency of resilience and self-advocacy. Furthermore, it has been visualized that students do not know whether their institutions have a cyberbullying policy, and most institutions are not even prepared for handling such situations (Luker & Curchack, 2017).

Nowadays as the graduates are highly active over the internet for knowledge sharing, collaborative learning, and research activities which is beneficial yet resulted in the high indulgence of youth in cyberbullying, leading to negative impacts like aggressiveness, depression, low self-esteem, and also suicidal thoughts (Rasheed et al., 2020). Although there have been a myriad number of profits availed by everyone in the status quo, many people still undergo the undesirable effects that may alter one's privacy, security, and emotional health status.

From bygone days, it has been witnessed that Cyberbullying is an urgent issue on the social platform that can turn out either short-range, long-range, temporary, or permanent effects on one's life (Abaido, 2020). According to Yoshida (Yoshida, 2021), different kinds of online behaviors are shown by university students on social media platforms like Facebook, Twitter, and Instagram. They form different communities based on their knowledge or depending upon fan following while swinging their interest from one topic to another. They share their viewpoints on these online platforms where different audiences are reading them. Also, they lack sociability skills and have less knowledge about these online communities. Consequently, this incapability may lead to cyber victimization.

Even the young social media users of color have faced a lot of racial discrimination over the online platforms leading to mental health risks resulting in depressive symptoms, anxiety, and illicit drug use (Tao & Fisher, 2022).

Online gaming among young adults is prevailing at a high level with time as a good source of entertainment, but it's being observed to be one of the leading causes of bullying. Hence, online games have resulted in more aggression, violence, conflicts, emotional distress, mental torture, and physical arousals where family and community can act as an inevitable source to reduce the addiction to the internet and strengthen their mental health (Huang et al., 2021).

Moreover, students being cyberbullied do not share such incidences with their parents because they fear losing internet access. So, parents could not be assumed as their support system. The other approach is complaining, where a shocking dimension has been observed: there are no policies or federal laws dealing with cyberbullying directly; a federal system covers only a few aspects of cyberbullying (Washington, 2015). Another study has also concluded that victims are unable to express any kind of violent cybercrime behavior faced them, presuming that it can result in limited access to internet sources and gadgets by their parents. The victims also perceive that adults cannot understand the issues faced by them. Hence, this depicts a huge gap between teachers, parents, and adolescents (Ngo, et al., 2021).

Due to Cyberbullying on-campus, students are experiencing various adverse effects, including feelings of sadness, embarrassment, humiliation, desire for vengeance, and physical and mental retaliation (Cassidy et al., 2017). Despite strict rules and awareness, students do not come forward to report cyberbullying. They are afraid, feel self-ashamed, cry, become depressed, suffer from anxiety, experience insomnia, or even miss school (Watts et al., 2017).

Cyberbullying is considered one of the potential risks of relying on online technologies and has been one of the significant technology abuse examples in the past decade due to its harmful and sometimes deadly impacts. Counseling acts as a tonic and curative approach that may aid the cyberbullying sufferers in overcoming their fears and issues faced by them. Initiating a hotline or a mobile application can also turn into a valuable perspective. To foster counseling, short seminars and discussion sessions must be taken out regularly among the scholars. Bystanders should also take some initiative to eradicate online bullying situations by breaking their silence at the very right time (Abaido, 2020).

6 Indian government initiatives and legal provisions

Various laws of the Indian Penal Code (IPC) 1860 and the Information Technology Act, 2000 (IT Act) listed under legal provisions can be used to fight cyberbullies. A National Cybercrime reporting portal has been established for complaints, and a few more government initiatives are discussed.

6.1 Legal provisions

6.1.1 IT ACT, 2000

IT ACT, 2000[6] came into power to provide legal identification regarding the exchange of data electronically. In computer-related offenses, up to 3 to 5 years imprisonment and rupees one lac fine or both can be charged and, in some cases, even more. Under IT Act, *sections 66 A, 66 C, 66 D,* and *66 E,* punishment is given to the person involved in any crime of insulting or fraud or privacy violation, etc., utilizing the internet, social media, and other digital media devices. *IT act, section 67, 67A,* and *section 67 B* deal with publishing and transmitting material containing the sexually explicit act, etc., in electronic form. All these sections of IT Acts are explained in Table 8 of the Appendix.

6.1.2 The Indian penal code 1860

The Indian Penal Code (IPC)[7] is the official criminal code of India that covers all substantive aspects of criminal law, which came into existence in the year 1862 in all British Presidencies. *IPC Sections 292A, 354 A, 354 D, 499, 507, and 509* punish people who indulge in blackmailing, harassment, stalking, threatening, intruding, etc. (for details of IPC laws refer to Table 8 of Appendix).

6.1.3 POCSO ACT, 2012

Protection of children from sexual offenses (POCSO) is a complete law for protecting children below 18 years from the heinous acts of sexual assault, sexual harassment, and pornography.

6.2 Government initiatives

6.2.1 The Nirbhaya funds scheme

It is an initiative of the Government of India under the Nirbhaya funds scheme for ensuring the safety of women and children. The ministry of Home affairs generated a single number (112)[8] which was under the Emergency response support system

[6] https://legislative.gov.in/actsofparliamentfromtheyear/information-technology-act-2000
[7] https://legislative.gov.in/sites/default/files/A1860-45.pdf
[8] https://112.gov.in/

(ERSS), to cope with any emergencies where immediate assistance from police, fire, and rescue, or any other help is required. https://112.gov.in/

6.2.2 Cybercrime prevention against women and children scheme (CCPWC Scheme)

Under the CCPWA scheme,[9] for cybercrime prevention and setting up of Cyber forensic training labs grant of INR 87.12 Crore was released to states/UTs. Moreover, INR 6 crores were given to enhance police and prosecutors' training sessions. Under the CCPWA scheme, different units are established that are responsible for reporting online criminal acts and their investigations, analyzing cybercrime reports, and detecting any alarming cybercrime situation. Various components of the CCPWA scheme are given in Table 9 of the Appendix.

6.2.3 Indian cybercrime coordination centre (I4C) scheme

To prevent unnecessary use of social space, I4C acts as an essential tool to fight against cybercrime. Moreover, it is supported by fast pace technological advancements and international agencies to work on several activities. Its objective is to deal with different issues faced on online media, giving special attention to women and children victims and creating awareness among youth. Various components of the I4C scheme are mentioned in Table 10 of the Appendix.

6.3 Cybercrime reporting portals & helplines

6.3.1 National cyber crime reporting portal

NCCR portal is an initiative of the Government of India that submits online complaints by the victims who have faced criticism, especially women and children.[10] They provide immediate action on the filed complaints with the help of local police. Since the technology has been overstepping every conventional method, it has also outrun the offline process of filing cybercrime complaints. The cybercrime complaints can be registered on the National Cyber Crime Reporting Portal, which facilitates the nationwide cybercrime complaints and makes it feasible for the victims/complainants to have access to the cybercrime cells and all the information related to cybercrimes at their fingertips. The written complaint can also be filed by registering the crime-faced victim at a nearby cyber crime cell. Cyber Crime Portal State-wise, Nodal cyber cell officers and grievance officers' contact details and e-mail IDs are provided on the website https://cybercrime.gov.in/.[11]

6.3.2 Portal for women and children

Various helpline numbers and complaint portals for women and children are listed in Table 1.

[9] https://www.mha.gov.in/division_of_mha/cyber-and-information-security-cis-division/Details-about-CCPWC-CybercrimePrevention-against-Women-and-Children-Scheme

[10] https://cybercrime.gov.in/Webform/crmcondi.aspx.

[11] https://cybercrime.gov.in/

Table 1 Helpline portals and their description

Portal	Description
National women helpline number 118 and e-mail	The national women helpline number is 181. Moreover, a dedicated e-mail address Complaint-mwcd@gov.in has been created for women and children to file complaints related to abusive behavior, harassment, and hateful content on social media[a]
Childline 1098	CHILDLINE INDIA FOUNDATION (CIF)[b] is the nodal agency of the Union Ministry of Women and Child Development, which has generated *childline 1098* services that provide free 24/7 assistance to emergency needs regarding issues dealing with child rights and child protection all over the country. The alternative e-mail for complaints is dial1098@childlineindia.org.in
National Commission for Women Helpline: 7827170170	Under National Commission for Women Act, 1990 National Commission for Women was set up to review women's Constitutional and Legal safeguards and recommend remedial legislative measures, and a helpline was launched to provide Digital Complaint Registration System for women.[c] It also facilitates redressal of any kind of grievances and advises the Government on all policy matters affecting women
MahilaBol helpline[d] *number: 01244007444*	In December 2017, MahilaBol started in India in partnership with the Government of India and the United Nations to end the menace of sexual harassment of women in the workplace

[a] https://wcd.nic.in/

[b] https://www.childlineindia.org/

[c] https://www.ncwwomenhelpline.in/

[d] http://mahilabol.org/women-helpline/

6.4 Anti-bullying or cyberbullying laws in India for schools and colleges

With the high increase in bullying in schools, especially in boarding schools in India, the HRD ministry has launched anti-ragging committees to reduce the rate of bullying. These committees work on punishing students who are indulged in the activities along with rustication in case of high involvement in bullying. The University Grants Commission comes forward with anti-ragging rules in universities and colleges with proper UGC regulations on pulling out the rate of ragging in higher institutions.[12]

6.5 Other portals & awareness campaigns

The Ministry of Home Affairs has launched a centralized online cybercrime registration portal that has helped victims to register a complaint online rather than visiting the police station. Along with that Delhi and Indore police has a cyber cell to make people aware regarding filing a complaint online by the following link:

http://www.cybercelldelhi.in/
http://www.indorepolice.org/cyber-crime.php
https://ifflab.org/how-to-file-a-cyber-crime-complaint-in-india/

[12] https://www.google.com/amp/s/www.myadvo.in/blog/must-read-what-is-cyber-bullying-or-anti-bullying-laws-in-india/amp/

Chief Minister Sarbananda Sonowal launched the cyber safety awareness campaign in Assam on the occasion of the foundation day of the Assam police, which joined with cyber security and formed a Cyber Peace Foundation (CPF).

Awareness Campaign on Cyber Security By DSEJ[13] Jammu has made an awareness campaign for up to 2 Lakh stakeholders of the School Education Department on cyber hygiene and security held on 15 January 2021 along with online as well as offline counseling sessions on a large scale covering cyber grooming, cyberbullying, phishing, safeguarding social media accounts, online banking frauds, lottery frauds, remote access scams, social media privacy policy, etc. Many such awareness campaigns are organized nationwide by the respective Governments.

7 A Case study based on a survey

In this section, to investigate the problem of Cyberbullying in higher educational institutions, a survey has been conducted among university/college-going students that provide clear insights into the data analysis and case study outcomes.

7.1 Data analysis methodology

It includes the manual about designing the questionnaire for the survey, the process of collecting data, pre-processing data, techniques used to conduct the survey, and finally, applying algorithms to the collected data for evaluating the outcomes.

7.1.1 Designing the questionnaire

An online survey was conducted to gain insights into the feedback given by students on the cyberbullying faced by students of higher education institutions in India. The survey contains a questionnaire designed to collect information on the cyberbullying experience, various issues faced by students related to cyberbullying, the dependence of cyberbullying victimization on other parameters, institutional support, and feedback from respondents to stop cyberbullying. According to Lesley Andres, while preparing for analysis, we should identify the research problem questions and locate ourselves in the research design and process for designing an effective survey questionnaire (Andres, 2012). The quality of data analysis through survey questions depends on various factors like topics covered in the questionnaire, wording, format, and organization (Singh et al., 2021), (Williams, 2003).

In this study, a total of 72 questions were classified into five sections: the first is about general information and computer knowledge, the second one is related to cyberbullying victimization, the third is for cyberbullying and cyberbystander, fourth discusses the actions and effects of cyberbullying victimization, and the last one is about institutional support and suggestion. A google

[13] https://indiaeducationdiary.in/mega-awareness-campaign-on-cyber-security-by-dsej-concludes/

form was prepared, and the specific link was shared over the e-mails, and social media platforms like WhatsApp, Telegram, etc. The database was collected over three weeks, and due to the length of the questionnaire, 220 responses were received. 80% of respondents belong to the age group of 17 to 24. The general information about the participants, moreover their devices in use, and social networking sites being used most frequently are listed in Table 2. 60% of our

Table 2 Descriptive statistics of collected data

Respondent category	Number of responses
Total number of responses	220
Number of male respondents	105 (47.72%)
Number of female respondents	115 (52.27%)
Age:	
17–20	61 (27.72%)
21–24	115 (52.27%)
25–28	33 (15%)
29–32	11 (5%)
Number of Universities	12
Number of colleges	20
Number of study streams	More than 16
The student is a:	
Day scholars	88 (40%)
Hostellers	132 (60%)
Based on qualification:	
Undergraduate	146 (66.36%)
Post Graduate	58 (26.36%)
Doctoral	16 (7.27%)
Place of residence:	
Urban	111 (50.5%)
Rural	61 (27.7%)
Semi-Urban	48 (21.8%)
Devices (mobile/ smart-phone/ laptop/ desktop/ ipad)	
No device or 1 device without internet	7 (3.18%)
1 device with internet	133 (60.45%)
2 devices with internet	54 (24.54%)
3 or more devices with internet	26 (11.81%)
Social networking sites (respondents may be using more than one social networking platform):	
Instagram	150 (68.2%)
Facebook	111 (50.5%)
Snapchat	108 (49.1%)
Twitter	69 (37.4%)
WhatsApp	194 (88.2%)
Other	10 (4.7%)
How often do students witness cyberbullying on campus?	
Frequently	20 (9.1%)
Occasionally	28 (12.7%)
Rarely	81 (36.8%)
Not witnessed	91 (41.4%)

participants are hostellers, where most of the students are doing their bachelor's degrees. WhatsApp is the most popularly used application among the students, being used by 88% of users, and 60% (approx.) of users have observed cyberbullying at their campuses.

7.1.2 Data pre-processing

To remove the anomalies of the database collected in the survey few steps like data cleaning, filtration, removing duplicate responses, and the language translation are done (Maier et al., 2018). For statistically evaluating the responses, such as finding the correlation between various parameters, the Likert scale was used to convert responses to equivalent numerical values. Furthermore, the textual answers or the suggestions obtained from users are also pre-processed manually and with the help of algorithmic techniques of R package libraries for grammatical correction, removal of numbers, special characters, misleading information, and using google translator for conversion of regional language to English wherever required.

7.1.3 Outcomes of survey questions

i) In a survey question, it was asked to give their opinion on *which gender is bullied more*:

32.3% believe that females are bullied more than males, 10.5% believe that males are bullied more, 47.7% believe that both are bullied equally, and 9.5% prefer not to say. But the actual results of the survey go with the belief of the majority, where we find out that 54% of males are bullied, and approximately 51% of females are bullied. In fact not a significant difference between their bullying percentages.

ii) Definition of cyberbullying: An understanding by respondents

To have an idea, according to the respondents' about what cyberbullying is? According to the responses received, more than 50% of the respondents were clear about it, and the majority believe that threatening someone, taking or sharing someone's embarrassing photographs, and posting something hurtful on social media are major cyberbullying acts. Table 3 depicts the rest of the percentage of the views about Cyberbullying definition.

iii) Views on cyberbullying: *Is it a normal part of the online world, and nothing could be done to stop it:* Here, the views of male and female respondents do not deviate much. For both of them, it is unacceptable. 70% of the respondents disagree with the view that it is normal we can't stop it, and only 15% of the respondents take it as a normal activity, as shown in Fig. 3.

Table 3 Cyberbullying definition

Sending mean e-mails, texts, or instant messages	52.7%
Sending neutral messages to a person to the point of harassment	41.8%
Posting hurtful things about somebody on social media	59.1%
Spreading rumors or gossip about a person online	56.4%
Threatening or intimidating a person online or in a text message	63.6%
Taking an embarrassing photo or video and sharing without permission	62.3%
Making fun of a person in an online chat that includes multiple people	42.7%
Pretending to be someone else by creating a fake online profile	50.9%
Attacking or killing a character in an online game, constantly and on purpose	16.4%

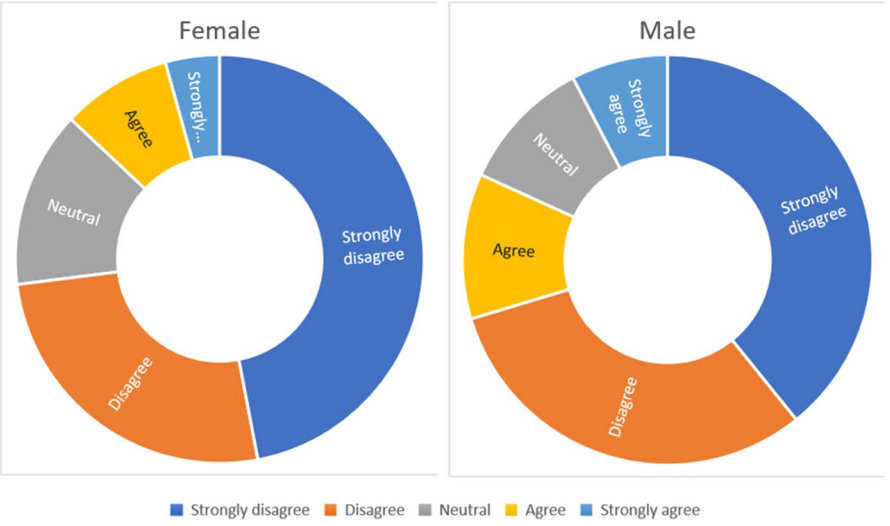


Fig. 3 Cyberbullying is a normal part of the online world

iv) Actual percentage facing bullying classified under different categories and factors:

In Table 4, the percentage distribution of bullied and non-bullied participants is mentioned depending on various factors like gender, social media usage hours, computer proficiency, area of residence, parent's talk, and their qualification. According to the number of hours of social media usage, on average, students use it for 4 h, and respondents using it for more than 4 h are bullied more than others. In addition, more than half of the participants have good computer knowledge, but not much dependency is seen between the computer proficiency

Table 4 Percentage distribution

	Total	Bullied	Not bullied
Gender			
Male	47.73%	26.36%	21.37%
Female	52.27%	26.82%	25.46%
Using social media (in hrs)			
0–2	16.37%	6.82%	9.55%
2–4	28.64%	10.91%	17.73%
4–6	34.10%	19.10%	15%
6–8	15.00%	11.36%	3.64%
8–10	2.73%	1.82%	0.91%
10 or more	3.18%	3.18%	0%
Computer Proficiency			
Excellent	27.73%	16.82%	10.91%
Good	52.28%	24.55%	27.73%
Average	16.37%	8.64%	7.73%
Below Average	3.18%	2.73%	0.45%
Poor	0.45%	0.45%	0%
Residence			
Urban	49.55%	27.73%	21.82%
Semi-Urban	21.82%	12.27%	9.55%
Rural	27.73%	12.73%	15%
Do your parents talk about online issues?			
Always	17.27%	6.82%	10.45%
Very frequently	11.36%	5.45%	5.91%
Occasionally	21.37%	11.82%	9.55%
Rarely	24.54%	12.27%	12.27%
Very rarely	15.46%	8.64%	6.82%
Never	9.55%	6.82%	2.73%
Parents Qualification			
Up to 10 + 2	46.82%	23.64%	23.18%
Diploma/Bachelors	28.63%	16.36%	12.27%
Masters/PhD	24.09%	12.73%	11.36%

and the percentage bullied by implementing the Chi-Square test using the Likert scale in Rstudio (Mircioiu & Atkinson, 2017). A p-value of 0.135 has been obtained, which is insignificant for showing a relation between computer proficiency and bullying percentage (Rana & Singhal, 2015). A weak relation is found between parents' talk and bullying; those whose parents frequently talk about cyberbullying are bullied a little bit less as compared to those whose parents never or very rarely talk about it. No correlation is found between the area of residence, and parental qualification of the students bullied.

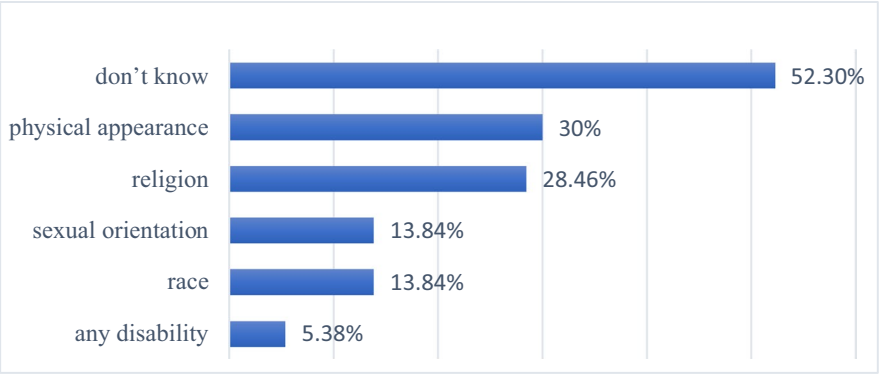


Fig. 4 Reasons for cyberbullying

v) When you were bullied, it was related to:

Of the respondents who have been cyberbullied due to multiple reasons, the majority of victims do not know the reason, and the most prevalent reason is their physical appearance and religion. Due to their sexual orientation and race, they have also faced bullying, and disability is also one of the reasons. The percentage of various reasons is given in Fig. 4.

vi) Questions related to CYBER VICTIMIZATION, CYBERBULLYING, and CYBER BYSTANDER:

Out of total female respondants, 51.30% of females faced bullying, 11.30% were unsure, and 37.39% were not bullied. In the case of males, 55.24% of males faced bullying, 14.24% were unsure, and 30.48% were not bullied at all. Among the persons with disabilities, 83% of males and 75% of females having any type of disability faced cyberbullying.

Out of the total bullies, 64.40% of bullies are male, and 35.60% of bullies are female. 18.26% of all the female participants accepted that they had bullied someone, and approximately twice the women's percentage, i.e., 36.19% of male participants have bullied someone. But in the case of the cyber bystanders, there is not much difference in their percentages. 44.34% of the female participants and 56.19% of male participants were cyber bystanders, respectively. Various questions and their response percentages related to cyber victimization, cyberbullying, and cyber bystanders are listed in Table 5.

vii) Actions are taken after being Cyberbullied & Effects on victims:

In the survey conducted, more than half of the students (51.8%) are not aware of cyberbullying laws, and 58.2% have no clue where to report or what action

Table 5 Questions on cyber victimization, cyberbullying, and cyber bystanders

Cyber victimization	Yes
Have you ever received an insulting or threatening or humiliating/embarrassing text message via email or mobile phone?	22.3%
Has anybody sent a message (via cell phone or internet) to others to insult you, speak badly about you, or say something that is not true about you?	44.1%
Has anyone uploaded your photos/videos on a social network profile or sent someone your photos/videos, without your permission to make fun of you/ harass you/ embarrass you?	14.5%
Have anyone used your device without your permission, to text or make calls to your friends pretending to you (with the wrong intention)?	14.1%
Have someone revealed your secret conversation or personal things on social networking sites (Facebook, Twitter, Instagram, WhatsApp, etc.) to embarrass you/ hurt you?	12.7%
Have someone criticized you or made fun of comments, photos, or videos you have uploaded to social networks (Facebook, Twitter, Instagram, etc.) or groups like WhatsApp?	21.8%
Has anyone tried to deliberately exclude you from an online group (chats, lists of friends, thematic forums, etc.) that make you feel bad?	21.8%
Has anyone hacked your account to send messages by e-mail or social networks (like Facebook, Instagram, etc.) that could be troublesome for you?	17.7%
Cyberbullying	
Have you sent someone threatening or insulting messages on a cell phone (WhatsApp, Instagram, Twitter, etc.)?	7.3%
Have you posted jokes, rumors, and gossiping on the internet to embarrass a classmate?	6.8%
To make fun of someone/ to embarrass or humiliate someone, have you made or manipulated videos or photos of him/her and uploaded or distributed them on social networks or by smartphone?	3.6%
Have you taken someone's smartphone and used it to send photos, videos, or mean messages to others to get him/her into trouble with them?	4.1%
Have you eliminated or blocked someone from groups (to hurt him/her or to leave him/her without any friends)?	18.2%
Have you logged into someone's account (e.g., e-mail, social network site) without her/his permission to get him/her in trouble?	7.3%
Cyber bystander	
Have you seen someone sending threatening or insulting messages on a cell phone (WhatsApp, Instagram, Twitter, etc.)?	20.5%
Have you seen someone posting jokes, rumors, and gossiping on the internet to embarrass a classmate?	32.7%
To make fun of someone/ to embarrass or to humiliate someone, have you seen anyone making or manipulating videos or photos of him/her and uploading or distributing them on social networks or by smartphone?	12.3%
Have you seen someone taking another's smartphone and using it to send photos, videos, or mean messages to others to get him/her into trouble with them?	16.4%
Have you seen someone eliminating or blocking someone deliberately from groups (to hurt him/her or to leave him/her without any friends)?	26.8%
Have you seen someone logging into another's personal account (e.g., e-mail, social network site) without her/his permission to get him/her in trouble?	22.3%

should be taken against the bully. It has been seen that among the cyber victims, 65.15% of students know the bully.

Various persons can experience cyberbullying, and according to the responses, among the students bullied, 40.20% of cyberbullying was done by their friends, 9.28% by their relatives or cousins, 31.95% was done by their peer group, 25.77% by any senior, 14.43% by a junior and 53.60% by unknown. As mentioned in Table 6, most cyberbullying victims feel comfortable discussing the matter with their friends or with nobody, only one-quarter of the percentage discuss it with their parents.

In Table 6, various questions related to cyberbullying victims, their reaction toward a bully, their parent's reaction, how the cyberbullying affected studies and work, and the victim's feelings are mentioned with percentages. Most of the victims felt angry and depressed, and around half of the victims asked the bully to stop this behavior.

As shown in Fig. 5, the R studio *corrplot* function is used to find correlations among various parameters, and it is observed that both the work and health of the cyberbullying victim are greatly affected.

In further detailed questioning, it is observed that 62% of cyberbullying victims ignore the messages of bullies so that he/they would lose interest,

Table 6 Actions taken in response to cyberbullying and its effects

After being bullied with whom they discussed the matter:	
Parents	27.35%
Friends	44.44%
Police	16.23%
Teacher	9.4%
Professional advisors	9.4%
Nobody	41.02%
Parents' Reaction When Students Were Cyberbullied:	
Report to police	42%
Not to involve the police	12%
Handle it on your own	33%
Blame you for all this	19%
Discuss with teacher	17%
Discuss with you how to manage your social networking accounts	18%
Ignore the matter	17%
Offer comfort and support	24%
Start monitoring your social networking accounts	16%
Victim reaction toward the bully:	
Ask to stop it	46.1%
Tell them this behavior is not acceptable at all	47.82%
Tell them you don't find it funny at all	17.39%
Ask why they did this?	33%
No action taken	17.39%

Table 6 (continued)

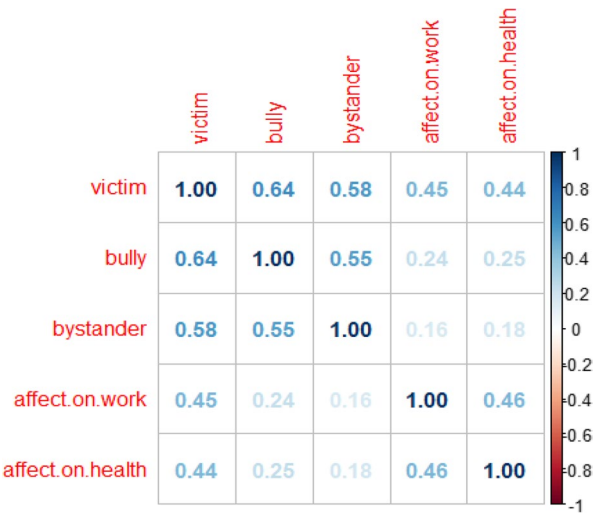
Have you gotten back to the bully?	
Virtually/online	14.02%
with friends in the real world	13.08%
Personally in the real world	8.41%
Not at all	64.48%
Affect on relationship with your friends/relatives	
Not at all	26.23%
Not very much	17.21%
Somewhat	22.95%
A lot	20.50%
Don't know	13.11%
Affect your work/studies	
Not at all	14.17%
Not very much	20.47%
Somewhat	30.70%
A lot	21.25%
Don't know	13.38%
Cyberbullying victims felt	
Angry	69.23%
Anxious	25.89%
Blamed yourself	25%
Depressed	42.85%
Helpless	25.89%
Lonely	25.89%
Don't know	26.78%
Desperate	13.39%

whereas 25% have sent threatening messages to bullies about doing such acts. Approximately 27% seek online advice on being bullied. Due to lack of awareness, only 40% of the victims save the cyberbullying messages or images as evidence. 32.4% of victims changed their contact details like phone number, e-mail address, chat name, or profile information visibility on social networking sites. 79% of the victims have blocked the bully so that he/she could not contact more.

viii) Institutional support

It has been observed that higher education institutions do not provide much support to the students and make them aware of this online behavior, as 68.2% of the colleges and universities are not taking any initiative to make students aware by conducting any awareness tutorial or campaign. Only 42.8% of

Fig. 5 Correlation graph



students who were bullied have taken guidance from university. Furthermore, 68.6% of the students have no idea where to report or to find the anti-bullying policy in their institution. Approximately 69.5% think their institutions are not doing enough to tackle the problem.

7.1.4 Topic modeling to extract relevant topics

For analysis of the feedback given by students to stop cyberbullying in institutions, using the R framework, LDA has been used. To extract the optimum number of topics in the feedback database, we used Griffith's 2004 (Griffiths & Steyvers, 2004) and Cau Juan's 2009 (Cao et al., 2009) metrics for our study in the R framework. Griffith represents an approach where the number of topics is optimal when the log-likelihood for data becomes maximum, whereas Cau Juan is used for measuring the stability of the topic and the minimum value on the graph represents the optimal number of topics. As from Fig. 6 number of topics lies between 4 to 9; in the upper graph minimum value is to be selected and from the lower one maximum value is to find the range of an optimal number of topics.

The latent Dirichlet allocation (LDA) is a statistical model that enables unidentified groups to explain why some sections of the data are related (Blei et al., 2003). If observations are words gathered into documents, it is assumed that each document is a mix of a small number of subjects and that each word's occurrence is due to one of the document's themes called topics. The time complexity of LDA is $O(mnt + t^3)$ and memory requirements of $O(mn + mt + nt)$,

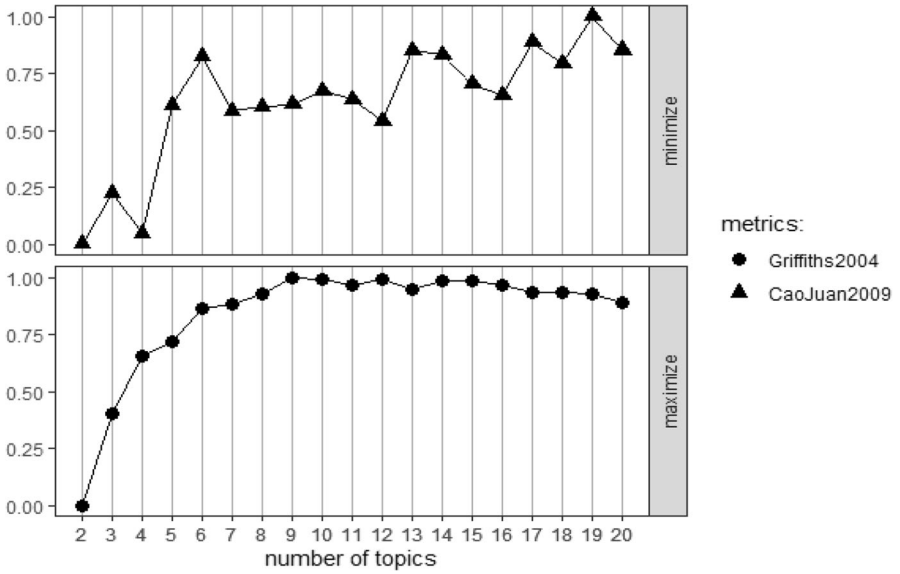


Fig. 6 Determining the optimal number of topics

where m is the number of samples, n is the number of features, and $t = min(m,n)$. It is impossible to use LDA when both m and n are big (Cai et al., 2008). The working of LDA is shown in the *Algorithm*. As there does not exist any prior information on the number of topics in our corpus, we used LDAvis, which generates interactive charts where each bubble represents the topic, and topic per word distribution is represented in the bar graph plot, selection of a bubble highlights the words and bars accordingly. The prevalence of topics depends upon the bubble size. For these graphs, the "optimum" value of λ was about 0.6, which resulted in a 70% likelihood of right identification (values of λ around 0 and 1 resulted in estimated proportions of correct replies closer to 53 and 63 percent, respectively). This is evidence that ordering words according to relevance (rather than strictly in decreasing order of probability) can increase subject interpretability (Sievert & Shirley, 2014).

LDA has extracted the discussion topics from the set of views database submitted by students to tackle this problem, explore all the main keywords, and highlight areas that need improvement. The findings indicate the formation of five clusters, the most frequent and interdependent keywords with other clusters or topics as depicted in Fig. 7. The number of clusters lies in the predicted range of optimal number of topics. From the topic modeling analysis, "Awareness" is the most frequent term and critical factor in curbing cyberbullying. The classification of most frequently used words and the keywords grouped according to LDA are given in Table 7.

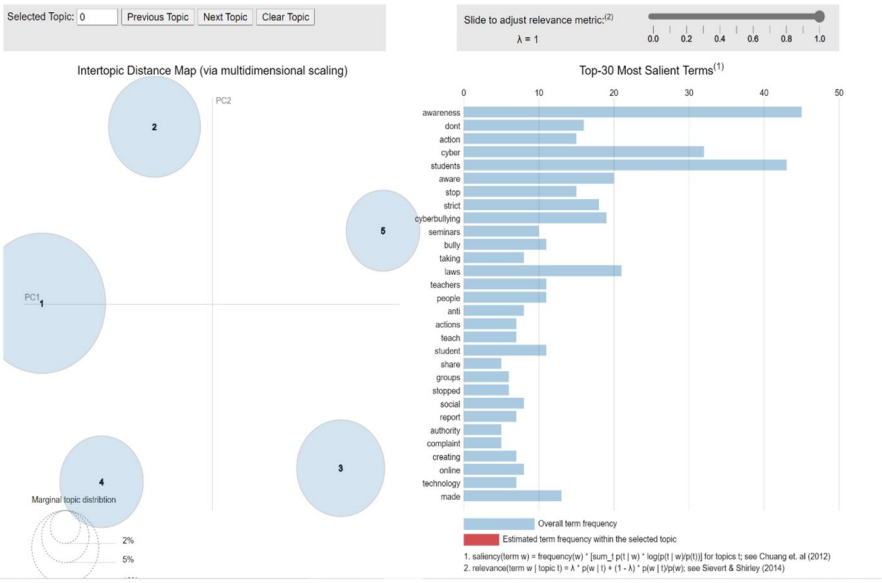


Fig. 7 LDAvis topic extraction graph

Table 7 List of topics covered in students' suggestions to stop cyberbullying in institutions

Topic 1	Topic 2	Topic 3	Topic 4	Topic 5
Students	Cyber	awareness	rules	don't
Aware	Students	seminars	strict	stop
Cyber	People	rules	authority	share
Laws	Cyberbullying	report	stop	groups
Bullying	Anti	strict	actions	stop
Students	Bullying	proper	complaints	teacher
make/made	Teacher	online	laws	report
Problems	Technology	cyberbullying	strong	cyberbullying
Stop	Counseling	spread	awareness	issue
Strict	Sessions	creating	stop	social
Situation	Issues	making	creating	strong
Tackle	Awareness	tackle	taking	person
People	Online	social	bully	bullying
Awareness	Action	groups		
Rules		making		
Technology				

```
Algorithm: Latent Dirichlet Algorithm
input: words w ∈ documents d
output: topic assignment z and counts t_{d,k}, t_{k,w}, and t_k
begin
    randomly initialize z and increment counters
    for each iteration do
        for i=0→n-1 do
            word ←w[i]
            topic ←z[i]
            t_{d,topic}-=1; t_{word,topic}-=1; t_{topic}-=1
            for k=0→k-1 do
                p(z=k|□)=( t_{d,k} +α_k) t_{k,w} +β_w (t_{k,w}+β)/(t_k+βw)
            end
            topic←sample from p(z|□)
            z[i]←topic
            t_{d,topic}+=1; t_{word,topic}+=1; t_{topic}+=1
        end
    end
    return z, t_{d,k}, t_{k,w}, and t_k
end
```

8 Discussion: Analysis of conducted survey

With the advancement of technology, social media has become a vital part of students' lives, either for their studies or entertainment. The major challenge is protecting the students from cyberbullying that can significantly affect their work and studies. Our focus is on examining cyberbullying among college/university students. For this, we divided our research into two modules. In the first one, we analyzed the Indian Government initiatives. While exploring legal provisions, it is found that so many laws, online portals and helplines are available. Strict laws implemented against cyberbullying are covered under IT Act 2000, IT Act Section 66A, IT Act Section 66 B, IT Act Section 66C, IT Act Section 66D, IT Act Section 66E, IT Act Sect. 67, IT Act Section 67A, IT Act Section 67B; under Indian Penal Code 1860, IPC Section 292 A, IPC Section 354A, IPC Section 354D, IPC Section 499, IPC Section 507, and POCSO Act 2012. Under various schemes like the Nirbhaya fund scheme, the Government launches a women and helpline number 112 for emergency response. Under CCPW Scheme, multiple labs and units have been established for cybercrime online reporting, the investigation by professional teams, and research and development. I4C scheme has also established many units for creating awareness, reporting, and inspection. MHA has established National Cybercrime reporting portals both online and offline. Moreover, the Ministry of Women and Child Development has generated a women's helpline number 118 and also a dedicated

e-mail address to redress their grievances. Separate Childline 1098, NCW helpline, Mahila bol helpline, and many state government portals are available. Various awareness campaigns are launched at the state as well as international levels. In second module, a case study was performed on cyberbullying in higher education institutions.

Section-wise analyses of the conducted survey

1. *General information:* 97% of the higher education institutional students (respondents) have electronic gadgets, except the few either do not have internet connectivity or a personal device. Even in the UNICEF case study, it was found that 99 percent of both urban and rural internet users aged 12 + years used mobile phones to access the internet.[14] WhatsApp and Instagram are the most widely used social networking sites that make them more vulnerable to experience cyberbullying. The responses of the participants depict that they are not much aware of the cyberbullying term, the legal provisions, and other governmental policies against cyberbullying. At the same time, it is observed that the majority of students reacted strongly to stop this behavior.
2. *Cyberbullying victimization and dependency of Cyberbullying on various demographic parameters:* According to the survey results, more than half of the respondents have experienced cyberbullying, which is similar to the percentage obtained in a study by Aizenkot and Kashy-Rosenbaum (Aizenkot & Kashy-Rosenbaum, 2020). It is concluded that males are cyberbullied more than females. Moreover, the person with a disability is the most affected as 80% of them face cyberbullying. Higher hours spent on social networking sites also lead to cyberbullying victimization. This case study found that Parental awareness and discussing online issues with youngsters have played a vital role in preventing them from being bullied, which resembles the conclusion of a study conducted in Vietnam by Ho et al. (Ho et al., 2020). The majority of the participants are not aware of the reason for being bullied but based on physical appearance and religion, cyberbullying is most prevalent among students. Approximately half of the participants have experienced cyber defaming.
3. *Cyberbullying and Cyber Bystander:* 18.26% of the female participants accepted that they had bullied someone, and 36% of males accepted it. The survey results depict that half of the participants are cyber bystanders. The most prevalent type of cyberbullying in this survey is leaving someone without friends by either blocking or eliminating them from social groups, and similar victimization was observed in a study by Aizenkot and Kashy-Rosenbaum (Aizenkot & Kashy-Rosenbaum, 2020). Cyber-by-standing is more common in male students, as one-third of the students have witnessed someone posting something wrong on social media to embarrass a classmate or use abusive language. Peer bullying is commonly seen among university students.

[14] https://www.unicef.org/rosa/media/16511/file/India%20Case%20Study.pdf

4. *Actions taken and the affect of cyberbullying on the victim:* Only 42% of the victims report to the police, and 36% of the students get back to the bully either personally or virtually. Cyberbullying has affected both the physical and mental health of the victim, and they experience aggressiveness and depression at most times. It also affects their relationship with friends and family and their work and studies. Also, the participants said that they have stopped using various social networking sites, restricted their privacy settings, and adopted other necessary measures to avoid bullying.
5. *Institutional support and suggestions*: Cyberbullying Awareness is the need of the hour, various institutions have cyberbullying policies, but the students are not aware of that. Students need guidance, and awareness sessions and campaigns should be organized at the college/ university level. As per students' suggestive measures, there should be proper counseling sessions, teacher support, guidance to tackle online issues, a complaint portal, strict laws, and concrete action against the bully. Institutions should also teach the ethics of social media usage.

9 How to combat cyberbullying

Cyberbullying can be significantly reduced with effective interpersonal communication among the peer group, and also bystanders can play a vital role in preventing cyberbullying if they intervene immediately on behalf of victims (Rafferty & Vander Ven, 2014). From the case study, it has been seen that the majority of students were cyber bystanders; they should come forward and encourage reporting such issues. The students are not much aware of the cyberbulling policies, so as suggested by Watts (Watts et al., 2017) anonymous reporting should be introduced, and internet etiquette should be studied.

It has been analyzed that colleges/universities are not doing enough to deal with this problem. In educational institutions, policy development is a pressing need that may be addressed using focus groups to identify effective remedies for cyberbullying. In addition, institutional leaders should consider a cyberbullying policy in terms of circumstances, and aside from that, leaders may improve their workers' knowledge abilities by conducting surveys and investigative sessions on cyberbullying (Luker & Curchack, 2017). The study depicted that approximately 70% of the respondents feel that institutions are not doing enough to curb cyberbullying so there is a need for university professionals to effectively analyze and mitigate unfavorable internet interactions on their campuses. All students and faculty members require assistance and counseling (Cassidy et al., 2017).

Creating awareness is the primary need as per students' feedback. The government has launched various portals, helplines for helping women and children, cyber cells, and reporting portals for online issues but students are not much aware of these initiatives and legal provisions. There is a need to raise

awareness. Insulting someone or defaming or making fun over social media are the most prevalent among educational institutions. The study findings by (Ngo et al., 2021) and (Hutson et al., 2018) have suggested several measures to curb cyberbullying. To begin, educational campaigns should be conducted to boost awareness and attitudes against cyberbullying across youth, parents, and teachers, inspiring them to become proactive in mediating and combating cyberbullying practices. Knowledge and practices on cyberbullying, communication and internet usage skills, education on digital citizenship, prosocial behaviors, empathy, and coping techniques with cyberbullying should all be included in these programs. From the case study it is observed that 70% victims feel angry, 43% depressed and one-third feel lonely and helpless. So, regular training sessions should be held to assist teenagers in developing the skills and talents necessary to actively cope with cyberbullying, assist other victims, and prevent them from being involved in cyberbullying themselves. Furthermore, institutions, healthcare providers, and leaders should promote parents' participation in suspecting and addressing cyberbullying and its implications among youngsters. This positive parent–child interaction may inspire them to seek help when confronted with adversity. In addition, Parents must exercise restraint and active mediation to raise awareness, as teenagers lack understanding of online threats and the ability to self-regulate their internet activities owing to a lack of experience (Steinfeld, 2021).

Also, the student Services at universities should design interventions where they concentrate not just on prophylactic work with techniques to eliminate cyberbullying but also on fostering relationships with individuals from whom victims may seek assistance with their online concerns (Yubero et al., 2017). Cyberbullying can be significantly reduced with effective interpersonal communication among the peer group, and also bystanders can play a vital role in preventing cyberbullying if they intervene immediately on behalf of victims (Rafferty & Vander Ven, 2014). As observed in cyber victimization questionnaire, cyberbullying faced by the majority is insulting someone, saying something untrue about a person or making fun of others over social media, or excluding others from online groups. Peer assistance initiatives appear to be successful in this regard where with proper training, students assist in educating their peers about using technology responsibly and cyberbullying by relating their experiences and strategies to avoid and address it.

A convenient, user-friendly, and cost-effective conversation bots (chatbots) can be used in anti-bullying programs to raise awareness regarding bullying and help change students' attitudes toward bullying problems (Oh et al., 2020). Moreover, to avoid consolidation and limit the impact on victims, all colleges should broaden their harassment policies, including cyberbullying; these protocols must include precise steps to be taken if such episodes are discovered. In the future, therapeutic assistance and victim protection should be included in protocols.

10 Conclusion and recommendation

With the technical advancement, and adoption of blended learning as a new paradigm in higher education, social media users are also increasing day by day, and the most significant impact is seen on the youngsters. Lack of knowledge about the ethics of using social media and the easy availability of the internet lead to cyberbullying. While the social networking sites act as a boon to the students, providing them an environment of collaborative learning even in the pandemics like covid19, at the same time, it may lead to cyberbullying victimization by exposing them to the hate and aggressive behavior on online platforms. Students have misused social media to humiliate or harass other students. So, regardless of the convenience offered by social media, the constant exposure to and communication with online technologies make the users susceptible to certain online interactions that may be beneficial at some point but put their safety and emotional and psychological well-being at risk. Over time, the Indian Government has launched various schemes (Nirbhaya Scheme, CCPW Scheme, I4C Scheme), online reporting portals (National cybercrime reporting portal), helpline numbers for women and children, and amended the required legal provisions of the IT Act and Indian Penal Code 1860 against the cyberbullying. State governments have also launched various awareness campaigns. As per UGC regulation, educational institutions have also stricken their anti-bullying policies. But the success of these initiatives depends upon the responses of the participants of the survey. It has been seen that the students are not much aware of all these laws against cyberbullying. More than half of the participants have faced cyberbullying, and many of them admitted that they had bullied others also. Cyberbullying victimization is dependent upon various factors like parents' guidance, the number of hours of social media usage, etc. Parental advice and lesser usage of social media may prevent the students from being bullied. Peer bullying is the most prevalent among college/university male students, and Cyberbullying has affected the students psychologically as well as physically; moreover, it degraded their performance at work/studies. Anger and depression are the major problems experienced by the victims. Two-thirds of the students are unaware of the cyberbullying policies and laws. After analyzing the results, it is suggested that the institutions and authorities organize seminars and counseling sessions to create awareness. They should follow strict measures to tackle cyberbullying, take appropriate actions, and establish complaint portals at the college/university level. The study covers a lot about the initiatives, provides insights into the current cyberbullying situation at higher education institutions in India, and concludes that more campaigns and seminars should be conducted to make students aware of all these legal provisions. At the same time, the study has a few limitations also: Firstly, based on popularity, only a few government initiatives and legal provisions have been listed, only national-level portals and helplines are mentioned, and State-wise programs and campaigns are not discussed. Secondly, the sample chosen may have many constraints due to the length of the survey; only limited responses are received, and the respondents may belong to the same environment and face similar problems. In the future, we will try to overcome these limitations.

Appendix

Table 8 Various sections under IT act and IPC

S.No	Laws	Description
1	*IT act, section 66 A*	This section is for punishing a person involved in derogatory, abusive, or harmful messages to cause annoyance, insult, injury, enmity, hatred, intimidation, inconvenience, or deception utilizing the internet or any other platform
2	*IT act, section 66 C*	This section includes the punishment for identity theft or impersonation and fraudulently using an electronic signature, password, or any unique identification feature of another person
3	*IT act, section 66 D*	This section deals with punishment related to the act of cheating by personation with the help of social media
4	*IT act, section 66 E*	This section penalizes for infringement of privacy or violation of someone's privacy digitally
5	*IT act, section 67 and 67A*	This is for punishment related to publishing or transmitting material containing the sexually explicit act, etc., in electronic form
6	*IT act, section 67 B*	This section deals with children's engagement in a sexually explicit act or conduct in electronic form
7	*IPC Section 292A*	This section includes punishing people indulged in the printing of grossly indecent or scurrilous matter or matter intended for blackmail
8	*IPC Section 354 A-*	This section covers punishment related to sexual harassment as unwanted physical contact or showing pornography
9	*IPC Section 354 D-*	This section covers stalking other person's contact by using any electronic gadget despite one's clear indication of disinterest
10	*IPC Section 499*	This section includes defamation performed to harm others by using online media
11	*IPC Section 507*	This section talks about punishing the offender involved in criminal threatening by anonymous communication
12	*IPC Section 509*	This section includes punishing people who insult women by using bad words, making any sound or threatening gestures, and intruding on their privacy

Table 9 Components of CCPWA scheme:

S.No	Components	Description
1	*Online Cybercrime reporting Unit*	The Online Cybercrime Reporting Portal upholds responsibility for easy reporting of any online criminal act and carrying out its further investigations
2	*Forensic Unit*	The forensic unit is made up of a professional team for the analysis of cybercrime reports and works 24/7. This setup is easily accessible to every center, state, and UTs
3	*Capacity Building Unit*	This is a unit that needs a specialty in investigations, detection, and forensics to curb criminals at the right time. To increase capacity-building training, various states have been provided with funding facilities
4	*Research And Development Unit*	The unit is taken steps to improve the technological innovations that can help in easy and early detection of alarming cybercrime situations where research can also be refined with developments by various institutions

Table 10 Components of the I4C Scheme:

S.No	Components	Description
1	*Cybercrime Threat Analytics Unit (TAU)*	TAU brings up a platform that investigates different issues one faces on online media with the help of law enforcement, experts, and regular discussion sessions
2	*National Cybercrime Reporting*	The primary attention in reporting is given to women and children who are victims of crime, which is fulfilled by timely reporting and lodging complaints
3	*Platform For Joint Cybercrime Investigation*	It targets threats faced during cybercrime with the help of preparing and starting multi-jurisdictional activities
4	*National Cybercrime Forensic Laboratory (NCFL) Eco-system*	This branch is related to the analysis of tests in forensic laboratories by fully equipped instruments and professional staff
5	*National Cybercrime Training Centre (NCTC)*	It focuses on establishing a positive environment for decreasing cyber-crimes and imparts a vast platform for open online courses to increase awareness among youth
6	*Cybercrime Ecosystem Management Unit*	The government initiative to expand awareness and to make norms to fight against crime
7	*National Cyber Crime Research and Innovation Centre*	This center has planned strategies to carry out investigations in private as well as intergovernmental organizations

Declarations

Research involving human participants and/or animals This article does not contain any studies with human participants or animals performed by any of the authors.

Conflict of interest The author declares that they have no conflict of interest.

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