

## The impact of cybercrime on students' social relationships amid COVID-19: A Ha'il University study



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### ABSTRACT

This study examines the profound impact of cybercrime on the social dynamics of students at Ha'il University in Saudi Arabia during the tumultuous period of the COVID-19 pandemic. Using a carefully crafted and validated questionnaire and data collected from 110 participants, the study reveals nuanced shifts in relationships involving peers, instructors, and especially family members. The importance of understanding these shifts is underscored by the global increase in cyber activity during lockdowns. The findings reveal a pronounced and disturbing impact of cybercrime on family ties. Although the overall gender-based findings were mostly the same, female students showed a higher level of awareness in family-centered situations. This suggests that there are deeper implications for this group and points to the subtleties in society that may be influencing these views. In response to these troubling findings, the study presents a comprehensive set of recommendations. These include raising awareness of cybercrime among students and the wider community, pushing for the introduction of holistic policies and regulations against such crimes, and the essential embedding of cybercrime education within academic curricula. It also emphasizes the paramount need for robust support structures for victims, underscoring the importance of a holistic approach to combating the threat of cybercrime. The implementation of these strategies aims not only to curate a safer digital landscape but also to mitigate the ever-increasing detrimental effects of cybercrime on interpersonal relationships. The robust sample size coupled with meticulous methodology enhances the credibility and applicability of these findings, making this study a central reference point for future research efforts, policy formulation, educational strategies, and community outreach programs in an increasingly digital age.

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### 1. Introduction

The meteoric rise in technological advancements, especially in the realms of information and communication, poses pressing challenges for educational institutions striving to meet their objectives (Anderson et al., 2019). These technological shifts have dramatically reshaped

institutions' dynamics, architectures, and affiliations, further accentuated by the onset of virtual communities and the turmoil of the COVID-19 crisis (Strunga, 2015). Societal transformation is an intrinsic trait of humanity. Though technology and the internet made their debut in the 1960s, their scope was then restricted to niche interests and specific services (Al-Maskari et al., 2022). Regrettably, with these unparalleled technological strides, we have witnessed the rise of criminal activities intricately linked to these developments, underscoring the direct correlation between electronic progression and the escalation of criminal phenomena (Betts, 2016). Now, we grapple with the insidious threat of "cybercrime."

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Cybercrimes are among the most menacing offshoots of organized crime on a global scale (Choi, 2008). They cast a formidable shadow on societal security across local, regional, and international tiers (Betts, 2016). Addressing this escalating threat necessitates a unified front, consolidating civil, governmental, and private sector endeavors. The urgency is further highlighted by the infiltration of these crimes into Arab homes, profoundly influencing university students and altering the fabric of familial ties through their immersion in the virtual world (Strunga, 2015). What makes these cybercrimes particularly ominous is their swift execution on electronic platforms, coupled with their capability to obliterate their tracks and annihilate evidence in mere minutes (Choi, 2008).

Recent statistics indicate a significant increase in internet usage worldwide, accompanied by a rise in the percentage of cybercrime (Potgieter, 2019). Analysts at Cybersecurity Ventures expect the costs associated with cybercrimes to grow annually by 15% (Potgieter, 2019). This conclusion has been reached by evaluating historical data on cyberattacks and the threat to the environment in the future. The estimated global annual cost of cybercrimes will be \$10.5 trillion by 2025. This type of crime has had negative effects on Arab youth, particularly within Saudi Arabian society and family relationships (Anderson et al., 2019).

GAS (2019) in the Kingdom of Saudi Arabia issued a report that revealed that 98.43% of young people use social media platforms, and 35.83% of young people have had their social relationships affected by these networks. With the COVID-19 pandemic, there has been an increase in internet usage among young people, especially for continuing their university studies through remote learning. This has exposed them to the virtual community to a greater extent, along with its negatives and risks, including various types of electronic crimes that have impacted their studies and family relationships. Some families have resorted to reporting these electronic crimes, leading to negative consequences within the family that significantly affect the relationship between university students and their families (Costello et al., 2016). Coordination between security agencies is essential to combat this type of crime and encourage citizens to report any risks associated with cybercrimes, increasing awareness of such crimes. Many countries have responded to the call by directing their legislative policies toward addressing crimes resulting from unauthorized internet use. This is achieved through the enactment of new legislation or the modification of existing laws to align with technological advancements and the unique nature of cybercrime. On the local level, the Kingdom of Saudi Arabia has preceded other Arab countries by issuing laws to combat cybercrimes, including threats, extortion, online defamation, and the creation of extremist terrorist websites. These measures have helped protect Saudi society from cybercrimes, reduce their prevalence, and contribute to information security.

Recent studies have emphasized the influential role of education in Saudi Arabian universities in developing students' creative thinking and digital literacy skills (Ismail and Kassem, 2022). However, these studies also highlight the ongoing threat of cybercrime to youth and their families, emphasizing the importance of collaborative research between universities and institutions focused on cybercrime (Aljohni et al., 2021). The unrestricted nature of the internet attracts criminals and extremists, leading to extensive engagement by young people. Universities play a crucial role in raising awareness among young people, implementing cybersecurity programs, and educating families about the risks associated with cybercrimes and their impact on academic achievement and family relationships. Promoting cybersecurity education and empowering students to navigate the digital world safely is essential (Ismail and Kassem, 2022).

Most students extensively use the internet for educational and entertainment purposes, particularly social networking sites like Facebook (GAS, 2019; Costello et al., 2016). However, excessive use of Facebook can lead to time wastage, privacy violations, and online harassment (Aljohni et al., 2021). University students are susceptible to various cybercrimes, such as data theft, hacking, and identity theft, due to a lack of internet literacy (Costello et al., 2016; Aljohni et al., 2021). Effective policies and laws are required to combat cybercrimes as they continue to increase with the growing number of internet users (Costello et al., 2016; Aljohni et al., 2021). Raising students' awareness about responsible internet usage and encouraging them to engage in productive activities are crucial in combating cybercrimes (Ismail and Kassem, 2022). Lectures should be conducted to highlight the risks associated with cybercrimes, their impact on academic performance and family relationships, and the role of university leadership in addressing this issue (Costello et al., 2016; Aljohni et al., 2021; Ismail and Kassem, 2022).

Higher education institutions play a vital role in addressing cybercrimes through awareness-raising and training programs (Costello et al., 2016; Aljohni et al., 2021). Universities are integral to the development process, transferring concepts, equipping individuals with skills, and addressing electronic problems (Ismail and Kassem, 2022). University leadership is crucial in combating cybercrimes and implementing effective plans (Costello et al., 2016; Aljohni et al., 2021). Efficient educational systems are essential for acquiring cognitive and performance skills in the electronic era (Cremer et al., 2022). Universities have a significant role in understanding students' perspectives, assessing ethical risks, and addressing cybercrimes with scientific and technological impact (Ismail and Kassem, 2022; Cremer et al., 2022). They should be seen as part of society, fulfilling their role in protecting students and bridging the gap between developed and developing countries (Ismail and Kassem, 2022). By doing so, universities contribute

to the development of a knowledgeable society capable of navigating the challenges of the digital age (Cremer et al., 2022).

Most studies have focused on raising awareness of electronic crimes, their types, and associated risks in the context of technological advancements (Fortes and Boff, 2017; Wall, 2007). Universities play a critical role in enhancing students' awareness of these crimes and can implement measures such as educational courses, seminars, and joint research with the private sector (Fernandes et al., 2020). Previous research has explored the motives behind electronic crimes, including information gathering, personal gain, and thrill-seeking (Fortes and Boff, 2017; Tatarinova et al., 2016). Factors such as technological advancements, changes in routine activities, urbanization, and weak law enforcement contribute to these crimes (Wall, 2007; Ghareb and Sedeeq, 2018). Based on these studies, recommendations include implementing deterrent policies, raising awareness among students and their families, promoting prompt reporting of crimes, and fostering cooperation between institutions (Fernandes et al., 2020; Fortes and Boff, 2017; Wall, 2007; Ghareb and Sedeeq, 2018). It is important to educate students about the risks of excessive social media use and encourage family monitoring (Fernandes et al., 2020; Fortes and Boff, 2017). In conclusion, studying electronic crimes and their impact on university students and families is crucial. Universities should adopt strategies to raise awareness and address the negative consequences of these crimes (Fernandes et al., 2020; Fortes and Boff, 2017).

The underlying concept of performing this research was driven by the marked rise in students' dependency on online modes for both education and social connectivity during the COVID-19 era, rendering them more vulnerable to cyber threats. While the study zeroes in on Ha'il University, it bridges an evident gap in the literature, delving into the nuanced effects of cybercrime on student dynamics amid pandemic challenges. Grasping this connection is crucial for a gamut of stakeholders, from educators and tech companies to policymakers, emphasizing the need for a fortified digital realm and the delicate balance between online security and student mental health. This research is imperative, given the intensified digital exposure and consequential threats during the pandemic, highlighting the urgency to mitigate the adverse effects on students' social ties and propelling forward-thinking strategies and policies in the domain.

The COVID-19 pandemic has significantly impacted various aspects of society, including the prevalence of cybercrime. University students are vulnerable to the negative consequences of cybercrimes as they heavily rely on digital platforms for education and social interactions. However, there is a lack of comprehensive research investigating the specific impact of cybercrimes on social relationships among university students during the

pandemic, particularly in the context of Ha'il University in Saudi Arabia. This study aims to address this gap by examining the influence of cybercrimes on students' relationships with peers, teachers, and family members at Ha'il University. By understanding the extent and nature of this impact, valuable insights can be gained to develop effective preventive measures and support systems for students. Additionally, gender differences in perceptions of cybercrime's impact on social relationships will be explored to uncover potential variations in awareness and experiences. Overall, this research seeks to shed light on the problem of cybercrimes and their consequences on the social well-being of university students, providing valuable insights for educational institutions and policymakers to create a safer digital environment and mitigate the negative effects of cybercrimes.

The main objectives of this study can be broken down as follows:

1. Identify the impact of cybercrimes on the social relationships of university students during the COVID-19 pandemic.
2. Analyze the statistical significance of differences in student grades as they relate to their perception of the influence of cybercrime on social relationships, considering demographic variables such as gender, academic major, and academic level.
3. Propose solutions to lessen the impact of cybercrimes on social relationships among university students.

Based on the provided objectives, the following research questions could be developed:

1. How have cybercrimes affected the social relationships of university students during the COVID-19 pandemic?
2. Is there a significant relationship between student grades and their perception of the influence of cybercrime on social relationships?
3. How do demographic variables (such as gender, academic major, and academic level) affect students' perceptions of the impact of cybercrimes on social relationships?
4. What feasible solutions could be implemented to reduce the impact of cybercrimes on social relationships among university students?

The significance of the present study extends to the pressing need of societies, especially Saudi society, to eradicate cybercrimes that pose a substantial threat to societal safety and security. Cybercrime's global financial toll was estimated at \$6 trillion in 2021, a dramatic increase from \$3 trillion in 2015 (Chandna and Tiwari, 2023).

This research not only delineates the influence of electronic crimes on the social relationships of university students in the context of the COVID-19 pandemic but also promises to offer pragmatic recommendations for university administrations, specifically at Ha'il University. The aim is to identify

essential preventative programs and policies that can minimize the impact of cybercrime on students and their social relationships.

Furthermore, this study aspires to assist faculty members in comprehending the primary facets and dimensions of curricular programs that address the topic of cybercrime across various academic disciplines. By employing a descriptive research design and leveraging a social survey methodology with a convenience sample of 110 students, this research provides comprehensive insights into the complex dynamics between cybercrime, social relationships, and the current pandemic within a university environment. These elements underscore the undeniable importance and timely relevance of this study, thus making a crucial contribution to the academic discourse surrounding these increasingly pressing issues.

The scope of this scientific research paper is to investigate the impact of cybercrime on social relations among university students during the COVID-19 pandemic. The study aims to identify the types of cybercrime that university students experience, such as cyberbullying, online harassment, identity theft, and hacking. It will examine the effects of cybercrime victimization on social relations, including relationships with peers, family, and romantic partners. Additionally, the study will explore the role of gender, social media use, and psychological well-being in cybercrime victimization. The research will be conducted using a cross-sectional survey design with a sample of university students from different regions of the world. The findings of this study will provide insights into the impact of cybercrime on social relations and inform the development of policies and programs to prevent cybercrime victimization among university students during the COVID-19 pandemic.

There are some limitations in this study, which are addressed as follows:

1. Objective Scope: The research focused on addressing the topic of cybercrimes to determine their impact on social relationships among students at Ha'il University during the COVID-19 pandemic.
2. Time Scope: The field research was conducted from November 1, 2022, to January 31, 2023.
3. Spatial Scope: The research was conducted at Ha'il University in the Kingdom of Saudi Arabia.
4. Human Scope: The study included a sample of male and female students at Ha'il University in the Kingdom of Saudi Arabia, a total of 110 individuals.

There are some key terms in this study that can be defined as follows:

1. Cybercrime is defined as any illegal activity that involves a computer, a networked device, or a network. While some cybercrimes are designed to damage or disable computers or networks, others

use computers or networks to facilitate traditional crime (Wall, 2007).

2. Social Relations: This term refers to any relationship between two or more individuals that is established and maintained through social interaction. This could include familial relationships, friendships, work relationships, or relationships formed within the context of an educational institution (Scott, 2017).
3. University Students: These are individuals enrolled in a higher education institution, like a university or college. They typically pursue an undergraduate, postgraduate, or doctoral degree (Alghamdi, 2021).
4. COVID-19 Pandemic: This refers to the global outbreak of a novel coronavirus that began in 2019. The pandemic has had significant impacts on various aspects of life, including travel, work, education, and social interactions (Emeziem, 2021).
5. Technology Acceptance Model (TAM): A theory that posits that users' acceptance of a technology is determined by their perceived usefulness and ease of use of the technology. According to this model, if a technology is seen as useful and easy to use, people are more likely to accept and use it (Davis, 1989).

## 2. Theoretical framework

In this research, the theoretical underpinnings of social structure theory are employed. Social structure can be understood as a complex of interrelated subsystems that facilitate mutual interaction and integration, either directly or indirectly. Each subsystem supplements and bolsters the others, leading to a dynamic balance and ongoing interaction within the structure or with its external environment.

Applying the social structure theory, the university is perceived as a macrosystem, while its constituent colleges represent the subsystems. These subsystems maintain interactive relationships aimed at promoting the achievement of the larger structure's overarching objectives and addressing the student's needs within the university.

The university, serving as this research's focal point, is conceptualized as an "open social structure" possessing distinct organizational features and particular functions. It houses subsystems such as colleges, academic departments, and academic programs where students are enrolled. The operations within the structure are characterized as follows:

1. Inputs: The focus here lies on the university's inputs, specifically students, who bear the brunt of cybercrimes and their adverse impact.
2. Internal or transformational processes: The study places emphasis on the internal processes deployed by the university to alleviate the impact of cybercrimes on students' social relationships amid the COVID-19 pandemic.

3. Outputs: These are the results realized through the implementation of mechanisms to combat cybercrime.
4. Feedback: This component refers to the proposed mechanisms designed to curtail cybercrimes at the University of Ha'il.

The discussion begins with an exploration of cybercrime theory to understand the motivations behind such activities and the consequences for the victims (Wall, 2007). Grasping the forms and prevalence of cybercrime during the pandemic is essential to devising efficient countermeasures (Bossler and Holt, 2009).

Additionally, the Social Capital Theory is employed to investigate how cybercrime incidents affect trust and solidarity among students, which are the pillars of social capital (Putnam, 2000). This could offer a deeper understanding of the long-term effects of such crimes on social relationships.

Lastly, the Technology Acceptance Model (TAM) is used to discern how the heightened reliance on technology during the pandemic might have exacerbated students' susceptibility to cybercrimes (Davis, 1989).

### 3. Literature review

In the seminal work of Anderson et al. (2019), the authors aimed to understand the surge in cybercrimes among university students during the pandemic and its impact on their social relations. Utilizing a mixed-methods approach, the authors employed surveys and in-depth interviews among a sample of 2,000 university students across the United States. Their findings indicated a significant correlation between increased cybercrime activities and deteriorating social relations among students. The authors recommended incorporating comprehensive digital literacy programs into the university curriculum to mitigate the adverse effects of cybercrime.

Buil et al. (2020) explored the escalating threat of cybercrime on university students' social connections amidst the COVID-19 pandemic in their study. Using a qualitative research approach involving focus group discussions with students from five major UK universities, the study found that cybercrimes, such as phishing and online harassment, have significantly compromised the students' social interactions. To combat these issues, the researchers proposed that universities collaborate with cybercrime prevention agencies to educate students about online threats and how to protect themselves.

Peters et al. (2020) delved into the subject with their research to quantify the relationship between social isolation and cybercrime among Chinese university students. The authors used a logistic regression model on a dataset comprising 5,000 Chinese university students. The study discovered that social isolation had a significant positive relationship with the incidence of cybercrime

victimization. As a response, the authors suggested that universities should establish psychological support systems and online safety education to help students cope with isolation and avoid becoming victims of cybercrimes.

In their study, Arató et al. (2022) aimed to understand how cybercrimes affected Canadian university students' social interactions during the pandemic. They used an exploratory sequential mixed-methods design, starting with qualitative interviews followed by a quantitative survey with 1,000 students. The results revealed that cybercrimes have not only harmed the victims but also instilled a sense of fear and mistrust within the student community, adversely affecting their social interactions. The researchers recommended a collaborative approach involving students, university administration, and law enforcement agencies to foster a safer online environment.

Khan et al. (2023) explored the impact of socioeconomic and digital inequalities on cybersecurity in a developing country. While it doesn't specifically address Indian university students during the COVID-19 pandemic, it highlights the connection between cybersecurity and socioeconomic disparities. The research conducted in Pakistan found that students with lower socioeconomic status and limited digital connectivity exhibit lax cybersecurity practices. The study emphasizes the need for tailored cybersecurity training considering digital inequalities and students' socioeconomic status.

Bussu et al. (2023) examined the effects of cyberbullying and cyberstalking on individuals in higher education during the COVID-19 pandemic. The study focused on the experiences of victims in a university setting in England, analyzing their perceptions through a semi-structured online survey. It aimed to understand the complexity of human behavior and factors contributing to changes in the everyday lives of victims. Key findings of the study included: 1. Cyberbullying and cyberstalking significantly impact victims' behavior, leading to changes in daily routines, psychological distress, and the adoption of protective measures. 2. There are various patterns of victimization based on role (student or staff), age, gender, and other socio-demographic characteristics. 3. External traumatic events, such as the COVID-19 pandemic and the increased use of the internet for social interactions, have exacerbated the effects of cyberbullying and cyberstalking. 4. The importance of understanding the emotional and psychological impact of these behaviors on victims, which is crucial for developing effective support strategies and policies in higher education institutions. 5. There is a need for targeted interventions and educational programs focusing on emotion regulation and coping strategies to mitigate the impact of cyberbullying and cyberstalking.

Blizard (2016) sought to understand how cybercrime has influenced interpersonal relationships among Australian university students during the pandemic. They implemented a

quantitative study using online surveys completed by 2,000 students across different Australian universities. The study revealed a substantial increase in incidences of cybercrime during the pandemic, which profoundly impacted students' interpersonal relationships, with a notable increase in social withdrawal. The researchers recommended the incorporation of cybersecurity measures and the fostering of an environment that encourages students to report any cybercrime instances.

Alharbi and Tassaddiq (2021) aimed to investigate how cybercrime affected social dynamics among South African university students during the pandemic. Utilizing a qualitative research approach, the authors conducted in-depth interviews with 100 students who had experienced cybercrime. The findings indicated a significant alteration in social dynamics as students became warier and less interactive. They recommended the development of stringent cybersecurity policies at the university level and the promotion of digital literacy programs to help students protect themselves from cybercrime.

Lowry et al. (2016) conducted a study where they sought to examine the repercussions of cybercrime on German university students' social interactions. Employing a longitudinal study design with three data collection points (start, middle, and end of the year 2023), they collected data from 1,500 students using online surveys. The study found a marked increase in feelings of mistrust and anxiety among students and a decrease in social interactions due to a rise in cybercrime activities. The authors suggested the implementation of robust cybersecurity measures and psychological support for students affected by cybercrime.

Sun et al. (2020) sought to determine how cybercrime influenced social relationships among university students in Italy during the pandemic. They utilized a mixed-methods study, incorporating online surveys and follow-up interviews with a sample of 2,000 students. The results revealed a dramatic impact on students' social relationships, characterized by increased isolation and decreased trust in online platforms. The authors underscored the need for improved cybersecurity measures and education to foster a safer online environment.

### 3.1. Points of agreement and disagreement and the research gap

The review of the previous studies reveals essential insights into the impact of cybercrime on the social relationships of university students during the COVID-19 pandemic.

There is a strong consensus among the studies that cybercrime incidents escalated during the pandemic period, primarily due to an increased reliance on online platforms for educational, communicative, and social purposes. Researchers unanimously confirm that this surge in cybercrime significantly impacted the social relationships among university students, leading to a rise in mistrust,

anxiety, and social withdrawal. The studies also concur on the necessity of implementing comprehensive digital literacy programs and enhancing cybersecurity measures as effective ways to mitigate the detrimental effects of cybercrime on university students' social relationships.

However, divergence is also evident among these studies. The differences arise chiefly from the chosen research methodologies, ranging from purely qualitative or quantitative methods to mixed methods and longitudinal study designs. The perception of the specific impact of cybercrime also varies among the studies. While some highlight an increase in social withdrawal, others underscore alterations in social dynamics or a general degradation of social relationships. Additionally, there are differences in the suggested countermeasures against cybercrime. While some studies emphasize the role of the university administration and law enforcement agencies, others advocate for the involvement of cybercrime prevention agencies or stress the importance of psychological support systems for students.

The research gap that emerges from these studies concerns the lack of a specific understanding of different types of cybercrimes and their unique impacts on students' social relationships. Most studies broadly categorize cybercrime without differentiating among various types, such as phishing, online harassment, or hacking. The studies also lack a detailed analysis of how specific aspects of social relationships are affected by these different types of cybercrime. Moreover, there is a scarcity of longitudinal studies that can provide insights into the evolving nature of cybercrime and its long-term effects on students' social relationships. Lastly, the effectiveness of the different strategies to combat cybercrime suggested by these studies hasn't been compared, leaving room for more comparative and evaluative research in this field.

### 4. Methodology

1. The study approach: To achieve its objectives, the study utilized a quantitative descriptive analysis methodology to analyze the initial data gathered on the topic under study
2. Research Design: The study follows a descriptive research design to gather qualitative data. This design provides a detailed picture of the situation at hand, in this case, the impact of cybercrime on the social relationships of university students during the COVID-19 pandemic.
3. Data Collection: Data is collected through a survey method. The survey contains a set of questions, scaled or open-ended, aimed at understanding the students' perspectives on the influence of cybercrime on their social relationships. This method is particularly useful for gathering data on people's perceptions and experiences.
4. Sampling: The sample for this study consists of 110 students from Ha'il University. This convenience sample was selected because they

were the most accessible subjects for this research during the academic year 2021–2022.

5. Data Analysis: The data will be statistically analyzed to test the research hypotheses. The analysis will consider students' average grades and examine variations concerning gender, academic major, and academic level.
6. Validity and Reliability: To ensure validity, the survey questions will be carefully designed to accurately measure the impact of cybercrime on students' social relationships. Reliability will be confirmed by conducting a pilot test on a small group of students before administering the survey to the entire sample.
7. Research Hypotheses:

**H1:** It is anticipated that the impact level of cybercrimes on the social relationships of university students will be high during the COVID-19 pandemic.

**H2:** No statistically significant differences are expected at the 0.05 significance level among students' average grades relating to their perceptions of the impact of cybercrime on social relationships at the university, attributed to the gender variable.

**H3:** No statistically significant differences are expected at the 0.05 significance level among students' average grades relating to their perceptions of the cybercrime impact on social relationships at the university, attributed to the academic major variable.

**H4:** No statistically significant differences are expected at the 0.05 significance level among

students' average grades relating to their perceptions of the cybercrime impact on social relationships at the university, attributed to the academic level variable.

8. Research Tools: The primary research tool used in this study was a survey designed to collect preliminary data on the study subject. An electronic questionnaire was developed for students using Google Drive Models, focusing on cybercrimes and their impact on social relations among university students during the COVID-19 pandemic, considering relevant theoretical frameworks and previous studies. The questionnaire included three main dimensions, with a total of thirty phrases. A five-point Likert scale was adopted for the student questionnaire, allowing responses from strongly agree to strongly disagree (Table 1).

The impact level of cybercrimes on social relationships among university students during the COVID-19 pandemic can be assessed by utilizing the arithmetic mean as a method of interpreting scale-based survey data (Rovai et al., 2013). To determine the length of the scale cells on the five-point scale, the range was calculated as the difference between the highest and lowest values (5 minus 1 = 4), and this value was divided by the number of scale cells to obtain the corrected cell length (4 minus 5 = 0.8). The corrected cell length was then added to the lowest value on the scale, which is one, to establish the upper limit of the scale cell (Table 2).

**Table 1:** The scores of the student questionnaire

Responses	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Phrases	5	4	3	2	1

**Table 2:** The average levels for research dimensions

Values	Level
If the average value of the phrase or dimension ranges between 1 and 1.8	Very low level
If the average value of the phrase or dimension ranges between 1.8 and 2.6	Low level
If the average value of the phrase or dimension ranges between 2.6 and 3.4	Average level
If the average value of the phrase or dimension ranges between 3.4 and 4.2	High level
If the average value of the phrase or dimension ranges between 4.2 and 5	Very high level

9. Validity and reliability tests:

- Validation: Content Validity "Logical Validity" has been made to verify this type of validity for the tool; the researchers reviewed literature, theoretical frameworks, and previous studies that addressed the research dimensions. Then, they analyzed this theoretical literature to determine the research dimensions. The tool was presented to five (5) arbitrators from the faculty of the College of Arts and Humanities at the University of Ha'il in Saudi Arabia to express their opinion on the validity of the tool in terms of the linguistic correctness of the phrases and their association with the research dimensions. Some phrases were modified, added, or deleted, and some linguistic errors were corrected (Morrow, 2005). Based on this, the tool was formulated in its final form.

- Reliability: The stability of the student questionnaire was calculated using the Spearman-Brown formula for split-half reliability. This was applied to a sample of 15 individuals from the students at the University of Ha'il (outside the research community framework).

Table 3 shows that the reliability coefficients for each of the dimensions possess a high degree of stability, and the results based on them can be relied upon. Therefore, the tool, in its final form. The reliability of the student questionnaire was calculated using the Spearman-Brown formula for split-half reliability, applied to a sample of 15 individual students at Ha'il University (outside the research community). Each dimension's statements were divided into two halves. The first section encompassed values obtained from the response to the individual statement, while the second section

included values representing the paired statements, as follows. Table 3 reveals that the reliability coefficients for the dimensions exhibit a high degree of stability. Therefore, their results can be relied upon. This finalizes the tool in its ultimate form.

The data was processed using a computer with the Social Sciences Statistical Package (SPSS.V. 24.0). The following statistical methods were applied: frequency and percentage, mean, standard deviation, range, Spearman-Brown formula for split-half reliability, Pearson correlation coefficient, T-test for two independent samples, and one-way analysis of variance (ANOVA).

**5. Results**

**5.1. Characterizing the research community of Ha'il university students**

Table 4 presents a concise description of the participants from Ha'il University in the research, consisting of 110 students. Table 4 includes

quantitative variables such as age and gender distribution, academic levels, and specializations. It also provides data on the students' usage of electronic applications. The average age of the participants is 22 years, with a standard deviation of 2. The gender distribution shows 49 male students (44.5%) and 61 female students (55.5%). The academic levels range from first to seventh, with varying proportions across levels. Most students specialize in the humanities (44.5%), followed by scientific and engineering fields (32.7%) and health-related disciplines (22.7%). Table 4 highlights the use of electronic applications, with Blackboard being the most popular for educational purposes (82.7%), followed by WhatsApp, YouTube, Snapchat, and Twitter. Overall, Table 5 provides key insights into the demographic, academic, and electronic usage characteristics of the participants, contributing to a comprehensive understanding of the research sample.

**Table 3:** Reliability of student questionnaire assessed via spearman-brown split-half method (n=15)

Dimensions	R value	Spearman Brown coefficient
1. Impact of cybercrimes on social relations with peers among university students amid the COVID-19 pandemic	0.895**	0.944
2. Impact of cybercrimes on social relations with teachers among university students amid the COVID-19 pandemic	0.659**	0.794
3. Impact of cybercrimes on social relations with family among university students amid the COVID-19 pandemic	0.880**	0.936
4. Stability of the student questionnaire as a whole	0.759**	0.863

\*\* : Significant at 0.01

**Table 4:** Description of Ha'il University student participants in the research (n=110)

Quantitative variables					
	—	σ	No.	Academic level	K
Age	22	2	1	First level	22
Gender	K	%	2	Second level	9
Male	49	44.5	3	Third level	14
Female	61	55.5	4	Fourth level	10
Total		110	5	Fifth level	17
Specialization	K	%	6	Sixth level	11
Humanities	49	44.5	7	Seventh level	15
Health	25	22.7	8	Eighth level	12
Scientific and Engineering	36	32.7			
Total		110		Total	110
Electronic applications	K	%			
Blackboard	91	82.7			
WhatsApp	65	59.1			
YouTube	43	39.1			
Snapchat	42	38.2			
Twitter	32	29.1			

σ : Denotes standard deviation; K: Represents frequency; —: Represents mean

Table 4 illustrates that:

- The average age of students at Ha'il University is 22 years, with a standard deviation of approximately two years.
- Most students at Ha'il University are female, constituting 55.5% of the population, whereas males make up 44.5%.
- The highest percentage of students at Ha'il University are enrolled in the humanities (44.5%), followed by scientific and engineering specialties (32.7%), and finally health specialties (22.7%).
- The largest proportion of students at Ha'il University are registered at the first academic level (20%), followed by the fifth level (15.5%), then the

seventh level (13.6%), and finally the second level (8.2%).

- Most students at Ha'il University frequently use the following electronic applications in their education: Blackboard (82.7%), followed by WhatsApp (59.1%), YouTube (39.1%), and finally Twitter (29.1%).

**5.2. Testing the first hypothesis of the research**

Table 5 reveals that the overall influence of cybercrimes on the social relationships of university students during the COVID-19 pandemic is considerable, as evidenced by an aggregate mean score of 4.19. The breakdown of this impact, based



on the calculated mean, is as follows: the most significant effect is on the students' familial relationships, with a mean score of 4.29. This is followed by the impact on peer relationships, registering a mean of 4.16, and lastly, the impact on student-teacher relationships, with a mean of 4.13. These findings lead us to affirm the research's first hypothesis, suggesting that "The influence of cybercrimes on the social relationships of university students during the COVID-19 pandemic is expected to be significant."

**5.3. Testing the second hypothesis of the research**

Table 6 indicates that significant differences exist at the (0.05) level between the mean perceptions of male and female students on how cybercrimes affect family relationships during the COVID-19 pandemic, with female students' scores being higher.

Conversely, there are no significant differences at the (0.05 a) level between male and female students' perceptions of how cybercrimes influence their relationships with peers, teachers, and the overall social relationships among university students during the pandemic. Hence, the second research hypothesis is partially accepted.

**5.4. Testing the third hypothesis of the research**

Table 7 reveals no significant discrepancies at the 0.05 significance level among student scores when sorted by specialization (humanities, health, scientific, and engineering). This pertains to their understanding of cybercrime's impact on social relationships with peers, teachers, family, and overall university social relationships amid the COVID-19 pandemic. Hence, the research's third hypothesis is accepted.

**Table 5:** The extent of cybercrime influence on social interactions among university students amidst the COVID-19 pandemic (n=110)

Rank	Dimensions	Mean	Standard deviation	Level
2	Effect of cybercrimes on social relationships with peers among university students during the COVID-19 pandemic	4.16	0.5	High
3	Effect of cybercrimes on social relationships with teachers among university students during the COVID-19 pandemic	4.13	0.47	High
1	Effect of cybercrimes on social relationships with family among university students during the COVID-19 pandemic	4.29	0.58	Very high
	The overall impact of cybercrimes	4.19	0.46	High

**Table 6:** The differences in male and female students' perception of cybercrimes' impact on social relationships amid the COVID-19 pandemic (n=110)

Dimensions	Research community	Count (n)	Arithmetic mean	Standard deviation	Degrees of freedom (df)	T value	Significance
Impact of cybercrimes on social relationships with peers	Male	49	4.18	0.49	108	0.529	Not significant
	Female	61	4.13	0.51			
Impact of cybercrimes on social relationships with teachers	Male	49	4.2	0.47	108	1.422	Not significant
	Female	61	4.07	0.47			
Impact of cybercrimes on social relationships with family	Male	49	4.16	0.55	108	-2.268	*
	Female	61	4.4	0.59			
The overall impact of cybercrimes	Male	49	4.18	0.47	108	-0.254	Not significant
	Female	61	4.2	0.45			

\*: Significant at 0.05

**Table 7:** Variance analysis depicting the impact of cybercrimes on the social relationships among university students during COVID-19, categorized by their field of study (n=110)

Dimensions	Source of variance	Sum of squares	Degrees of freedom (df)	Mean square	F value	Significance
Impact of cybercrimes on social relations with colleagues	Between groups	0.560	2	0.280	1.122	Not significant
	Within groups	26.692	107	0.249		
	Total	27.252	109			
Impact of cybercrimes on social relations with teachers	Between groups	0.128	2	0.064	0.283	Not significant
	Within groups	24.187	107	0.226		
	Total	24.315	109			
Impact of cybercrimes on social relations with family	Between groups	0.752	2	0.376	1.116	Not significant
	Within groups	36.053	107	0.337		
	Total	36.806	109			
Overall dimensions of the impact of cybercrimes	Between groups	0.177	2	0.089	0.420	Not significant
	Within groups	22.545	107	0.211		
	Total	22.722	109			

## 5.5. Testing the fourth hypothesis of the research

Table 8 indicates that there are no statistically significant differences at a significance level of (0.05 a) among the means of students' grades according to their academic level (from the first level to the eighth level) regarding their perception of the impact of electronic crimes on social relationships with

colleagues, teachers, and family during the COVID-19 pandemic. Additionally, there are no significant differences in the overall impact of electronic crimes on social relationships among university students during the pandemic. Therefore, we accept the fourth hypothesis.

**Table 8:** ANOVA for the impact of electronic crimes on social relationships among university students during COVID-19, by academic level

Dimensions	Source of variation	Sum of squares	Degrees of freedom (df)	Mean square	F value	Significance
Impact of electronic crimes on social relationships with colleagues	Between Groups	3.705	2	1.853	2.293	Not significant
	Within groups	23.547	102	0.231		
	Total	27.252	104			
Impact of electronic crimes on social relationships with teachers	Between Groups	2.788	2	1.394	1.887	Not significant
	Within groups	21.526	102	0.211		
	Total	24.315	104			
Impact of electronic crimes on social relationships with family	Between Groups	3.090	2	1.545	1.336	Not significant
	Within groups	33.715	102	0.331		
	Total	36.806	104			
The overall impact of electronic crimes	Between Groups	2.478	2	1.239	1.784	Not significant
	Within groups	20.243	102	0.198		
	Total	22.722	104			

## 6. Discussions

The study findings provide insights into the characteristics of Ha'il University students and the impact of electronic crimes on social relationships during the COVID-19 pandemic. The average age of the students was 22 years, with a standard deviation of approximately two years. The increased reliance on the internet for academic purposes exposes students to the risks associated with electronic crimes. Females comprised 55.5% of the sample, reflecting the university's demographic composition. Humanities studies were the most prevalent discipline (44.5%), followed by science and engineering (32.7%) and health-related fields (22.7%). The distribution of students across academic levels highlighted the exposure of different levels to electronic crimes. Blackboard was the most widely used educational application (82.7%), followed by WhatsApp (59.1%), YouTube (39.1%), and Twitter (29.1%). Universities play a vital role in protecting students by addressing the risks of electronic crime and promoting information security. Comprehensive policies and educational programs are necessary to ensure students' well-being and foster healthy social connections.

The research findings support the significance of the impact of electronic crimes on social relationships among university students during the COVID-19 pandemic. Universities play a crucial role in addressing these challenges and should be integrated with society to establish policies and regulations combating electronic crimes (Tomar, 2014). There were no statistically significant differences between male and female students in their perception of the impact of electronic crimes on social relationships with peers and teachers during the pandemic. Both genders shared similar

perceptions, emphasizing the need for universities to protect students from the negative aspects and risks of the virtual world. Universities have a responsibility to address societal issues, meet societal needs, and shape the development of young individuals while safeguarding them from contemporary risks and threats (Tomar, 2014). However, statistically significant differences (at the 0.05 level) were found between male and female students in their perception of the impact of electronic crimes on social relationships with family members during the COVID-19 pandemic. Female students scored higher on this dimension, indicating a greater awareness of the negative impact of electronic crimes on social relationships within their families. The continuous online engagement of young individuals and their exposure to various websites and platforms make them vulnerable to numerous cybercrimes. Therefore, the role of universities becomes crucial in addressing and mitigating such crimes (Tomar, 2014).

The research findings indicate no statistically significant differences between male and female students in their perception of the impact of electronic crimes on social relationships during the COVID-19 pandemic (Johnson and Smith, 2019). Both genders experience significant adverse effects on their social relationships due to electronic crimes, which aligns with previous research highlighting the negative impact of electronic crimes on students' academic performance and family relationships (Azionya and Nhedzi, 2021). This emphasizes the role of university leadership in combating these crimes and implementing necessary measures to create a safe environment and raise awareness (Dorasamy and Rampersad, 2014).

Furthermore, the research findings do not support the third hypothesis, as there were no

statistically significant differences among students' perceptions of the impact of electronic crimes on social relationships based on their majors (humanities, health sciences, and science/engineering) (Burney and Khan, 2010). This suggests a consensus among students from different majors regarding the negative influence of electronic crimes on their social relationships with peers, supporting previous research that highlights the detrimental effects of electronic crimes on students' studies and family relationships (Dorasamy and Rampersad, 2014). It emphasizes the importance of universities implementing policies and regulations to combat these crimes and promote safe internet usage (Azionya and Nhedzi, 2021).

Similarly, the research findings reveal no statistically significant differences among students' average scores based on their academic levels regarding the impact of electronic crimes on social relationships with teachers during the COVID-19 pandemic (Tomar, 2014). This suggests a consensus among students across different academic levels regarding the influence of electronic crimes on their interactions with teachers, reinforcing the role of universities in developing students' awareness of electronic crimes through specialized courses, seminars, and collaborative research (Masrom et al., 2021). Additionally, there are no statistically significant differences among students' average scores based on their academic levels regarding the impact of electronic crimes on social relationships with family members during the COVID-19 pandemic (Masrom et al., 2021). This highlights the need for universities to intensify efforts to increase students' awareness of electronic crimes and promote cooperation between the university and private sectors to combat these crimes effectively (Burney and Khan, 2010).

In conclusion, the research findings emphasize the need for universities to address the impact of electronic crimes on students' social relationships during the COVID-19 pandemic. It highlights the role of universities in creating a safe environment, raising awareness, and implementing measures to combat electronic crimes. The findings indicate that both male and female students, regardless of their majors and academic levels, are susceptible to the negative effects of electronic crimes on their social relationships. Universities should prioritize the integration of policies and educational programs that promote safe internet usage and foster collaboration with other institutions and the private sector to address these issues effectively.

## 7. Conclusions

In conclusion, the study findings provide valuable insights into the impact of electronic crimes on social relationships among university students during the COVID-19 pandemic. The research tools used in the study demonstrated content validity through a thorough review of relevant literature and the input of expert arbitrators. The stability of the student

questionnaire was confirmed through split-half reliability testing, indicating that the tool can be relied upon to measure the research dimensions accurately. The results of the study revealed several important findings. Firstly, the overall impact of cybercrimes on social relationships among university students was found to be significant, with the highest effect observed on familial relationships, followed by peer relationships and student-teacher relationships. These findings support the first research hypothesis, highlighting the need to address the influence of cybercrimes on social relationships. Secondly, gender differences were observed in the perception of the impact of cybercrimes on family relationships, with female students scoring higher than male students. However, no significant gender differences were found in the perception of the impact on relationships with peers, teachers, and overall social relationships. This partially supports the second research hypothesis.

Thirdly, no significant differences were found among students of different majors regarding their perception of the impact of cybercrimes on social relationships. This implies that the influence of cybercrimes is consistent across various academic disciplines and supports the third research hypothesis.

The study underscores the importance of universities in addressing electronic crimes and protecting students from their adverse effects. It suggests various measures to mitigate the spread of cybercrimes, including organizing joint meetings, conducting informative sessions, arranging conferences and workshops, promoting creative thinking, introducing specialized courses, establishing a diploma in cybercrimes, and fostering a culture of social peace and intellectual security among students.

In conclusion, the study highlights the need for universities to play an active role in combating cybercrimes and safeguarding the social relationships of their students. By implementing the proposed measures and raising awareness about electronic crimes, universities can create a safer environment and empower students to navigate the digital world responsibly. Collaboration with families, civil society, and relevant stakeholders is essential in addressing the challenges posed by cybercrimes in the university setting.

The study "Cybercrime Impact on Student Social Relations Amid COVID-19: A Ha'il University Study" presents a novel exploration of the effects of cybercrimes on Ha'il University students' social relationships during the COVID-19 pandemic. Distinctively, it delves into the nuanced differences across varied social connections—peers, instructors, and families—and highlights gender-based variations, particularly the increased awareness of cybercrimes among female students in familial settings. Beyond the identification of the issues, the research provides actionable initiatives, emphasizing the integration of cybercrime education into

academic curricula and the establishment of victim support mechanisms. These findings, supported by a robust sample size, offer valuable insights for future research and policy development.

The recommendations provided in the study aim to mitigate the spread of cybercrime and protect social relationships in universities. These recommendations are based on the findings of the study and are as follows:

1. Establish Collaborative Efforts: Organize joint meetings and collaborations with families, civil society organizations, and relevant stakeholders to discuss the issue of cybercrimes, share knowledge, and develop preventive and remedial strategies.
2. Enhance Awareness Programs: Conduct informative and guidance sessions for families to raise awareness about the risks of cybercrimes and educate them about preventive strategies.
3. Conduct Comprehensive Training: Arrange conferences, seminars, workshops, and intensive training programs for students, families, peers, universities, and the wider community to educate them about the risks associated with cybercrimes and how to effectively deal with them.
4. Foster Creative Thinking: Activate the role of universities in fostering students' creative thinking skills through competitions, projects, and activities, enabling them to develop problem-solving abilities and enhance their resilience against cybercrime.
5. Emphasize Cyber Security Reports: Give importance to the discussion of cyber security reports and related events concerning cybercrimes to keep students updated on emerging trends, new threats, and effective countermeasures in the field of cybersecurity.

Study limitations can be summarized as follows:

1. Small Sample Size: The study was conducted with a relatively small sample size, which may limit the generalizability of the findings to a larger population. Future research with a larger and more diverse sample could provide a broader understanding of the topic.
2. Self-Report Bias: The data collected in this study relied on self-reported measures, which may be subject to bias. Participants may have provided responses that they believed were socially desirable or may have inaccurately recalled their experiences, leading to potential measurement errors.
3. Non-Response Bias: Some students refused to respond to the questionnaire due to their personal experiences as victims of cybercrime. This could introduce a bias in the data, as those who chose not to participate may have had different experiences or perspectives regarding the impact of cybercrimes on social relationships.
4. Ethical Approval Delays: The researchers experienced delays in obtaining ethical approval from the research committee for study tools. These

delays may have affected the timeline and implementation of the study, potentially impacting the sample size or data collection process.

5. Cultural Context: The study was conducted at a specific university in a particular cultural context, which may limit the generalizability of the findings to other settings or cultural backgrounds. Different cultural norms and attitudes towards cybercrimes may influence their impact on social relationships.

It is important to consider these limitations when interpreting the study's findings and to recognize the potential impact they may have on the generalizability and validity of the results. Future research should aim to address these limitations to enhance the overall understanding of the topic.

Based on the findings and limitations of this study, several areas for future research and action can be identified:

1. Replication with a Larger Sample: Future studies should aim to replicate the findings using a larger and more diverse sample from multiple universities to enhance the validity and generalizability of the results.
2. Longitudinal Studies: Utilizing a longitudinal research design would allow for the examination of the long-term effects of cybercrimes on social relationships among university students and provide insights into the changes and patterns over time.
3. In-depth Exploration of Cybercrime Types: Further research should delve into specific types of cybercrimes, such as cyberbullying, online harassment, and identity theft, to gain a better understanding of their prevalence and the specific impacts they have on social relationships.
4. Intervention and Prevention Programs: Universities should develop and implement targeted intervention and prevention programs to raise awareness about cybercrimes, promote safe online behaviors, and equip students with strategies to protect themselves and maintain healthy social relationships.
5. Collaboration between Academia and Industry: Collaborative efforts between universities, industry stakeholders, and government agencies can facilitate the exchange of knowledge and expertise in combating cybercrimes, leading to the development of effective preventive measures and policies.
6. Integration of Cybersecurity Education: Integrating cybersecurity education into the curriculum across various disciplines can enhance students' understanding of cyber threats, ethical responsibilities, and protective measures, enabling them to navigate the digital landscape safely and responsibly.
7. Exploration of Technological Solutions: Future research should focus on exploring technological solutions, such as advanced detection systems and user-friendly interfaces prioritizing privacy and

data protection, to effectively address cybercrimes and enhance online security.

The findings of this study have several implications for researchers, policymakers, educational institutions, and society at large. These implications include:

1. **Increased Awareness:** The study highlights the need for raising awareness about the impact of cybercrimes on social relationships among university students. Educational institutions, parents, and the wider community should be informed about the risks associated with cybercrimes and the measures to protect against them.
2. **Policy Development:** The study underscores the importance of developing comprehensive policies and regulations to address cybercrimes and protect university students. Policymakers should consider the evolving nature of cyber threats and ensure that appropriate legal frameworks are in place to combat such crimes effectively.
3. **Educational Programs:** Educational institutions should incorporate cybercrime awareness and prevention programs into their curriculum. Students should be educated about the risks, consequences, and preventive measures related to cybercrimes. These programs can equip students with the knowledge and skills necessary to navigate the digital world safely.
4. **Support Systems:** The study emphasizes the importance of providing support systems for university students who have been victims of cybercrimes. Counseling services, helplines, and peer support networks can be established to assist students in dealing with the emotional and psychological impact of cybercrimes.
5. **Interdisciplinary Collaboration:** Addressing the complex issue of cybercrime requires interdisciplinary collaboration. Experts from various fields, including cybersecurity, law enforcement, psychology, and education, should collaborate to develop comprehensive strategies and interventions to mitigate the impact of cybercrimes on social relationships.
6. **International Cooperation:** Cybercrimes are a global concern, and international cooperation is essential to combating them. Collaboration between countries, sharing of best practices, and harmonizing laws and regulations can contribute to a more effective response to cybercrimes.
7. **Technological Solutions:** Technological advancements can play a significant role in combating cybercrime. Researchers and industry professionals should work together to develop advanced security measures, encryption techniques, and artificial intelligence-based solutions to detect and prevent cybercrimes.
8. **Continuous Research:** Ongoing research is necessary to stay updated with the evolving nature of cybercrimes and their impact on social relationships. Further studies can delve into

specific aspects of cybercrime, explore emerging trends, and evaluate the effectiveness of preventive measures and interventions.

9. **Social Responsibility:** The study highlights the importance of fostering a culture of responsible digital behavior among university students. Encouraging ethical online practices, promoting empathy, and discouraging negative online behaviors can contribute to a healthier and safer online environment.
10. **Public-Private Partnerships:** Collaboration between the public and private sectors is crucial in addressing cybercrimes. Governments, educational institutions, and industry stakeholders should work together to share resources, expertise, and knowledge to combat cybercrimes effectively.

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## Compliance with ethical standards

## Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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