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A Survey on Cyber Security awareness among college students in Tamil Nadu

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Abstract. The aim of the study is to analyse the awareness of cyber security on college students in Tamil Nadu by focusing various security threats in the internet. In recent years cybercrime is an enormous challenge in all areas including national security, public safety and personal privacy. To prevent from a victim of cybercrime everyone must know about their own security and safety measures to protect by themselves. A well-structured questionnaire survey method will be applied to analyse the college student's awareness in the area of cyber security. This survey will be going to conducted in major cities of Tamil Nadu by focusing various security threats like email, virus, phishing, fake advertisement, popup windows and other attacks in the internet. This survey examines the college students' awareness and the level of awareness about the security issues and some suggestions are set forth to overcome these issues.

1. Introduction

Now-a-days, protecting the integrity and confidentiality of the information in the system of complex networks is very important and challenging. And most of the people who are connected to these networks are students. Curiosity and revenge may be primary reasons for students to get involved in cyber-crimes. Most of the time students are not aware of the implications of cybercrime. Girls are the most found victims of the cyber-crime. Many reports Colleges and universities show the cyber-attacks rates, with many of hacking attempts onto the information systems. While social networks and bank account details are also at higher risk, education institutions are facing risks of losing valuable intellectual property and their research data such as patents awarded to the professors and students, and also the personal information about the students ,staff and faculty. Because of the higher frequency of hacking attacks on the institutions of higher education, the need for cyber awareness has been increased [1].

Today the Internet is used for all aspects of everyone's daily life. People connect with friends and family, establish business and bank online and many other services like Virtual healthcare and education, video call etc. So the connections with the technology have been increased. However, being continuously connected causes increased risks. All are facing cyber threats against critical infrastructure and economy. As individuals, cyber security risks can lead to create threats to finances, identity, and privacy. To address the cyber security awareness among college students in higher education institutions, there is a need for some cyber security related awareness program. Today, computers and the Internet have become critical resources in everyday work and studies [2]. This



survey will help to analyze Cyber Security Awareness among college students in Tamil Nadu and enlighten students to the dangers and challenges that are prevalent in cyberspace.

2. Methodology

Our survey method is an online questionnaire method. It is a set of prepared questions which are distributed to a huge number of selected participants. The participants are selected using samples of target population and the purpose. The following Figure 1 shows architecture of a survey research [3]

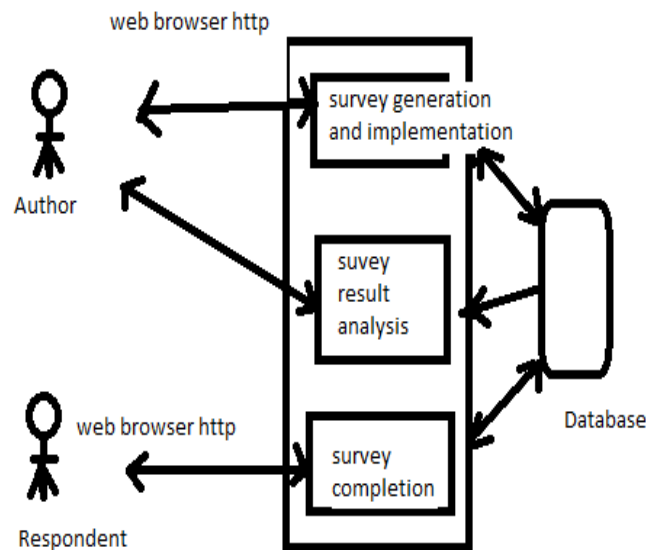


Fig. 1. Architecture of a survey research.

The population is the entire group of entities that we are interested to examine. The sample is a subset of the population that is the actual number of examination. In our survey we aimed to do the survey overall Tamil Nadu as population and we fixed sample size is 500 students in five major cities that are randomly taken each city having 100 students. The following table shows the population and sample size of our survey research.

Table 1. Sample Size – Tamil Nadu

Cities	Sample size 500
Chennai	100
Salem	100
Coimbatore	100
Vellore	100
Madurai	100

Survey questions are framed based on various cyber security issues like email, virus, phishing, fake advertisement, popup windows and other attacks in the internet. These survey questions are sent by Google Docs online survey to the students. The survey question covers on User ID's, Passwords,

firewall, malicious protection, computer viruses, worms, Trojans, remote access, phishing, patching, pop-up windows and fake advertisements [4-5]

2.1. Following key points are used to frame the awareness on User ID and password:

- Periodical change of password
- Reusing previous passwords.
- Using the same password for each of their accounts.
- Sharing Password with Everyone.
- If their computer attempts to save their password by showing click on No or yes
- Using a password that is found in a dictionary
- If they think their password has been compromised then taking further step to recover it
- Making the password as lengthy as possible and strong like minimum eight or more than 8 characters, inclusion of special characters, numbers, using all case letters etc.

2.2. To identify awareness on Home Computer Protection, the following key points are considered to frame the survey questions.

- Shut down, log off or lock the computer with password, when the users are away from their PC.
- If users have a modem, making sure it does not automatically accept incoming calls (auto-answer mode).
- If necessary, remove personal, confidential or sensitive data before giving the PC to be repaired or replaced.

2.3. To analyze the awareness about the Installation on firewall and the need of the Anti-virus software and updating for the same we framed some of the questions mentioned below.

- If the users are connected to a network, whether they store files in folders set aside for them.
- Whether data is saved to CDs or floppy disks regularly while the system is not connected to a network.
- Ensuring that backups reflect the most current information by copying the data on a regular basis after making all changes.
- Saving the original installation CDs/diskettes to use as their backup for their PC software.

2.4. At home, disconnecting the PC from the Internet and making a full virus scan gives virus free system. The following keys are considered to frame the survey questions to identify the awareness on virus.

- Checking their anti-virus software at least every week or set it for automatic updates by knowing the new, and fast spreading worms and viruses are released every day.
- Before implementing or using any software from any source, should check for viruses with a current virus scanner if Students do not have a virus scanner installed on their PC and they should call some organization representative.
- Do not install free software on your computer from an untrusted source.
- Considering the extensions such as: .bat, .cmd, .exe, .pif, .scr, or .zip through content filtering software.
- Depending on the extent of the infection, it needs to re-install the operating system.

3. Survey Results and Analysis

Survey questions are framed with the combinations of open ended questions multiple choice questions and matrix questions with some demographic questions. Matrix questions are framed having options like strongly agree, tend to agree, strongly disagree and tend to disagree. All the questions are posted on Google doc and sent as an email link to the selected students in each category in five major cities (Chennai, Salem, Coimbatore, Vellore, Madurai) in Tamil Nadu. Finally survey is conducted with the sample size of 500 students overall Tamil Nadu to analyse Cyber security awareness among the college students in Tamil Nadu. Data validation ensures that the online survey questionnaires are completed and present the consistent data. In this step, we eliminated the questions that were not answered by most respondents in the data analysis as this would result to bias in the results. The response from each of the college students is recorded in *google doc* separately for each of the cities. Number of responses received from each of the cities is shown in Table 2.

Table 2. Number of Responses

Cities	Number of Responses
Chennai	82
Salem	73
Coimbatore	76
Vellore	88
Madurai	71

Out of 500 invites sent 390 responses received and some of the entries are not complete. The incomplete form details from each of the details considered is given in Table 3.

Table 3. Number of Complete Responses

Cities	Number of Responses
Chennai	80
Salem	71
Coimbatore	75
Vellore	87
Madurai	66

From the 379 complete responses male and female respondents are separated and the percentage of awareness among them was analyzed. The number of male and female respondents' details is given in Table 4. The survey is taken on consideration of awareness about major cyber-attacks such as virus attack from unknown sources, email/Message phishing, password attacks, and threats for publishing personal details in social networking sites, and based on the response the awareness of college students between two groups. The t-test is calculated for these two groups. The t-value is 3.51812 and P-value is .003934. The result is significant at $p < .05$.

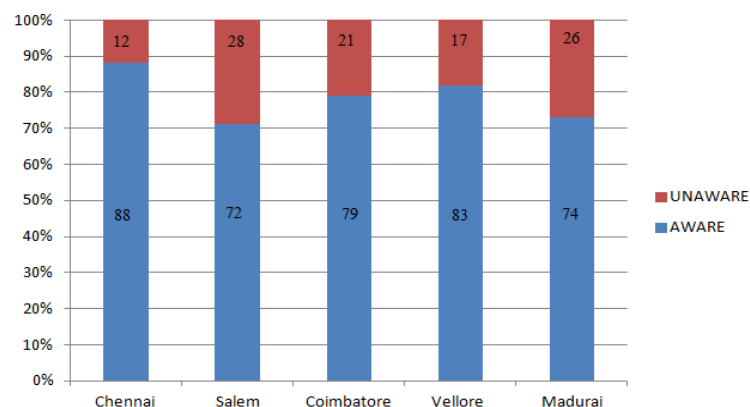
Table 4. Number of Male and Female Responders

Cities	Number of Male	Number of Female
Chennai	49	31
Salem	41	30
Coimbatore	39	36
Vellore	52	35
Madurai	37	29

4. Test Cases:

4.1. Case 1: Virus attack

From the response received, more than 70% of students from all the cities are conscious about the basic virus attacks and are using antivirus software (updating frequently) or Linux platforms to safeguard their system from virus attack. Remaining students are not using any antivirus and are the victims for virus attack. 11% of them are using antivirus but they are not updating the antivirus software. More than 97% of them don't know the source of the virus. The students using antivirus and updating that regular intervals are considered to be aware about the virus attacks and students not using antivirus software's or updating it at regular intervals are considered as unaware about virus attack. The graphical interpretation of virus attack awareness among different cities is shown in the Figure 2.

**Fig. 2.** Virus Attack Awareness

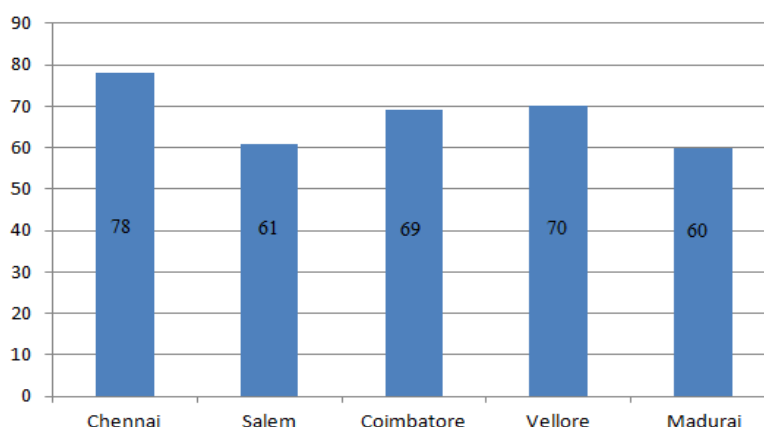
4.2. Case 2: Phishing

Phishing in email/message is taken into account. Almost more than 60% of students from all the cities received phishing emails/messages in any form. But the percentage of persons receiving phishing emails/messages varies between the cities. Number of persons responded those E-mails/messages without knowing the source is given in Table 5.

Table 5. Number of Students Responded Phishing E-Mail/Messages

Cities	Number of Students
Chennai	3
Salem	1
Coimbatore	2
Vellore	4
Madurai	2

Very less students only responded those E-mails/messages and those students claimed that they responded because for identifying the purpose of looking to which extent these mails will take and added that they all know that is fake E-mail/messages only. Other students simply marked that E-mail/Message as spam or simply ignored that mail/message. Only 10 students from overall 379 claimed that they will complain about this phishing mail/messages to Cyber Crime wing. The graphical representation of number of students received phishing mail/message is shown in Figure 3. So in the case of phishing attack all the students are aware in all the cities.

**Fig. 3.** Number of Students Receiving Phishing E-Mails/Messages

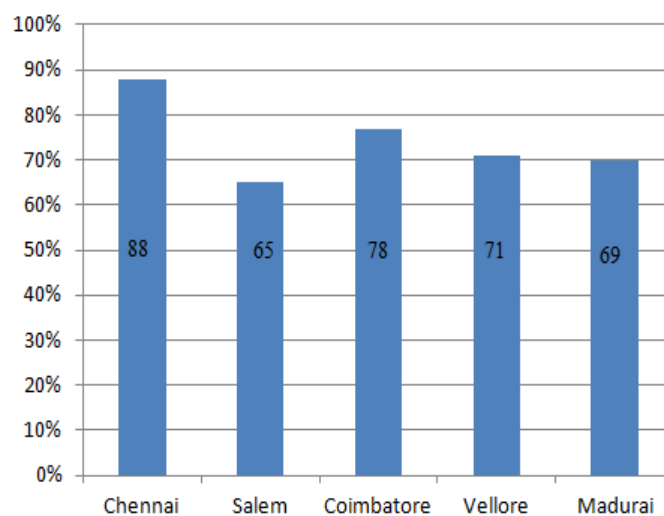
4.3. Case 3: Password strength

Password strength depends upon the combination of alphanumeric characters, Special characters, length of the password and changing the passwords frequently. The response received as shown in Table 6.

Table 6. Password Strength

Cities	Changing password frequently	Using alphanumeric characters and Special characters	Password length more than Eight
Chennai	25	10	61
Salem	18	7	52
Coimbatore	19	12	58
Vellore	22	18	66
Madurai	15	11	55

Students considering at least one of all these three categories for their password strength are considered to more aware about the misuse of passwords and the percentage of awareness among cities are represented in Figure 4.

**Fig. 4.** Percentage of Students Using Strong Password.

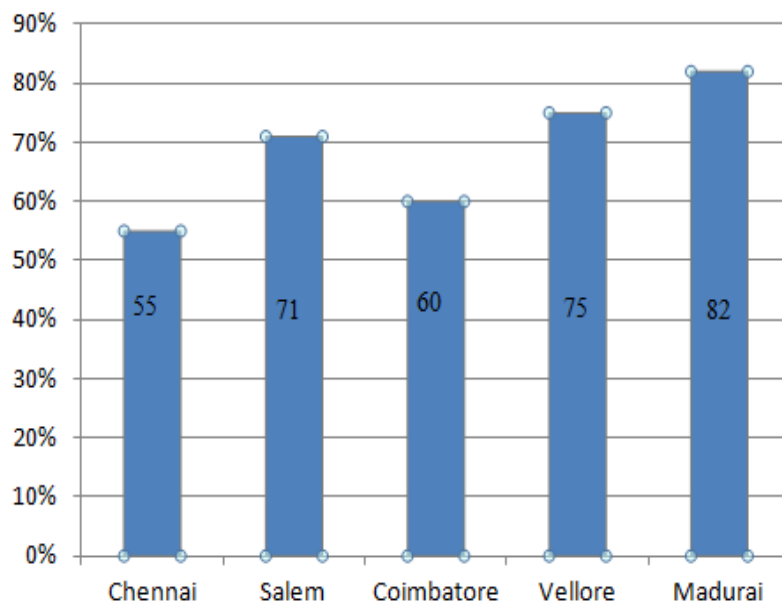
4.4. Case 4: Misuse of Social network

Identity theft and publishing spam about a person is common is major threats in social networks. All students are in the part of any social networks. So the survey is conducted to identify the amount of personal data each students publishing in the social networks. The details about the response received are shown in Table 7.

Table 7. Number of Students Publishing Their Identity In Any Format

Cities	Uploading original Display picture	Accepting unknown persons	Updating locations	Career progress
Chennai	60	9	30	52
Salem	42	2	10	45
Coimbatore	55	4	13	40
Vellore	59	4	9	51
Madurai	40	2	5	31

Accepting unknown persons in social network is considered to be the major threat in social network compared to any other identity outsourcing. After that, updating locations every time where ever they go is second major personal data of a person published in social networks. Compared to these two, career details and having original display picture has very less impact on publishing. Based on the severity, the percentage of students publishing their personal identity is considered to be unaware and is represented in Fig 5.

**Fig. 5.** Percentage of identity theft unawareness in social network

From the data received, students the percentage of awareness about major attacks through internet is given in Table 8.

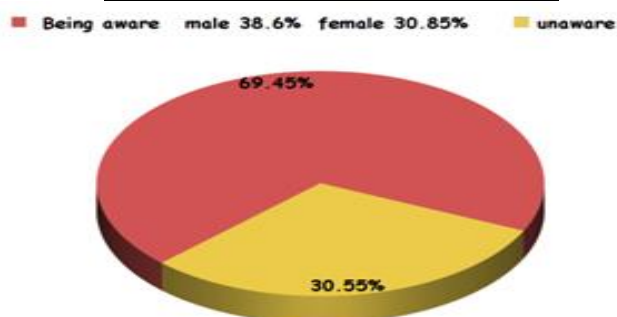
Table 8. Percentage of awareness for each of the cases considered

Cities	Virus attack (%)	Phishing (%)	Password strength (%)	Misuse of Social Network (%)
Chennai	88	98	88	45
Salem	72	99	65	21
Coimbatore	79	98	78	40
Vellore	83	99	71	25
Madurai	74	99	69	18

This interpretation shows that students are more unsafe in social networks and they are aware of phishing and virus attack. The awareness on Password strength has to be spread among students. Overall cyber security awareness among the college students in Tamil Nadu is analyzed by considering different security issues as mentioned above (email phishing, password strength, malicious codes and pop up windows) and the percentage is calculated and it is given in Table 9.

Table 9. Cyber Security Awareness in Each City

Cities	Being aware (%)
Chennai	79.75
Salem	64.25
Coimbatore	73.75
Vellore	64.5
Madurai	64

**Fig. 6.** Cyber security awareness among college students in Tamil Nadu

The cyber security awareness among college students in Tamil Nadu is measured as 69.45%. in which male is 38.6% and female is 30.85%.

5. Conclusion

Cyber threats are one of the gravest national security, all are facing today. Visiting the websites which is already infected with malware, replying phishing e-mails, storing logging information in an third party location, or even sharing confidential information over the phone, exposing personal information to social networking are tend to steal personal information of common people. This survey result shows that the college students in Tamil Nadu are having above average level of awareness on Cyber related threat issues which can help them to protect themselves from the cyber-attacks. Fully fledged cyber awareness will make students to protect themselves from hackers and hence the awareness has to be created in higher level.

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