EXPONENTIAL SPREAD OF COVID-19 PANDEMIC IN EUROPE AND AMERICA - A PUBLIC PERCEPTION SURVEY

Saivarshine S[1], Ganesh Lakshmanan[2], Gayathri R[3]
[1]*Department of Anatomy, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, India*
[2]*Senior Lecturer, Department of Anatomy, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, India*
[3]*Assistant Professor, Department of Biochemistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, India*
[1]*151901021.sdc@saveetha.com*
[2]*ganesh.sdc@saveetha.com*
[3]*gayathri.sdc@saveetha.com*

ABSTRACT:
Coronavirus (Covid-19) upsurge is the current outbreak (SARS-COV-2) which has spread to many other countries from the sea markets of Hubei Province,Wuhan, China. Following the initial outbreak, there was a major and exponential spread of COVID-19 pandemic in Europe and America. The rate of detection of new cases and mortality rate in Europe and America surpassed even the actual cases of China and even went many fold than the chinese cases. This study aims at bringing the public perception towards this phenomenon. An online survey was conducted with a self-structured questionnaire comprising 15 questions that were distributed through the google forms. The sample size of this study was 100. The results were analysed by performing percentage distribution and chi square analysis using the statistical software "SPSS version 20". The data was analysed and the output represented as pie charts and bar charts. People of different age groups largely had a good idea about the reasons for the exponential spread of COVID-19 pandemic in Europe and America. This study analysed the statistics on the knowledge among the public about reasons for exponential spread of covert 19 pandemic in Europe and America and a majority of population were of the opinion that prompt government action and policies can save lives. COVID-19 is a pandemic which is spreading rapidly all over the world in a very short period of time. In general, the public perception is that for preventing the instantaneous transmission of the virus, preventive measures by government policies and maintaining good health conditions among the people are critical to get a favourable outcome.

KEYWORDS: America, COVID-19, Europe, Exponential spread, Reasons

INTRODUCTION:

COVID - 19 (Coronavirus upsurge) is the current outbreak (SARS - COV2) which has spread to many other countries from China (Velavan and Meyer, 2020). The epidemic rapidly expanded to Europe, North America, Asia and the Middle East at alarming levels of spread, WHO officially characterised the COVID-19 situations as an outbreak pandemic (Bedford *et al.*, 2020). The outbreak hit Europe, as of March 20, 2020, Italy has the second largest number of confirmed cases, after China. All other European countries including Spain, Germany, and the United Kingdom also appeared to be in similar situations, within a short time-lag of a couple of weeks (Saglietto *et al.*, 2020). The novel coronavirus spread outside

China spanning 25 countries over the next few months worldwide from China. Early local transmission outside China was reported in Germany, France, Japan, Malaysia, Singapore, South Korea, Spain, Thailand, Vietnam, Iran, the United Arab Emirates, the UK and the USA. Almost all the habitat continents reported confirmed cases of COVID-19 (Gilbert *et al.*, 2020).

To contain COVID-19 spread in the United States from the present scenario, it might require severe social distancing measures maintained for an entire year or even 18 months to avoid severe public health consequences (Atkeson, 2020). Pioneering the fast-growing epidemic, European countries have put into action, non-pharmaceutical interventions including case isolation, closure of schools and universities, banning of mass gatherings, public events and social distancing which is the key element of prevention including local and national lockdowns (Flaxman *et al.*, 2020). The size and persistence of the economic impact is unfathomable. The disease is still spreading rapidly in dozens of countries (Baldwin and Tomiura, 2020).

Previously our team had conducted numerous clinical trials (Seppan *et al.*, 2018); (Sekar *et al.*, 2019); (Johnson *et al.*, 2020), forensic trials (Keerthana and Thenmozhi, 2016; (Krishna, Nivesh Krishna and Yuvaraj Babu, 2016); (Pratha, Ashwatha Pratha and Thenmozhi, 2016);(Keerthana and Thenmozhi, 2016); (Subashri and Thenmozhi, 2016); (Nandhini *et al.*, 2018)), survey based studies (Thejeswar and Thenmozhi, 2015)(Samuel and Thenmozhi, 2015); (Sriram, Thenmozhi and Yuvaraj, 2015); (Thejeswar and Thenmozhi, 2015), review based studies (Menon and Thenmozhi, 2016)(Hafeez and Thenmozhi, 2016); (Menon and Thenmozhi, 2016), and *in vitro* studies (Choudhari and Thenmozhi, 2016); (Kannan and Thenmozhi, 2016) by students over the past 5 years. Now we are focusing on epidemiological surveys. The idea for this stemmed from the current interest in our community. The main aim of the study is to analyse and study the public perception of reasons for the exponential spread of COVID-19 pandemic in Europe and America. This study hopes at fulfilling the effective spread on awareness and spread of COVID-19 which is unpredictable and assessing the opinion of the general public about the pandemic spread in Europe and America.

MATERIALS AND METHODS:

A self-structured questionnaire survey based on the reasons for the exponential spread of the COVID-19 pandemic in Europe and America was created . The questionnaire was validated in a standard manner using internal and external validity measures. To minimize the errors due to sampling bias measures such as selecting participants randomly, steps to prevent asking irrelevant questions and age groups are taken. It was a cross-sectional observational study comprising a study population of sample size of 105 people belonging to all age groups that were circulated to the general public on an online survey link using google forms. The study population was asked to take up the survey. The results were analysed by performing the statistical software "SPSS VERSION 20". The data was represented in the pie chart and bar chart formats.

RESULTS AND DISCUSSION:

The results and statistics were analysed using SPSS software. Majority of the respondents were assessed to have good knowledge about the reasons for the exponential spread of the COVID -19 pandemic in Europe and America.

When asked about the exponential spread of COVID-19 pandemic in Europe and America (Fig 1), 100% respondents - 79% respondents were aware about the pandemic and 21% were not aware of it. According to (Saglietto *et al.*, 2020), the outbreak hit Europe as of March 20, 2020, Italy had the second largest

number of confirmed cases after China. All the other European countries also appeared to be in a similar situation, with just a short time lag of a couple of weeks.
When asked if they know America has limited measures to control the virus spread compared to the other countries (Fig 2), 100% respondents - 71.4% voted 'Yes' , 28.6% voted 'No'. Bar Chart representing association between gender and knowledge on exponential spread of COVID-19 in Europe and America. Out of 79% of the participants who had answered yes the pandemic spread widely, 43% constituted males and 36% constituted females. Out of 21% of the participants who answered no while 13% participants were male and 8% participants were female. Hence there is no difference between the gender and knowledge exponential spread of COVID-19 in Europe and America. Pearson chi square value: 0.378 , P value = 0.540 (>0.05) is statistically not significant (Fig.14). According to (Omer, Malani and Del Rio, 2020) stated that COVID -19 infection as identified in Washington state on January 20, 2020 more than 235000 cases have been identified across the US in just over two months. The challenges in expanding testing capacity and the faces of people under investigation, the number of cases is likely much higher.

When asked if the spread is faster than the testing capacity (Fig. 3), amog 100% respondents, 62.9% think it's 'True', 37.1% think it's 'Not true'. According to (Sohrabi *et al.*, 2020), the virus is spread by human - to - human transmission via droplets or direct contact and infection (Hafeez and Thenmozhi, 2016) has been estimated to have an incubation period of 6.4 days and a reproduction number of 2.24-3.58. When asked if they think public health services are uneven so that the virus spread so quickly (Fig. 4), out of 100% respondents, 75.2% agree and 24.8% disagree. Bar chart representing association between gender and knowledge on exponential spread of COVID-19 in Europe and America. Out of 79% of the participants who had answered yes the pandemic spread widely, 43% constituted males and 36% constituted females. Out of 21% of the participants who answered no, 13% participants were male and 8% participants were female. Hence there is no difference between the gender and knowledge exponential spread of COVID-19 in Europe and America. Pearson chi square value: 0.378 , P value = 0.540 (>0.05) Statistically not significant (Fig.15). According to the survey, as the virus spreads so rapidly, WHO (World Health Organization) declares a global emergency.

When asked if they think medical professionals (Li *et al.*, 2020) with the most affected in America and Europe (Fig. 6), 100% respondents - 66.7% say 'Yes' and 33.3% say 'No'. Bar Chart representing association between gender and knowledge on medical professionals in Europe and America. Out of 67% of the participants who had answered yes that they knew about the medical professionals in Europe and America, 37% constituted males and 30% constituted females. Out of 33% of the participants who answered no, 19% participants were male and 14% participants were female. Hence, there is no difference between the gender and knowledge on medical professionals in Europe and America. Pearson chi square value: 0.050 , P value = 0.824 (>0.05) Statistically not significant (Fig. 16). According to a report by Grasselli(Grasselli, Pesenti and Cecconi, 2020),card positive cases kept increasing and the increasing ICU search capacity in order to treat the patients (Choudhari and Thenmozhi, 2016).

When asked if they think human and material resources are not guaranteed (Fig. 5), out of 100% respondents, 72.4% agree and 27.6% disagree. According to (Ozili and Arun, 2020) , Spillover of Covid - 19 has a great impact on the global economy. When asked if they think there is a lack of sanitary material to the hospital for the kind of crisis which is the major cause (Fig. 7), among 100% respondents, 80% say 'Yes' , 20% say 'No'. According to (Onder, Rezza and Brusaferro, 2020), case of fatality rate and the characteristics of patients dying in relation to COVID-19 in Italy was discussed.

When asked if the pandemic is widely spread in Spain and Italy (Fig. 8), 100% respondents - 80% agree and 20% disagree. (Rudan, 2020). Bar chart representing association between gender and knowledge on medical professionals in Europe and America. Out of 67% of the participants who had answered yes that they knew about the medical professionals in Europe and America, 37% constituted males and 30% constituted females. Out of 33% of the participants who answered no, 19% participants were male and 14% participants were female. Hence there is no difference between the gender and knowledge on medical professionals in Europe and America. Pearson chi square value: 0.050 , P value = 0.824 (>0.05) statistically not significant (Fig. 17).

When asked if Spain has elderly population who are more vulnerable to the infection (Fig. 9). Out of 100% respondents, 79% agree and 21% disagree (Nikolich-Zugich *et al.*, no date). When asked if the public health systems had major gaps in the early detection of the infections (Fig. 10), out of 100% respondents, 76.2% agreed and 23.8% disagreed (MacIntyre and Heslop, 2020). When asked if countries use PCR (Polymerase chain reaction) which is the only method used to analyze the virus (Fig. 11), in 100% respondents, 83.8% agree and 16.2% disagree (Saglietto *et al.*, 2020). When asked if social distancing is the major procedure advised to combat the spread of hundred percent respondents (Fig. 12), 85.7% agree and 14.3% disagree (Ke *et al.*, 2020). The future scope of the study includes enabling one to create and analyse the reasons on the spread of COVID-19 pandemic in Europe and America with a larger population. The limitations of the study includes minimum articles referred and a minimal sample size.

CONCLUSION:

By the survey it can be concluded that the general perception of the public is that a more severe approach and aggressive policy making could have averted and mitigated the COVID-19 catastrophe in the western world. A comparative analysis of steps taken by the governments which handled the COVID-19 crisis well and those didn't could be useful to form protocols in future pandemics.

AUTHOR CONTRIBUTION:

All the authors contributed equally in concept, design, carrying out the research and analysis of the study.

CONFLICT OF INTEREST:

The authors have none to declare.

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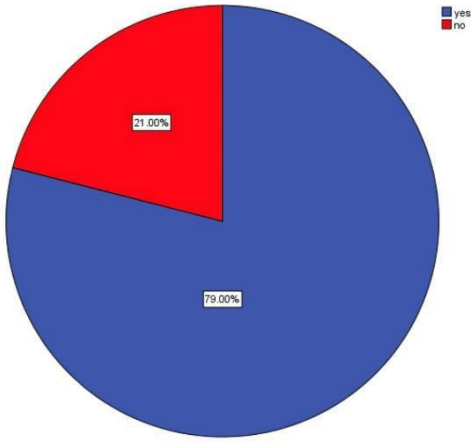

Figure 1: Shows the percentage distribution of responses for the awareness of COVID-19 pandemic raged in the states of America and Europe. A majority of participants, 80%, were aware of it (blue) and only 20% were not aware of it (red)**.**

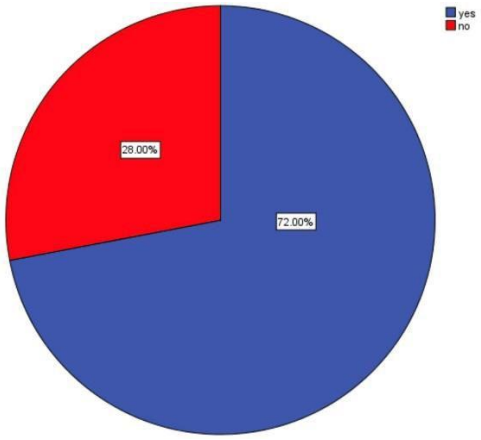

Figure 2: The percentage distribution of responses on America's limited capability measures to control the virus spread compared to other countries. A significant no of participants to about 71.4% were accepting it (blue), and 28.6% were not accepting (red) it**.**

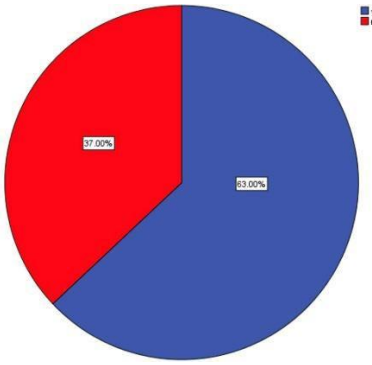

Figure 3: The percentage distribution of responses about the spread of the infection being faster than the testing capacity - A total of 62.9% held an affirmative response (blue) for it, and 37.9% gave a negative response (red)**.**

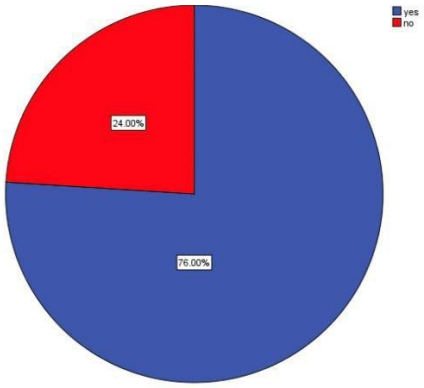

Figure 4: The percentage distribution of responses on the unevenness of public health services as a reason for the rapid spread of the virus. A vast majority of respondents to about 75.2% responded with a positive response (blue), and 24.8% with a negative response (red)**.**

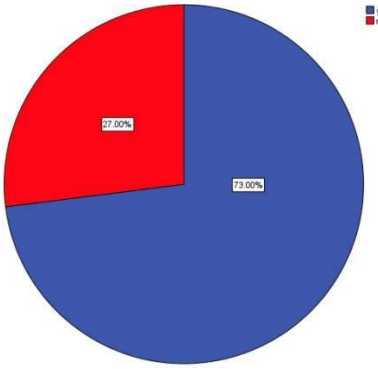

Figure 5: The percentage distribution of responses of the participants on human and material resources which are not guaranteed during the pandemic -72.4% agreed that there is a lack of guarantee for human as well as material resources positive (blue) and 27.6% did not agree with the statement (red)**.**

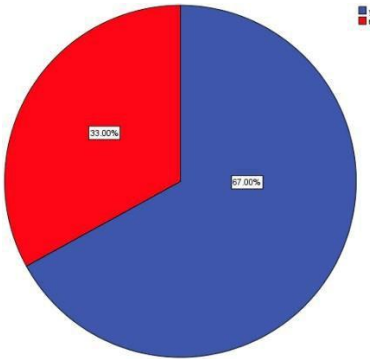

Figure 6: Percentage distribution of responses about medical professionals were the most affected in America & Europe - A significant no. of 66.7% participants accepted it (blue), whereas 33.3% gave a negative response (red)**.**

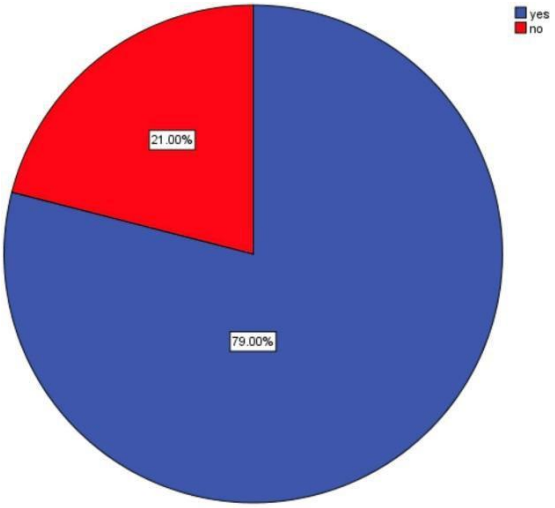

Figure 7: Responses for the lack of sanitary material in the hospital for this kind of crisis which is the major cause - 80% of the participants agreed that the pandemic raged due to the lack of sanitary material in the hospital (blue) and 20% disagreed (red)**.**

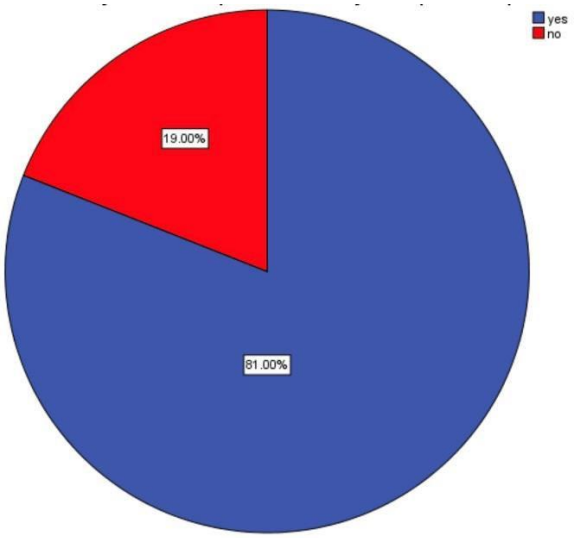

Figure 8: Percentage distribution of responses about the awareness of pandemic spread in Spain & Italy - 80% were aware of the spread (blue) and 20% were not aware (red)**.**

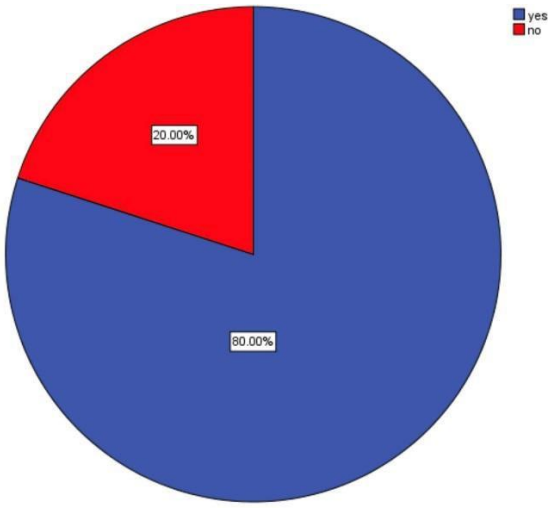

Figure 9: Responses for Spain that has elderly population who are more vulnerable to the infection - A vast majority of 79% gave a positive response (blue), and 21% gave a negative response (red)**.**

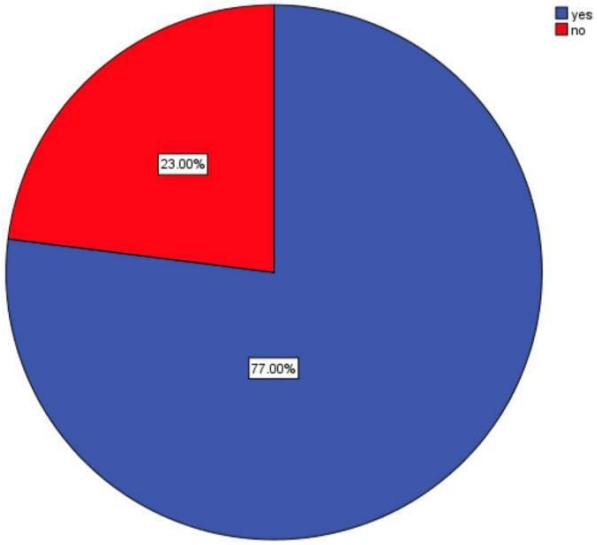

Figure 10: Responses about major gaps in Public Health Systems in the early detection of the virus - 76.2% of the participants say in response that the public health systems in Europe and America had major gaps in the early detection of the virus(blue), 23.8% responded that there were no major gaps in the system of detecting virus (red)**.**

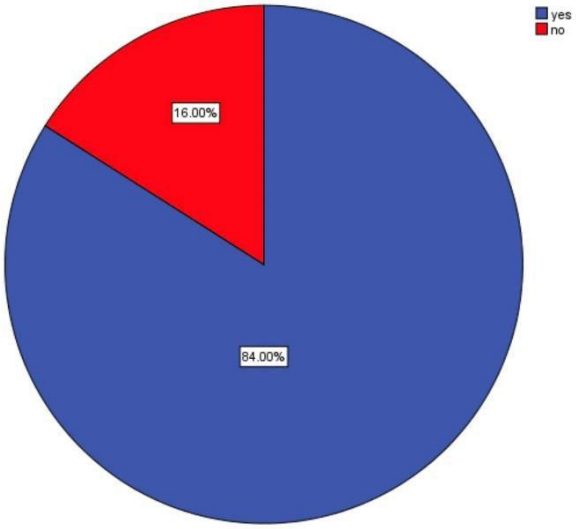

Figure 11: Responses of countries that use PCR(Polymerase Chain Reaction) - majority of 83.8% participants responded that they were aware (blue), and 16.2% responded that they were not aware (red)**.**

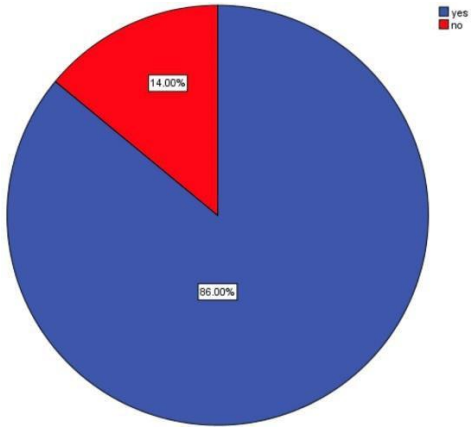

Figure 12: Responses for social distancing is the major procedure advised to combat the spread - 85.7% participants say in response that social distancing is very important in the battle against the coronavirus (blue), 14.3% participants responded negatively (red)**.**

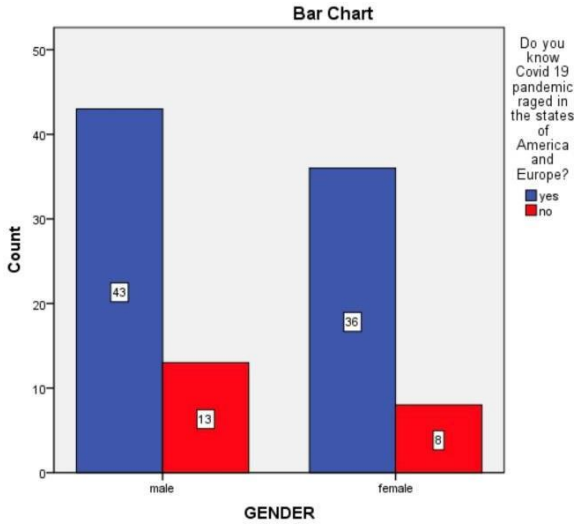

Figure 13: Association between gender and knowledge on exponential spread of COVID-19 in Europe and America. X-axis represents Gender and Y - axis represents the number of participants who answered yes (blue) and no (red). Out of 79% of the participants who had answered yes, 43% constituted males and 36% constituted females. Out of 21% of the participants who answered no, 13% participants were male and 8% participants were female. Even though males are more aware than the females, an association to gender and knowledge under discussion was found to be not significant by Pearson chi square test (chi square value: 0.378, df-1, P value = 0.540) at a confidence interval of 95%. Thus statistically the males and females have the same opinion and knowledge on exponential spread of COVID-19 in Europe and America

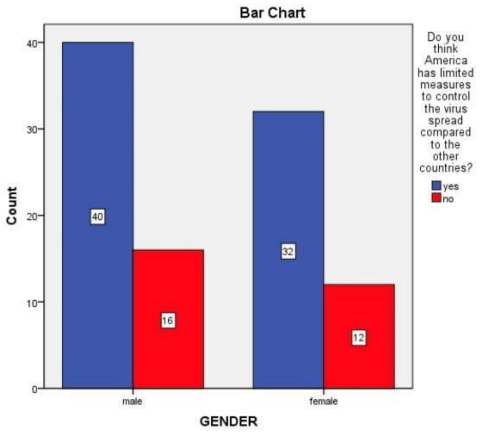

Figure 14: Association between gender and knowledge on control measures in America. X-axis represents Gender and Y - axis represents the number of participants who answered yes (blue) and no (red). Out of 72% of the participants who had answered yes that they knew the control measures were limited in America, 40% constituted males and 32% constituted females. Out of 28% of the participants who answered no, 16% participants were male and 12% participants were female.Even though males seemed to be more aware than the females, an association to gender and knowledge under discussion was found to be not significant by Pearson chi square test (chi square value: 0.021 , df-1, P value = 0.886) at a confidence interval of 95%. Thus statistically the males and females have the same opinion and knowledge on the lack of effective control measures in America.

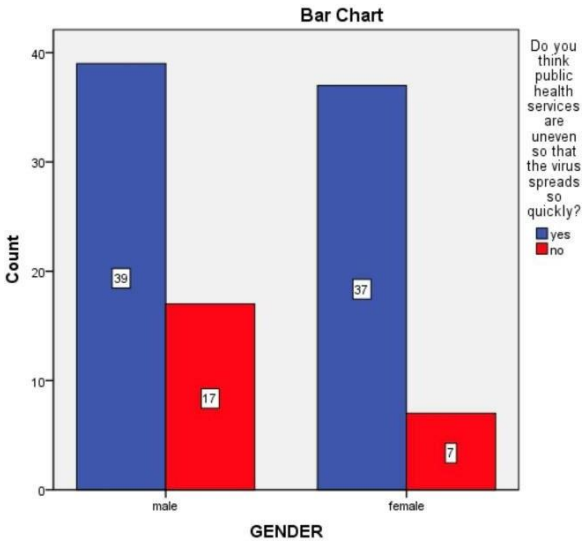

Figure 15: Association between gender and knowledge on public health services in Europe and America. X-axis represents Gender and Y - axis represents the number of participants who answered yes (blue) and no (red). Out of 76% of the participants who had answered yes that they knew about the public health services in Europe and America, 39% constituted males and 37% constituted females. Out of 24% of the participants who answered no, 17% participants were male and 7% participants were female. Even though males seemed to be more aware than the females, an association to gender and knowledge under discussion was found to be not significant by Pearson chi square test (chi square value: 2.820 , df-1, P value = 0.093) at a confidence interval of 95% claiming no gender based bias on the perception of lack of effective control measures in America.

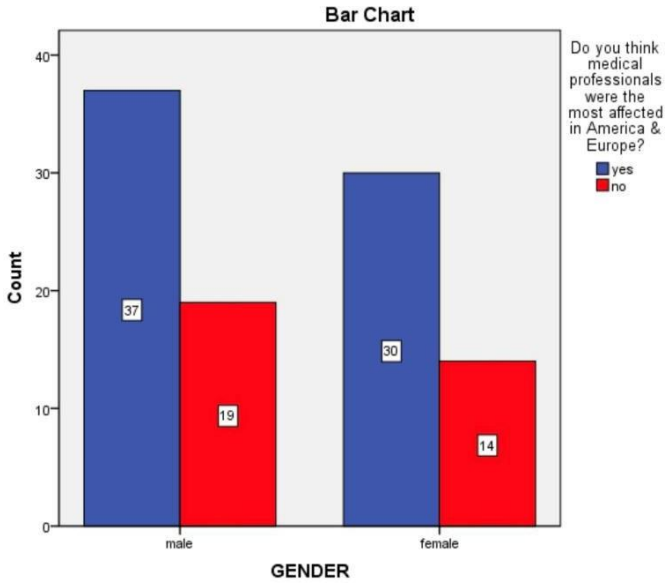

Figure 16: Association between gender and knowledge on medical professionals in Europe and America. X-axis represents Gender and Y - axis represents the number of participants who answered yes (blue) and no (red). Out of 67% of the participants who had answered yes that they knew about the medical professionals in Europe and America, 37% constituted males and 30% constituted females. Out of 33% of the participants who answered no, 19% participants were male and 14% participants were female. Even though males seemed to be more aware than the females, an association to gender and knowledge under discussion was found to be not significant by Pearson chi square test (chi square value: 0.050 , df-1, P value = 0.824) at a confidence interval of 95% and it can be assumed males and females are equally aware about their knowledge on the affected status of medical professionals in Europe and America.

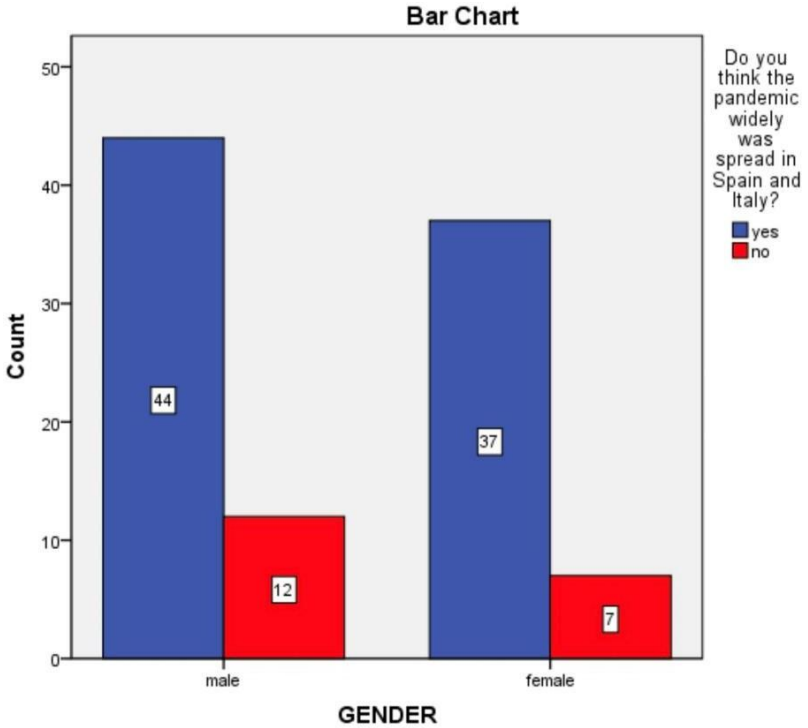

Figure 17: Association between gender and knowledge on pandemic spread in Spain and Italy. X-axis represents Gender and Y - axis represents the number of participants who answered yes (blue) and no (red). Out of 81% of the participants who had answered yes that they knew about the medical professionals in Europe and America, 44% constituted males and 37% constituted females. Out of 19% of the participants who answered no, 12% participants were male and 7% participants were female. Even though males seemed to be more aware than the females, there is no statistical difference between the

gender and knowledge of pandemic spread in Spain and Italy when tested by by Pearson chi square test (value: 0.488, df - 1, P value = 0.485) at a confidence interval of 95%. Thus males and females are equally aware about the knowledge on pandemic spread in Spain and Italy.