

CHI-SQUARE ANALYSIS ON THE EFFECT OF PREVENTIVE MEASURES TO CONTROL COVID-19 PANDEMIC IN INSTITUTIONS.

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Abstract

Educational institutions promptly implemented set of steps as a preventive measures to stop the spread of COVID-19 amongst Kogi state students, such as restrictive physical exercise popularly known as “social distancing”, putting on mask , daily health reporting , washing your hand with soap and water and the use of hand sanitizer. Success of these behavioral changes comparing largely depends on awareness of the targeted population. The aim of this study is to evaluate the most effective measures taken by individual to control the spread of the covid-19 pandemic in Kogi State using Chi-Square method .We conducted a survey using questionnaire among 500 students from two tertiary institutions in kogi state, 200 students from Kogi State Polytechnic and 300 students from Federal University Lokoja in Kogi state and only 200 questionnaires were successfully collected from the institutions. The questionnaires were focused on preventive measure taken mostly by students. The result show that the leading respondents were within 17 to 46 years age group. The preventive and supportive measures taken by students or provided by the respective institutions or authorities were positively related to students satisfaction and had an acceptable strength($\chi^2 > 9.488$, $df=2, p \geq 0.05$). From the result received we noticed that most students in Kogi state, Lokoja take measures in the wearing nose masks, washing hands with soap and water, sanitizing hand after washing but students are not complying with social distancing and hand sanitizing after school hours. Moreover Health education training must be organized to improve COVID- 19 awareness.

KEYWORDS: Chi-Square,Covid-19,Pandemic,Measures,Analysis,Preventive,Symptomatic

1. INTRODUCTION

Coronavirus belong to families of viruses that are well known in the community. Historical perspective have shown that the virus is a zoonotic disease transmitted through birds and mammals, with humans susceptible to infection and transmission of the virus (Hui DS, IA E, Madani TA, Ntoumi F, Kock R, Dar O, Ippolito G, TD MH, Memish ZA, Drosten C, et al, 2020;). The virus is caused by SARS-CoV-2 with typical symptoms of fever, dry cough, and tiredness. On average, the incubation period is 5–6 days from the time someone is infected with the virus to the onset of symptoms, with a maximum of 14 days. Nucleic acid detection and genome sequencing have commonly been conducted with pharyngeal swabs, sputum, alveolar lavage fluid, feces, and other samples from patients to detect SARS-CoV-2 . It has been reported that COVID-19 can be transmitted person-to person, with the main transmission methods being either by air or contact (Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR., 2020;). Therefore, persons can be infected by inhaling droplets or aerosols containing the etiologic agent SARS-CoV-2 that are exhaled by someone with the infection, or by contacting virus contaminated items. According to (Zhao Qinglong, Wang Yao, Yang Meng, Meina Li, Zeyu Zhao, Xinrong Lu, Bo Shen, Bo Luan, Yifei Zhao, Bonan Cao, Laishun Yao, Benhua Zhao, Yanhua Su and Tianmu Chen, 2021) said that Coronavirus disease 2019 (“COVID-19”) is an emerging respiratory disease caused by a novel coronavirus initially called 2019-nCoV but subsequently renamed Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV). SARS-CoV-2 is a new strain discovered in 2019, seems to have originated from bats with cases first reported from Wuhan, Hubei Province in China, suggesting an animal to- person spread in a live animal market. The virus has since then spread beyond Hubei to therest of the world via human transmission. Several countries including Nigeria have now reported community spread. Because of its wide spread across countries, the COVID-19 was declared as a pandemic by World Health Organization (WHO) on March 11, 2020 . The disease which is highly infectious is characterized with the following main clinical symptoms: fever, dry cough, fatigue, myalgia, and dyspnea. (WHO. WHO Director-General’s opening remarks at the mission briefing on COVID-19., 2020.)

To prevent further spread of the virus, civil societies and government agencies embarked on enlightenment campaigns for good hygiene and social distancing. Temperature screening was conducted at airports and those returning from countries with numerous confirmed cases of COVID-19 were implored to self-isolate. The NCDC in association with State governments also

began tracing and tracking of possible victims and their contacts. On March 18, 2020, the Lagos State government suspended all gatherings above fifty people for four weeks and ordered all lower and middle level public officers to stay-at-home (Ewodage, 2020). Similarly, the Federal government, on March 30, 2020 introduced various containment strategies such as closing of the national borders and airspace, schools, worship centers and other public places, cancelling of mass gathering events and placing the Federal Capital Territory, Lagos and Ogun states on lock down for an initial period of fourteen days (Radio Nigeria, 2020). Covid-19 testing laboratories were set up in Lagos, Abuja and Irrua in Edo State while State governments opened isolation centres and imposed dawn to dusk curfews in their territories. COVID-19, from the family of Coronavirus (others include SARS, H5N1, H1N1 and MERS), is a contagious respiratory illness transmitted through the eyes, nose, and mouth, via droplets from coughs and sneezes, close contact with infected person and contaminated surfaces. It has an incubation period of approximately one to fourteen days. The symptoms include cough, fever and shortness of breath, and it is diagnosed through a laboratory test. The contagion could lead to severe respiratory problems or death, particularly among the elderly and persons with underlying chronic illnesses. Some infected persons however, are carriers of the virus with no symptoms while others may experience only a mild illness and recover easily (Sauer, L. M., 2020). The elderly and those with underlying chronic diseases are at higher risk of increased severity. It was reported in China that 18.5% of the patients with COVID-19 develop to the severe stage, which is characterized by acute respiratory distress syndrome, septic shock, difficult-to-tackle metabolic acidosis, bleeding and coagulation dysfunction (Dong N, Yang X, Ye L, Chen K, Chan EW-C, Yang M, Chen S., 2020;). According to European Centre for Disease Prevention and control, as of 16 April 2020, 2 029 930 cases of COVID-19 (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including 136 320 deaths worldwide while in Africa there are 17 243 cases reported with five countries reporting most cases: South Africa (2 506), Egypt (2 505), Algeria (2 160), Morocco (2 024) and Cameroon (855) with 911 deaths; the five countries reporting most deaths are Algeria (336), Egypt (183), Morocco (127), Tunisia (35) and South Africa (34) (Ibrahim, Rabi, Kabir, Zubair Ovavi, Yahaya, Isah Adagiri, Itopa, Ododo Benard, Yakubu, Abdulsalam, Abdullahi, Ajayi Onimisi, 2021). In Nigeria, the first case was reported on the 27th February 2020 and as at 16th April, 2020, 442 confirmed cases have been reported in 20 states with 13 deaths (Nigeria Centre for Disease Control, An update of COVID-19 outbreak in Nigeria.). Currently there is specific antiviral treatment and preventive

vaccine. There are guidelines recommended to decline the spread of infection and respond to the challenges during the epidemic. CDC recommended that coronavirus spreads mainly from person-to-person by close contact (within about 6 feet) with infected people via respiratory (coughs or sneezes) or transmitted by touching a surface or object that the virus on it . The best prevention is to avoid being exposed to COVID-19. This is done by washing hands with soap and water, and using face masks, isolating confirmed and suspected cases of the spreading, people's adherence to these control measures are important and this depend largely on their health knowledge and attitudes, and preventive practices (KAP) towards infection by Severe Respiratory Syndrome-Cov-2 in accordance with KAP theory . A study has shown that SARS outbreak in 2003 suggest that knowledge and attitudes towards infectious diseases are associated with level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease . To facilitate the management of COVID-19 in Nigeria, there is an urgent need to understand the public's awareness of the disease.

2. STATEMENT OF THE PROBLEM

Lokoja residents do not take precaution during this COVID-19 pandemic which can lead to spread of COVID-19 disease in Lokoja. This lead us to focus our research on the students in Lokoja to analyze the extent to which students comply to the preventive measures prescribed by WHO.

3. AIM AND OBJECTIVES

The aim of this research paper is to use chi-square modeling to evaluate the effect of preventive measures to control covid-19 pandemic in the institutions in Lokoja.

The objectives are:

1. to review a related work,
2. to determine the number of students that are taken precaution against the COVID-19 pandemic,
- 3.to help authorities to organize the necessary health educational programs and trainings in order to provide up-to-date information and deliver the best practice to control the COVID-19 disease in Lokoja.

4. LIMITATIONS

One of the drawbacks of this study was the limited sample representativeness. Due to limited access to internet and online health information resources, vulnerable population of Lokoja under this COVID-

19 pandemic were not like reached and this research is limited to the higher institution students in Lokoja.

5. LITERATURE REVIEW

According to Covid-19 guidance for schools in Nigeri a by NCDC reported that in 2019 coronavirus disease (COVID-19) is caused by a new strain of coronaviruses that has not been previously identified in humans. It was first detected on the 7th of January, 2020 in Wuhan, China. Some coronaviruses can be transmitted from person to person, usually after close contact with an infected patient, for example, in a household or healthcare .most initial transmission appeared to be zoonotic, personto-person transmission is the most common mode of transmission currently.

5.1.WHAT ARE THE SYMPTOMS OF COVID-19?

The incubation period of COVID-19 is between 2 and 14 days. This is the time between when a person gets infected and when they start showing symptoms. If a person remains well 14 days after contact with someone with confirmed COVID-19, it is unlikely that they have been infected. The following symptoms may develop in the 14 days after exposure to someone who has COVID19 infection: □ cough □ shortness of breath or difficulty in breathing □ fever □ muscle pain Generally, these infections can cause more severe symptoms in people with weak immune systems, older people, and those with long-term conditions like diabetes, cancer and chronic lung disease. There is no evidence that children are more affected than other age groups few cases have been reported in children.

5.1.1 HOW IS COVID-19 SPREAD?

The spread of COVID-19 is most likely to happen when there is close contact (within 2 metres) with an infected person. The risk increases the longer someone has close contact with an infected person. Droplets produced when an infected person coughs or sneezes (respiratory secretions) containing the virus are most likely to be the most common means of transmission. There are two routes by which people could become infected: Secretions can be directly transferred into the mouths or noses of people who are nearby (within 2 metres) or could be inhaled into the lung. It is also possible that someone may become infected by touching a surface or object that has been contaminated with respiratory secretions (such as touching a doorknob or shaking hands with an infected) and then touching their own mouth, nose or eyes. COVID-19 is spread only by people who have been exposed to the virus. People do not get sick with Covid 19 based on their Nationality or any other characteristic.

5.1.2 HOW CAN YOU PREVENT THE SPREAD OF COVID-19?

The best way to prevent infection and spread of COVID-19 is to avoid being exposed to the virus by following basic hand and respiratory hygiene measures. The NCDC recommends that schools and other learning institutions take the following measures:

1. Ensure that students and staff wash their hands often; it is advised that the teachers supervise younger children.
2. Ensure that an alcohol-based sanitizer is made available at all entrances to the school.
3. Students and teachers should cover their mouth and nose with tissue when coughing or sneezing. Throw the used tissue away into a closed bin and wash your hands. If you don't have a tissue, cough or sneeze into your flexed (bent) elbow. Have tissues available. A demonstration should also be done on how to sneeze into their elbow if no tissue is available. Students and teachers who feel unwell should stay at home and should not attend school or any educational or public setting.
4. Students, staff and visitors should wash their hands before leaving home , on arrival at school or after using the toilet or after breaks and sporting activities or before preparing food or before eating any food, including snacks and before leaving school
5. Avoid touching eyes, nose, and mouth with unwashed hands
6. Avoid close contact with people who are unwell
7. Schools should clean and disinfect frequently touched objects and surfaces
8. Limit the number of visitors to your school; parents, care-givers and drivers should drop students off at the school entrance. The only items you need in order to prevent the spread of COVID-19 are your usual household goods: soap, water, hand sanitizer, tissues, and everyday cleaning items. There are medications or solutions you can take to prevent COVID-19.

5.1.3 WHAT TO DO IF STUDENTS OR STAFF BECOME UNWELL AND SHOW SYMPTOMS OR BELIEVE THEY HAVE BEEN EXPOSED TO COVID-19 (EITHER THROUGH TRAVEL TO A COUNTRY WITH CONFIRMED CASES OR ONGOING COMMUNITY TRANSMISSION)

People who within 14 days before the onset of illness have returned from to any country with confirmed or ongoing community transmission should contact NCDC immediately on 0800 9700 0010

and self-isolate (stay at home for 14 days on returning from one of these countries, before returning to school). Do not attend classes or an educational setting until after 14 days of return. This measure will help protect your household and your local community. If a student becomes unwell, they should be taken to the school clinic/medical officer and a parent contacted. If they have a travel history to a country with confirmed cases or ongoing community transmission, proper procedures should be followed, notifying NCDC for further guidance. If a staff member becomes unwell in the facility and they have a travel history to a country with confirmed or ongoing community transmission of COVID-19, the individual should be kept in a room on his/her own, and NCDC notified. Whilst you wait for advice from NCDC, ensure the student or staff member is isolated in a separate room, behind shut doors, reducing contact with other people. Keep the room they are in well ventilated. If they need to go to the bathroom whilst waiting for medical assistance, they should use a separate bathroom if available. Make sure that students know to tell a member of staff if they feel unwell.

5.1.4. WHAT TO DO IF A CASE OF COVID-19 (STUDENT OR STAFF) IS SUSPECTED IN YOUR SCHOOL

If anyone has been in contact with a suspect case in a school, they should contact NCDC on 0800 9700 0010. While laboratory test results for COVID-19 are awaited, there is no need to close the facility or send students or staff home. Until the outcome of test results is known there is no action that staff members need to take apart from ensuring basic hygiene advice is followed and school premises are kept clean and waste is disposed of. Once the results arrive, where tests are negative for COVID-19, parents will be advised and return to school classes as normal.

5.1.5. WHAT TO DO IF A CASE OF COVID-19 (STUDENT OR STAFF) IS CONFIRMED IN YOUR SCHOOL NCDC

The school should be contacted to discuss the case, identify people who had been in contact with the student or staff member, and advise on actions or precautions that should be taken. Appropriate measures to isolate and identify other contacts will be advised. NCDC will be in touch with any contacts of the patient to provide them with appropriate advice. Advice on cleaning of communal areas such as classrooms, changing rooms and toilets will be given by NCDC. If there is a confirmed case, a risk assessment will be undertaken by the school with advice from NCDC. Closure of the educational setting will be advised based on the findings of the risk assessment.

5.1.6. WHAT TO DO IF STUDENTS OR STAFF IN YOUR INSTITUTION ARE CONTACTS OF A CONFIRMED CASE OF COVID-19 WHO WAS SYMPTOMATIC WHILE ATTENDING YOUR SCHOOL

The definition of a contact includes: any student or staff member in close face-to-face or touching contact including those undertaking small group work (within 2 metres of the case for more than 15 minutes) talking with or being coughed on for any length of time while the individual is symptomatic anyone who has cleaned up any of the bodily fluids of the individual close friendship groups any student or staff member living in the same household as a confirmed case, or equivalent setting such as boarding school dormitory or other student accommodation Contacts are not considered cases and if they are well, they are very unlikely to have spread the infection to others, however:

1. they should be asked to self-isolate at home, or within their boarding school dormitory room, for 14 days from the last time they had contact with the confirmed case
2. they will be actively followed up by NCDC
3. if they develop any symptoms within their 14-day observation period they should contact NCDC on 0800 9700 0010
4. if they become unwell with cough, fever or shortness of breath they will be tested for COVID19
5. if they are unwell at any time within their 14-day observation period and they test positive for COVID-19, they will become a confirmed case and will be treated for the infection Family and friends who have not had close contact (as listed above) with the original confirmed case do not need to take any precautions or make any changes to their own activities such as limiting attendance at school or work, unless they become unwell.
6. If a confirmed case occurs in a school, NCDC will provide further advice and will work with the head teacher, principal and or proprietor for further guidance. Outside those that are defined as close contacts, the rest of the school does not need to take any precautions, apart from basic hand and respiratory hygiene practices. No further changes to activities linked with attending school or work as usual, unless they become unwell, will be necessary.

5.1.7. WHERE DO I GET ACCURATE INFORMATION FROM? Be aware that media speculation is common about COVID-19 and not everything you read in the newspapers or online, or hear is accurate or verified. Trusted and accurate information will always be released by the Federal Ministry of Health or the Nigeria Centre for Disease Control. You can find the latest information and advice by contacting NCDC on:

1. NCDC Toll-free Number: 0800-97000010
2. SMS: 08099555577
3. WhatsApp: 07087110839
4. Website for additional resources: www.ncdc.gov.ng
5. Twitter and Facebook: @NCDCgov After self-isolation and there are no symptoms, individuals can return to work, school and everyday activities. Tests are not necessary and should only be done in the case where the individual has symptoms and meets the case definition.

5.2 REVIEW OF A RELATED WORK

(Ibrahim, Rabi, Kabir, Zubair, Ovavi, Yahaya, Isah, Adagiri, Itopa, Ododo, Benard, Yakubu, Abdulsalam, Abdullahi, Ajayi Onimisi, 2021) worked on Knowledge Attitude and Preventive Practices towards Infection by Severe Respiratory Syndrome-CoV-2 among Residents of Kogi State during the COVID-19. The Researchers said that Pandemic Global spread of the Severe Acute Respiratory Syndrome-CoV-2 (SARS-CoV-2) responsible for the COVID-19 pandemic constitute a public health threat requiring strict infection prevention practice for every individual in the community. Control measures have been prescribed to check the rapid spread of the COVID-19 pandemic in Nigeria. Whether populations in these communities adhere optimally to these control measures depends on a number of factors. This study aimed to assess health knowledge and attitude, and preventive practices regarding Infection by SARS-Cov-2 among residents of Kogi State during the COVID-19 Pandemic. A cross-sectional study was conducted among residents of Kogi State. Using the authors' internal connections with the Kogi residents, 865 residents were recruited into the study via simple random sampling method. The data were collected by an online questionnaire designed by Google form which was adapted from a study in China. The data were analyzed using SPSS version 23 at various levels with p value at < 0.05 . Among 865 questionnaires sent out, 639 were filled completely and returned given a respondent rate of 73.9%. Of the 12 questions on knowledge, the mean overall correct answers was 9.9 given overall correct rate of the participants' knowledge of 82.5%. 88.4% of the respondents had confidence that Nigeria can win the battle against COVID-19. Just about 52.6% of the participants wore masks when going out in recent days. In multiple binary logistic regression analyses, there was significant statistical association between the COVID-19 knowledge score, and a lower likelihood of negative attitudes (OR: 0.87-3.98, $P < 0.001$) and preventive practices towards COVID-19 (OR: 0.53-0.67, $P < 0.001$). Health education training to

improving COVID-19 knowledge is needed for Kogi residents to have optimistic attitudes and maintain appropriate preventive practices.

(Zhao Qinglong, Wang Yao, Yang Meng, Meina Li, Zeyu Zhao, Xinrong Lu, Bo Shen, Bo Luan, Yifei Zhao, Bonan Cao, Laishun Yao, Benhua Zhao, Yanhua Su and Tianmu Chen, 2021) *proposed on* Evaluating the effectiveness of measures to control the novel coronavirus disease 2019 in Jilin Province, China. They said based on differences in populations and prevention and control measures, the spread of new coronary pneumonia in different countries and regions also differs. This study aimed to calculate the transmissibility of coronavirus disease 2019 (COVID-19), and to evaluate the effectiveness of measures to control the disease in Jilin Province, China. The data of reported COVID-19 cases were collected, including imported and local cases from Jilin Province as of March 14, 2019. A Susceptible–Exposed–Infectious–Asymptomatic–Recovered/Removed (SEIAR) model was developed to fit the data, and the effective reproduction number (R_{eff}) was calculated at different stages in the province. Finally, the effectiveness of the measures was assessed. A total of 97 COVID-19 infections were reported in Jilin Province, among which 45 were imported infections (including one asymptomatic infection) and 52 were local infections (including three asymptomatic infections). The model fit the reported data well ($R^2 = 0.593$, $P < 0.001$). The R_{eff} of COVID-19 before and after February 1, 2020 was 1.64 and 0.05, respectively. Without the intervention taken on February 1, 2020, the predicted cases would have reached a peak of 177,011 on October 22, 2020 (284 days from the first case). The projected number of cases until the end of the outbreak (on October 9, 2021) would have been 17,129,367, with a total attack rate of 63.66%. Based on the comparison between the predicted incidence of the model and the actual incidence, the comprehensive intervention measures implemented in Jilin Province on February 1 reduced the incidence of cases by 99.99%. Therefore, according to the current measures and implementation efforts, Jilin Province can achieve good control of the virus's spread. COVID-19 has a moderate transmissibility in Jilin Province, China. The interventions implemented in the province had proven effective; increasing social distancing and a rapid response by the prevention and control system will help control the spread of the disease.

(Tanwne Sarker, Apurbo Sarker, Md. Ghulam Rabbany, Milon Barmon, Rana Roy, Md. Ashfikur Rahman, Kh. Zulfikar Hossain, Fazlul Hoque and Muhammad Asaduzzaman, 2021) worked on

Evaluation of preventive, supportive and awareness building measures among international students in China in response to COVID-19: a structural equation modeling approach .Education institutions promptly implemented a set of steps to prevent the spread of COVID-19 among international Chinese students, such as restrictive physical exercise, mask wear, daily health reporting, etc. Success of such behavioral change campaigns largely depends on awareness building, satisfaction and trust on the authorities. The purpose of this current study is to assess the preventive, supportive and awareness-building steps taken during the COVID-19 pandemic for international students in China, that will be useful for planning such a behavioral change campaign in the potential pandemic situation in other parts of the world. We conducted an online-based e-questionnaire survey among 467 international students in China through WeChat. The data collection duration was from February 20, 2020 to March 10, 2020 and we focused on their level of awareness, satisfaction, and trust in authorities regarding pandemic measures. Simple bivariate statistics was used to describe the background characteristics of the respondents along with adoption of the partial least squares-structural equation modeling (PLS-SEM) as the final model to demonstrate the relationship between the variables. In their study, the leading group of the respondents were within 31 to 35 years' age group (39.82%), male (61.88%), living single (58.24%) and doctoral level students (39.8%). The preventive and supportive measures taken by students and/or provided by the respective institution or authorities were positively related to students' satisfaction and had an acceptable strength ($\beta = 0.611$, $t = 9.679$, $p < 0.001$). The trust gained in authorities also showed an acceptable strength ($\beta = 0.381$, $t = 5.653$, $p < 0.001$) with a positive direction. Again, the personnel awareness building related to both students' satisfaction ($\beta = 0.295$, $t = 2.719$, $p < 0.001$) and trust gain ($\beta = 0.131$, $t = 1.986$, $p < 0.05$) in authorities had a positive and acceptable intensity. Therefore, our study clearly demonstrates the great impact of preventive and supportive measures in the development of students' satisfaction ($R^2 = 0.507$ indicating moderate relationship). The satisfied students possessed a strong influence which eventually helped in building sufficient trust on their institutions ($R^2 = 0.797$ indicating above substantial relationship). The worldwide student group is one of the most affected and vulnerable communities in this situation. So, there is a profound ground of research on how different states or authorities handle such situation. In this study, we have depicted the types and magnitude of care taken by Chinese government and educational institutions towards international students to relieve the panic of pandemic situation. Further research and such initiatives should be taken in to consideration for future emerging conditions.

6. METHODOLOGY AND RESULT

The data were collected by a questionnaire distributed to the students on the campus. The data were analysed using Chi Square Method at various levels with p value at ≥ 0.05 .

Table1a: Student Response on Wearing Masks (Table of Observed Values)

Student Response	Always	Not Often	Not At All	Total
<i>A</i>	40	50	10	100
<i>B</i>	55	15	30	100
<i>Total</i>	95	65	40	200

Where A is Kogi State Polytechnic Students and B is Federal University Lokoja Students.

Null Hypothesis: There is no relation between the students and student response on preventive measures. There is no effect of wearing masks on the spread COVID-19.

Alternative Hypothesis: There is significant relation between the students and student response on preventive measures. There is effect of not wearing masks on the spread COVID-19.

Significance Level (α)=0.05

Expected Value= (Total Col* Total Row)/200

Significant Level (α)=0.05

$$x^2 = \frac{(Observed\ value - Expected\ value)^2}{Expected\ Value}$$

Table1b: Calculation of Expected Values and chi square (χ^2)

Observed Value (O)	Expected Value (E)	O-E	(O-E)²	$\frac{(o-\varepsilon)^2}{\varepsilon}$
40	47.5	-7.5	56.25	1.18421053
50	32.5	17.5	306.25	9.42307692
10	20	-10	100	5.0

55	47.5	7.5	56.25	1.18421052
15	32.5	17.5	306.25	9.42307692
30	20	10	100	5.0
Total(X^2)				31.21457489

$$X^2 = 31.21457489$$

$$X^2_{\text{tabular}} = 30.10$$

$$X^2_{\text{calculate}} = 31.21$$

$$X^2_{\text{calculate}} > \chi^2_{\text{tabulated}}$$

The degree of 31.21 freedom = (r-1)(c-1)

$$(2-1)(3-1)$$

$$(1)(2) = 2$$

$$df = 2.$$

The degree of freedom (df) = 2. The X^2 value of 31.21 is significant at all levels beyond 0.001.

Therefore we reject Null Hypothesis, and accept Alternative hypothesis

Alternative Hypothesis: There is significant relation between the students and student response on wearing mask to control the spread of COVID -19

Conclusion: $X^2_{\text{calculate}} > \chi^2_{\text{tabulated}}$

The students wearing mask in the higher institution in lokoja is high therefore there is effect of wearing masks to control the spread of COVID-19.

Table2a: Students Response on washing Hands with soap and Water

Student Response on Washing of Hands	Always	Not often	Not at all	Total
A	32	30	38	100

Table2b: Calculation of Expected Values and chi square

Table2b: Calculation of Expected Values and Chi-Square.

O	ε	(O-ε)	(O-ε) ²	$\frac{(o-\epsilon)^2}{\epsilon}$
32	45	13	169	3.75555555
30	25	5	25	1
38	30	8	64	2.13333333
58	45	13	169	3.75555555
20	25	-5	25	1
22	30	-8	64	2.13333333
Total(X ²)				13.7777778

$X^2_c = 13.78$

$X^2_t = 10.827$ the x^2 value of 13.78 is significant at all levels beyond 0.001 the result indicate that student performance on washing of hands in Lokoja is very high

H₀: There is no effect of washing hands on the control of spread COVID-19 among students.

H₁: there is effect of washing hands on the control of COVID-19 among student.

$X^2_c > X^2_t$ Therefore there is effect of washing hands on the control of COVID-19 among students.

Table3a: Students Response on hand sanitizing after washing

Student Response on Sanitize after hands washing	Always	Not often	Not at all	Total
Kogi State Polytechnic	40	20	40	100
Full	30	40	30	100
Total column	70	60	70	200

Table3b: Calculation of Expected Values and chi square

O	E	(O-E)	(O-E)²	$\frac{(o - \epsilon)^2}{\epsilon}$
40	35	5	25	3.7142857
20	30	-10	100	3.3333333
40	35	5	25	0.7142857
30	35	-5	25	0.7142857
40	30	10	100	3.3333333
30	35	-5	25	0.71428571
Total(X ²)				9.52380941

$X^2 = 9.5238$

$df = 2$

$X^2_c > X^2_t$

Therefore we reject Null Hypothesis, and accept Alternative hypothesis

Alternative Hypothesis: There is significant relation between the students and student response on hand Sanitize.

Sanitize hand after washing is significant at all levels beyond 0.01 sanitize hand after which means the performance of washing of hands among students is high in Kogi State.

H_0 : There is no effect of Sanitize hand after washing on the control of spread COVID-19 among students.

H_1 : there is effect of Sanitize hand after washing on the control of COVID-19 among student.

$X^2_c > X^2_t$ Therefore there is effect of Sanitize hand after washing hands on the control of COVID-19 among students.

Table 4a: Students Response on social distance

Student Response on social distance	Always	Not often	Not at all	Total row
A	49	36	15	100
B	42	42	16	100
Total column	91	78	31	200

Table4b: Calculation of Expected Values and chi square

O	ε	(O-ε)	(O-ε)²	$\frac{(o-\epsilon)^2}{\epsilon}$
49	45.5	3.5	12.25	0.269230769
36	39	-3	9.0	0.230769230769
15	15.5	-0.5	0.25	0.016129032258
42	45.5	-3.5	12.25	0.269230769
42	59	3.0	9.0	0.230769230769
16	15.5	0.5	0.25	0.016129032258
Total(X^2)				1.032258064

$$X^2 = 1.03$$

$X^2 < 7.815$ Therefore null hypothesis uphold means that the social distance is not obey in the higher institution in Lokoja.

Table5a: Students Response in Sanitize hand after day class or work

Student Response in Sanitize hand after day class or work	Always	Not often	Not at all	Total
A	48	32	20	100
B	54	36	10	100
Total column	102	68	30	200

Table5b: Calculation of Expected Values

and chi square

O	E	(O-E)	(O-E)²	$\frac{(o-\varepsilon)^2}{\varepsilon}$
48	51	13	9	0.176470588
32	34	-2	4	0.1176470588
20	15	5	25	1.666666666
54	51	3	9	0.176470588
36	34	2	4	0.1176470588
10	15	-5	25	1.666666666
Total(X ²)				3.9215686263

$X^2 = 3.92 < 0.05$ null hypothesis uphold means that sanitize their hand after school work is not obey by the higher institution students in Lokoja.

A graph shown the responses of the students towards the preventive measure against CoVID-19 pandemic.

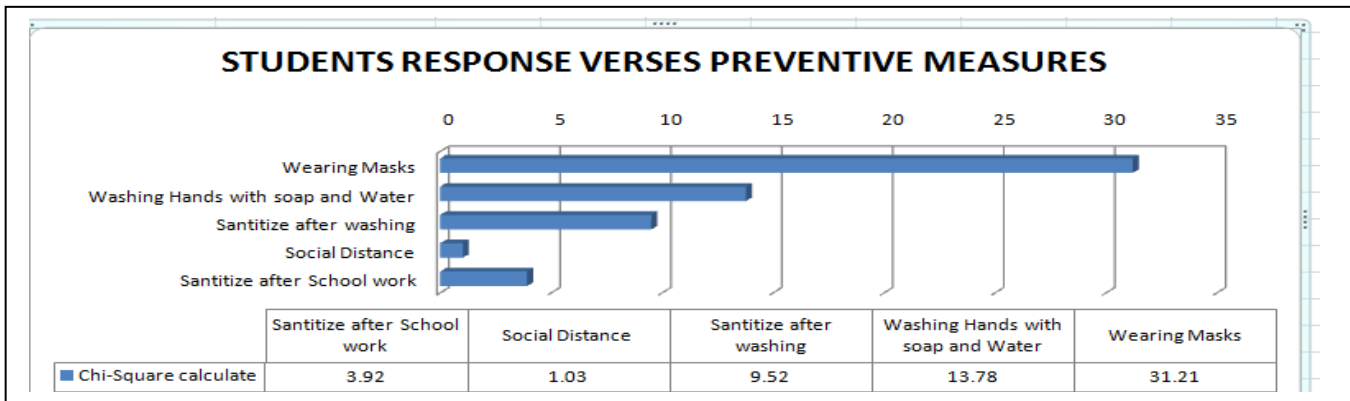


Figure 1:Graph showing the analysis of the effective measures taken by individual to control the spread of the covid-19 pandemic in Kogi State

7. DISCUSSION OF THE RESULTS

From Table 1 to Table 3 the calculated value ($X^2_{calculated}$) is greater than tabulated value($\chi^2_{tabulated}$) which means that null hypothesis(H_0) will be rejected and Alternative hypothesis (H_1) will be accepted that wearing of masks, washing hands with soap and water are obey by few students while social distance and sanitize hands after schools hour are not strictly obey because the calculated value($X^2_{calculated}$) is less than the tabulated value($\chi^2_{tabulated}$).

8. CONCLUSION

The findings shows us that the students are not strictly obey the prevent measure by the educational institution authority so there is a need for the authorities to organize the necessary health educational programs and trainings in order to provide up-to-date information and deliver the best practice to control the COVID-19 disease in our higher institution in Lokoja. Nevertheless the objective one was achieved by review a related work and the two objectives were achieved by using chi-square method.

9. RECOMMENDATIONS

Based on the findings, it is recommended that the government should do awareness by coming out in group, through media and educating students in the school premises as a compulsory course for all level. To prevent further spread of the virus, civil societies and government agencies embarked on enlightenment campaigns for good hygiene and social distancing. Temperature screening must be conducted when coming inside the hostel, class and before entering the school gate for lecture and hostel. The NCDC in association with State governments also began tracing and tracking of possible victims and their contacts among students.

It is also recommend that machine learning techniques can also be apply to better achieve the objectives of this research. This research is limited to the paper which can not take a larger sample size or employ more relevant empirical methods.

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