IPC Knowledge, Attitude and Practice among freshman year Dental students in a university, Songkhla, Thailand

Wanchada Limsawat

Prince of Songkla University

Abstract: **Due to the Pandemic of COVID-19 that was an emerging disease causing negative consequences worldwide. Especially, medical personnels and medical students because medical personnel and medical students were mostly risk to contract infection from the COVID-19 because of the study and workplace that lead to the higher chance to intimidate with patients.Therefore, medical student should learn about Infection Prevention and Control in order to prevent and decrease risk of contracting infection.**

Purpose: **To assess IPC knowledge, Attitude and Practice among dental students**

Methodology: **This is a cross sectional study, using online form to collect data from first year dental students from a university in Songkhla, Thailand. Descriptive statistics, Pearson's correlation and generalized linear model were used to analyze the results.**

*Findings***: A total of 45 students participated in the study, 33 (73.3%) female and 12 (26.7%). Participants revealed a moderate level of IPC knowledge, correctly answering 9.18 from 15 questions (SD=2.27) and a moderate level of attitude toward IPC (M=18.67, SD=2.34). A good level of IPC practice was found among participants (M=22.91, SD=2.20). The analysis from the generalized linear model, gender was a predictive factor for IPC practice adoption.**

Conclusion: **Freshman students had a moderate IPC knowledge and a moderate attitude toward IPC but a good level of IPC practice was found from the study.**

Keywords: **IPC, dental student, COVID-19.**

1. INTRODUCTION

Coronavirus 2019 disease was an emerging disease that was found for the first time in Wuhan ,China. It caused illness ranging from the common cold to a severe pneumonia and had not been previously found in Humans. By March 2020 The Coronavirus 2019 (COVID-19) was announced as a pandemic because of the highly significant increase in the number of cases outside of China. By then more than 118 000 cases had been reported in 114 countries, and 4291 deaths had been recorded and continued to scatter in different parts of the world [1]. The transmission route of COVID-19 which pass on between human and human.This could occur through direct , indirect , or close contact with infected people through infected secretions such as saliva and respiratory secretions or their respiratory droplets, which are expelled when an infected person coughs, sneezes, talks or sings.[2]

The main symptoms of COVID-19 were fever, dry cough, loss of taste or smell, fatigue, difficulty breathing. In order to control this Pandemic, almost every country around the World had a measure to control the spread of COVID-19 which included social isolating, wearing a mask indoor public place and public transportation, washing your hands often with soap or use alcohol gel , avoiding crowded and poorly ventilated space and getting vaccination as soon as possible.These measure decreased risk of getting infected of COVID-19.[3]

The current situation in Thailand, total number of COVID-19 cases was 1,637,432(3 Oct 2021) already recovered around 1,500,000 and total death was About 17,000. Moreover, the number of daily new cases remained the same at about 10,000-15,000 everyday. About 32 million people had now received a first vaccination dose, representing 63.3% of the Government target .More than 18 million people had received a second dose, representing 35.9% of the government target. More than 1 million third doses had also been administered.The relative proportion of all cases that were being reported in Bangkok remains high. In addition increases in case numbers were now being reported in Southern Provinces, with the 4th, 5th, 6th and 7th highest Provincial case counts for today being reported from Narathiwat (617 cases), Songkhla (566 cases), Yala (561 cases and Nakhon -Si Thammarat (458 cases). The reason for these increases were not currently very clear, with transmission likely occurring in both community and occupational settings. [4]

Due to the pandemic of COVID-19 which was the emerging disease which occured in december 2019. Currently, the total number of COVID-19 cases around the world was about 219 millions (3 oct 2021) COVID-19 had a negative effect in every aspect such as physical and mental health , economy , society and politics. Furthermore, medical personnel, medical and dental students were mostly at risk to get infected of COVID-19 because of the study and workplace field that lead to these people having to study or work close to the patient. Therefore, medical personnel and medical students should learn about Infection Prevention and Control (IPC) knowledge in order to prevent and decrease risk for themself and their family to be safe from COVID-19. The study aimed to identify the infection IPC knowledge, attitudes and practice among freshman year dental students in Songkhla, Thailand and to analyze the predictors of the adoption of those preventive behaviors.

2. METHODS

Participants and procedure

This was a cross-sectional observational study. An online questionnaire was purposely developed and made available through Google From between 01-Sep-2021 and 14-Sep-2021. All first year dental students were eligible and were invited to participate in the study. The invitation was sent to Social media groups of first year dental students. The students have access to the social media groups, so they all receive an invitation. In this invitation, information about the objectives of the study as well as the ethical guarantee of confidentiality and anonymity in the data collected as stated in the informed consent were explained. Participation was completely free and voluntary, and no personal data were collected from any participant. Of the 45 first year students, a total of 50 students participated in the study (response rate: 90 %).

Instrument

The questionnaire was developed based on a literature review including (1) Infection Prevention and Control in dental department , Standard precaution , dental health care personnel safety, background information about COVID-19,Symptoms of COVID-19 from WHO, CDC] (2) studies performed on the same topic were several common items were used to assess each of the dimensions analyzed in this study. The proposed items were then grouped and redundant items were removed. A preliminary version of the instrument was reviewed by three experts to validate its content. A pretest was then performed with a small sample of dental students to test for comprehension and difficulty. All the questions remained without modifications. The psychometric characteristics of the questionnaire were tested, as described in the statistical analysis subsection. The final version of the questionnaire contained 26 questions; 1 about sociodemographic date (gender) and 25 items divided into 3 sections.

Knowledge about IPC in Dental Department: this scale consisted of 15 questions related to IPC knowledge in Dental Department ,Standard precaution,Hand hygiene, personal protective Equipment,Sharps safety,Safe injection Practice, Sterilization and disinfection of patient-care Items and devices,Environmental infection prevention and control and COVID-19 screening. The participants were asked to choose the correct answer from multiple choices of 4. One point was assigned to each correct answer, while providing an incorrect answer received zero points. The sum of all items was made hence higher scores corresponded to a higher level of knowledge.

Attitude toward IPC : this scale was composed of 5 items, and response categories consisted of a five-point scale (from 1-strongly disagree, to 5 agree) with the highest score corresponding to more positive attitudes toward preventive behaviors.Some items on the scale were inverted for the analysis. A sum of all the items was made to obtain a score. The "Attitude toward IPC " factor consisted of 5 items and varied from 5 to 25 and the higher values corresponded to a more positive attitude toward IPC Practice.

Practice in IPC : this scale referred to the number of preventive behaviors adopted and included 5 items; Personal Protective Equipment, Physical distance, Disinfection of Patient care Items and devices and COVID-19 measures. The data analysis reports 5 items. Each item was answered using a five-point scale (From 1-Never to 5-Always), with one point assigned to each behavior that was always practiced. The number of behaviors practiced was added up. A high score on this scale indicated good preventive behaviors, ranging from 5 to 25.

Statistical analysis

The analysis was performed using SPSS for windows, version 26. To analyse psychometric characteristics of the scales, an exploratory factor analysis, using principal component analysis with varimax rotation, was carried out. Reliability was analyzed through the calculation of item-total correlation coefficients and Cronbach's alpha (α) for the scales of the questionnaire. The descriptive analysis were presented in absolute (n) and relative (%) frequencies, mean (M) and standard deviations (SD). To assess the differences between the outcome variables (Knowledge, attitudes and practice) and the sociodemographic characteristics, considering the sample size, independent t-test and the ANOVA were used as appropriate. The correlations between the outcomes of the study were calculated by Pearson's correlation. Lastly, a generalized linear model was calculated to determine the predictive variables of the preventive behaviors. Exp (β) and the respective 95% confidence intervals (95% IC) were presented. Statistical significance was defined as $p < 0.05$.

Ethical Approval.

Ethical approval was obtained from the study sites prior to data collection, and consent was assumed as completing the survey questions. Participants were informed that their participation was voluntary and that they could withdraw from the study at any point or choose not to answer any question. Participants 'confidentiality was maintained as no identifying information was collected and findings will be disseminated only in aggregate.

3. RESULT

This study comprised a total of 45 dental students. The sociodemographic characteristics of the sample are presented in Table 1. Most students were female (n=33,73.3%) .

Regarding knowledge about Infection Prevention and Control , students revealed moderate knowledge about Infection Prevention and Control ,correctly answering the mean of 9.18(SD = 2.27) questions in a total of 15 . Male students showed higher knowledge scores (M=9.50 , SD=2.88) than female students (M=9.06,SD=2.05)

Students showed a moderate level of attitude toward Infection Prevention and Control with the average score of 18.67 from 25 full scores.Female illustrated higher attitude toward Infection Prevention and Control scores (M=19.06 , SD=1.98) than male students (M=17.58 , SD= 2.94)

Concerning Practice in Infection Prevention and Control , students indicated a good level of practice in Infection Prevention and Control with a mean score of 22.91 in a total of 25. Female students had higher practise in Infection Prevention and Control (M=23.39 , SD=1.80) than male students (M=21.58 , SD=2.71) (Table 1.)

Table 1: Differences in outcomes according to the sociodemographic characteristics of participants (N = 45)

Sociodemographic characteristics	N (%)	Knowledge about IPC in dental department (Range 0-15) M (SD)	Attitude toward IPC (Range 5-25) M (SD)	Practice in IPC (Range 5-25) M (SD)
Gender				
Male	12 (26.7)	9.50 (2.88)	17.58 (2.94)	21.58 (2.71)
Female	33 (73.3)	9.06 (2.05)	19.06 (1.98)	23.39 (1.80)
Total	45 (100)	9.18 (2.27)	18.67 (2.34)	22.91 (2.20)

The analysis of the correlations between the outcomes of the study - knowledge , attitudes and IPC Practice - revealed no existence of positive or negative and statistically significant correlations between the variables related to Infection And Prevention practice. (Table 2.)

Table 2: Pearson's correlation coefficient between the study outcomes

Variables	Knowledge about IPC in dental department	Attitude toward IPC	Practice in IPC
Knowledge about Infection Prevention and Control in dental department	1		
Attitude toward Infection Prevention and Control	-.109	1	
Practice in Infection Prevention and Control	.076	-.024	1
**Correlation is Significant at the 0.01 *Correlation is Significant at the 0.05			

Results from the Generalized linear model indicated that gender (Beta = .413) was a predictive factor on IPC Practice adopted (Table 3).

Table 3: Generalized linear model predicting IPC Practice of Dental students.

	B	SE	EXP (β)	Sig (p)	95% CI Lower	95% CI Upper
Gender	2.033	.736	.413	.009	.547	3.519
Knowledge about Infection Prevention and Control in dental department	.095	.140	.098	.502	-.188	.377
Attitude toward Infection Prevention and Control	-.122	.141	-.130	.391	-.407	.163

4. DISCUSSION

This study presented a knowledge, attitude and practice among Songkhla dental students that are enrolled in freshman year in dental school toward infection prevention and control. The infectious disease was one of the most factors likely to affect medical, dental students. Knowledge, attitude and practice about IPC is important for all medical and dental students. The result regarding the knowledge about IPC revealed a moderate understanding because of the year level in the dental department. Freshman year was in Pre-clinic so it was less risky than a clinic year that had to work with the real patient. The question that was most correctly answered " How important is Personal Protective Equipment in the workplace?" ;94.6% and "Which of the following is the right procedure of standard precaution?"; 91.1%. While the least correctly answered items were "In case that the patient has a dry cough, sore throat and high fever what should the dental personnel do?"; 23.2% and "Which supplementary measures are measures to reduce the number of pathogens and aerosol content?"; 28.6%. This could be attributed from the question that most participants answered correctly were in basic knowledge, on the other hand the question that most participants answered incorrectly were in the complex and complicated knowledge about IPC. Freshman year in dental school was not studying about knowledge about IPC and not attending the medical workshop. No years of experience in medical workshops show higher preventive behavior and practice according to the study in Saudi Arabia.[5] Therefore, the higher level of year in medical platform and years of experience in the medical field were likely to be associated with the higher performance ,practice and attitude toward in IPC.

According to the attitude toward IPC Students showed a moderate level of Attitude toward IPC. The question item that most agreed answers were "The spread of various pandemic affects dental services"; 67.86% and " medical personnel are having higher chance to get the infection than other profession";60.71%.While the least agreed answers were "Should not

provide dental services during the pandemic";14.23% and " Social distancing is a difficult measure to implement"; 14.23%. Participants understood the harmful effect of the spread of the pandemic. However, they were not likely to agree that the dental clinic should not provide the treatment and service during the pandemic.Nevertheless, medical personnel must protect and carefully aware of the negative consequences from the pandemic so that medical personnel should follow the standard precaution measure and know about Infection Prevention and Control in medical platform. This is because the freshman year of dental students did not interact with actual patients.

Therefore, this is the reason why attitude toward IPC was at a moderate level. During the study period the schools and universities were under lockdown measure, all students studied online from their homes. This could lead to students feeling less aware of the harmful effect of COVID-19 infection and not realize the vital prevention in COVID-19 because they are less likely to intimidate with other people.[6]

However, the practice in IPC was at a good level . The rationale behind this was that students were in the severe of the outbreak of COVID-19 so they had to follow the COVID-19 measure which the government announced measures and precautions regarding the outbreak of the COVID-19. Moreover, students may be informed about the vital healthcare practice against COVID-19 from the social media such as news about the new cases of infected COVID-19, the method to take care of yourself from getting infection such as hand hygiene, social isolation ,vaccination and increase the herd immunity, the newest variant of COVID-19; alpha plus that can cause more trammissionable to other people [7]. Moreover , participants were in the health science field so they should be more aware of IPC than the general public. Therefore, all of the reasons that can contribute to the good level of practice in IPC.

From the Generalized Linear Model predicting IPC Practice of Dental students found that gender had significant effects on IPC practice adoption. This study comprised a total of 45 dental students . 33 were females and 12 were males. According to the study, males were more knowledgeable about IPC than females. On the other hand, Part of Attitude and Practice in IPC women were more likely to have a higher Attitude and Practice in IPC than men which was similar to that found in other studies in Jordan [8] that female tended to be more vulnerable to develop the symptoms of various forms of mental disorders during pandemic than males such as depression, anxiety and stress.Therefore, females were likely to concern and aware of the negative consequence from pandemic of COVID-19 much more than male which lead to the higher attitude and practice toward IPC.

Limitation

Based on the survey, we collected data from an online form. The respondents might be able to find out the information and answer from the internet while they did a survey. The respondents got a lesser chance of interacting in public during the COVID-19 therefore affected their level of risk perception. This study was from only one dental faculty which could not be representative of all freshman dental students in Thailand.

5. CONCLUSIONS

From 45 participants,12 (26.7%) were male and 33 (73.3%) were female . All participants were in their freshman year of dental school. The study revealed that freshman dental students had a moderate level of IPC knowledge and attitude toward IPC. However, IPC practice was at a good level. From The Generalized Linear Model predicting IPC Practice of Dental students found that gender was a predictor of IPC practice adoption.

REFERENCES

[1] World Health Organization, Europe. Coronavirus disease (COVID-19) pandemic. Cited on 2021 Sep 01. Available from: https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov#:~:text=Coronaviruses%20(CoV)%20are,previously%20identified%20in%20humans.

[2] World Health Organization, Europe. Coronavirus disease (COVID-19): How is it transmitted?. Cited on 2021 Sep 01. Available from: https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted

[3] Center for Disease Control and Prevention, United state of America. Symptoms of COVID-19 .Cited on 2021 Sep 01. Available from: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

[4] Relife web,United nations. Coronavirus disease 2019 (COVID-19) WHO Thailand Situation Report 203 - 30 September 2021.Cited on 2021 oct 03 . Available from: https://reliefweb.int/report/thailand/coronavirus-disease-2019-covid-19-who-thailand-situation-report-203-30-september

[5] Shubayr MA, Mashyakhy M , Al Agili DE , Albar N and Quadri MF. Factors Associated with Infection-Control Behavior of Dental Health–Care Workers During the COVID-19 Pandemic: A Cross-Sectional Study Applying the Theory of Planned Behavior. Dovepress,12 November 2020 Volume 2020:13 Pages 1527—1535. DOI https://doi.org/10.2147/JMDH.S278078. Available from: https://www.dovepress.com/factors-associated-with-infection-control-behavior-of-dental-healthnda-peer-reviewed-fulltext-article-JMDH

[6] Bangkokpost, Thailand. School closures 'affecting development'.Cited on 2021 Oct 04. Available from:(https://www.bangkokpost.com/thailand/general/2171387/school-closures-affecting-development

[7] British Broadcasting corporation, United kingdom. delta plus Covid variant may be more transmissible.Cited on 2021 Oct 04. Available (https://www.bbc.com/news/health-59009293)

[8] JiaqiXiong, OrlyLipsitz, FloraNasri, Leanna M.W.Lui, HartejGill, LeePhan, DavidChen-Li, MichelleIacobucci, RogerHo, Amna Majeed and Roger S.McIntyre. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. Journal of affective disorders,Volume 277, 1 December 2020, Pages 55-64,DOI https://doi.org/10.1016/j.jad.2020.08.001.Available from:(https://www.sciencedirect.com/science/article/pii/S0165032720325891?via%3Dihub)