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Knowledge, attitude, and practice toward the COVID-19 virus among people from Trinidad and Tobago

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ABSTRACT

Background: The Novel Coronavirus Disease (COVID-19) is a highly infectious disease which has affected over 250 million people globally. This study was conducted to assess the knowledge, attitude and practice of persons from Trinidad and Tobago to the virus

Methods: A cross-sectional study was conducted online from July to September 2020 among nationals and permanent residents of Trinidad and Tobago (N = 812). The questionnaire consisted of demographic characteristics, 11 items on knowledge, 11 items on attitude and 7 items on practice. Domain scores were derived for each component (K, A and P) and independent t-tests and one-way ANOVA were used to compare differences in scores within demographic categories.

Results: The population possessed a high level of knowledge about COVID-19 (0.85 ± 0.09). Attitude scores (0.54 ± 0.07) were influenced by factors such as sex, age, occupation, level of education and area of residence. Significant relationships ($P<0.05$) were found between demographic categories of sex, age, profession, education, geographical region and the mean domain scores.

Conclusion: There was overall high level of knowledge and people followed the recommended guidelines in response to COVID-19.

Keywords: COVID-19, KAP survey, Trinidad and Tobago, Knowledge, Attitudes, Practices

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Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (COVID-19) has affected over 250 million people globally and resulted in over 5 million deaths since it was first reported in November 2019. Many countries tried to reduce the spread of the virus by implementing public health guidelines such as social distancing, hand washing, wearing face mask and lockdown procedures which involved the closure of boarders, shutdown of schools and public spaces, closure of businesses and limitation on gatherings. The effectiveness of these guidelines depended on the level of knowledge, the attitude and practice of the population with regard to COVID-19 (Tachfouti et al. 2012; Ajilore et al. 2017). Various studies have shown that attitude towards COVID-19 were highly associated with the level of information and education of the population (Roy et al. 2020; Zhong et al. 2020). Understanding how individuals perceive risks was also a key factor in committing to the prevention of diseases during outbreaks (Smith 2006; Janjua et al. 2007; Lau et al. 2007; Corrin et al. 2017; Roy et al. 2020).

Trinidad and Tobago which is located in the Caribbean, reported its first confirmed case of COVID-19 on March 12th 2020.This prompted the governments to act decisively and initiated the first national lockdown between March 21st to May 15th, 2020. During this period, a total of 116 COVID-19 cases were reported, consisting mainly of nationals returning from aboard. Lifting of the restrictions in Trinidad and Tobago happened on a phased basis from May 15th to June 7th, 2020. Phase 1 occurred between May 1st to May 23rd, 2020, with food and hardware establishments opening for limited hours or operation. Phase 2 occurred from May 24thto June 6th, 2020, with the reopening of the manufacturing sector. However, two additional waves of infections occurred in July 2020 and March 2021 respectively and prompted the reinstatement of lockdown measures. By January 2021, the total number of confirmed cases reached 7500 with 134 reported deaths. The period November 30th 2020 to January 27th, 2021 also revealed significant reduction in the number of daily cases. The third wave in 2021 resulted from the introduction of the Gamma variant and saw case numbers increase again, to over 35,000 with over 900 deaths.

Information about COVID-19 from social media, the internet, or unofficial sources can influence individual responses and behaviours which can potentially prevent or promote the disease (Ferdous et al. 2020). KAP studies can be useful in determining the efficacy of public education strategies and provide a reference to determine where intervention may be necessary. They are also helpful in addressing any inadequacies in knowledge about the disease, improving preventative strategies with higher chances of public compliance, and designing outreach initiatives to support public mental health wellness in addition to comprehensive health promotion programs. There has been a limited number of studies on knowledge, attitudes and practices that have been conducted on acute respiratory diseases in Trinidad and Tobago or within the Caribbean (Johnson and Hariharan, 2017; Henry, 2020). This study assesses the knowledge, attitude and practices of the people in Trinidad and Tobago following two nationwide COVID-19 lockdowns.

Method

Study Design

An online KAP survey was conducted among nationals and permanent residents of Trinidad and Tobago aged 18 years or older. The survey was conducted from July to September 2020, following two nationwide lockdowns implemented by the government of Trinidad and Tobago. The study was approved by the Campus Research Ethics Committee of the University of the West Indies, St. Augustine Campus (Ref: CREC-SA.0414/06/ 2020). Informed consent was obtained from respondents before being asked to complete the questionnaire. All subjects were informed of the purpose of the survey and participation was voluntary.

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Population

The population of Trinidad and Tobago was estimated to be 1,366,725 (CSO 2020). The main study areas were; Northwest, Northeast, Central, Southwest Trinidad, Southeast Trinidad, and Tobago (Table 1). Sample size was determined based on the formula nh = (Nh / N) * n (h is a stratum, nh is the sample size for h, Nh is the population size for h, N is the total population size, and n is the total sample size). The minimum sample size for Trinidad was 367 and 18 for Tobago (Table 1).

Data collection

Data collection was done using an online survey that was constructed and distributed via Google forms. The online survey was set up such that all questions had to be completed before submission. A Google form link was shared with the public, civil groups, religious groups, companies, educational institutes and professional societies via email and social media platforms such as Facebook, Whats App and Instagram.

Table 1. Populations of different study areas in Trinidad along with corresponding minimum sample sizes and actual number of respondents interviewed

Study area	Population	Minimum sample size	Actual number of respondents
Northeast Trinidad	75766	22	192
Northwest Trinidad	546014	158	193
Central Trinidad	261926	76	195
Southeast Trinidad	86837	25	50
Southwest Trinidad	296601	86	144
Tobago	61000	18	28

Survey tool and scoring method

The questionnaire was constructed in consultation with medical professionals and based on the information about COVID-19 from the World Health Organization (WHO), and the Centres for Disease Control (CDC). A pre-tested questionnaire was validated with 20 participants of varied demographic backgrounds and modified based on the feedback received. Reliability of the questionnaire was tested by determining the Cronbach's alpha coefficient. The final questionnaire consisted of four main sections: 1) Demographics of the participants, 2) knowledge about COVID-19, 3) attitude toward COVID-19, and 4) practice relevant to COVID-19.

Demographic variables included sex, age, nationality, marital status, information on the number of people in the household, the number of people over 60 years old, occupation, level of education, household income and the area of residence within Trinidad and Tobago. The knowledge section consisted of 12 questions about the causes of COVID-19, transmission routes, susceptible populations, clinical manifestation, treatment and methods of decreasing spread. A binary scoring system was used in which correct responses were given a score of 1 and incorrect or uncertain responses were given a score of 0.

The attitude section consisted of 10 questions with response choices based on a five-point Likert scale. Four questions were positively keyed and examined whether participants felt that COVID 19 was manageable given the public health measures that were implemented. Five questions were negatively keyed and examined fears and impacts on daily life caused by COVID-19 (Singh et al. 2018). Positively keyed questions were scored as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Scoring was reversed for negatively keyed questions, such that the most positive possible attitude would have a total possible score of 55 while the most negative attitude received a score of 0.

A total of 7 practice questions focused on the

use of appropriate information sources and preventative measures. Practices which conformed to the recommendations of the Trinidad and Tobago Ministry of Health, WHO and CDC were assigned a score of 1 while those of others were given a score of 0. The questions were both single-option and multi-option with the highest possible, total practice score being 25.

Data analysis

Data was analysed using the SPSS (version 25) software. Total scores were calculated for each respondent in terms of knowledge, attitude, and practice respectively, and these were converted to domain scores by dividing the total score for the individual by the total possible score. Independent Student's t-tests and one-way ANOVA were used to assess mean domain scores associated with each component (K, A and P) and the differences within demographic categories.

Results

Demographic characteristics

The highest number of respondents was from west and central Trinidad which are considered urban areas. There was a sex bias as more females (64.7%) responded to the survey. Most respondents were young adults, single (51.4%), professionals (43.2), citizens of Trinidad and Tobago (98.3%) and possessed tertiary level education (70%). Totally, 62.6% of the respondents came from households with 3–5 people and 38.5% were from households with a total income greater than TT $15,000.

Knowledge

Over 90% of the participants knew that COVID-19 was a highly infectious respiratory disease caused by a virus, with the symptoms manifesting within 14 days. About 99% were able to recognise that high-risk groups were persons over 60 or those with co-morbidities, but only 66.3% considered young children to be at risk. About 96% knew that the main symptoms of COVID-19 were breathing difficulty, fever, chills, and coughs while the least recognized symptoms were nausea or vomiting (53.9%), diarrhoea (57.3%), and nasal congestion (69.3%). Participants generally had satisfactory knowledge of the protocols in place to minimise the risk of transmission and infection. And 98.9% of the participants assumed that public education could also mitigate the spread of COVID-19.

The mean knowledge domain score was 0.85 ± 0.09. The knowledge scores were significantly different ($P<0.05$) across sex, age, marital status and occupation. Females scored higher than males, older participants scored higher than the younger ones and divorced and widowed participants scored higher than those who were single, married, or in common law relationships. The occupations with the highest scores in the knowledge domain were homemaker, businessperson, and retirees. No significant differences ($P>0.05$) were found among knowledge domain scores for categories belonging to nationality, number of persons in the household, education, income, or area of residence, respectively.

Attitude

Figure 1 shows the Likert attitude profiles for positively keyed and negatively keyed questions. Respondents felt that staying at home could effectively prevent COVID-19 transmission (92.2% agreed) and 77.3% felt they had sufficient information about COVID-19. A total of 67.6% believed that the country could successfully manage COVID-19 but only 59.4% were satisfied with the measures taken by the government.

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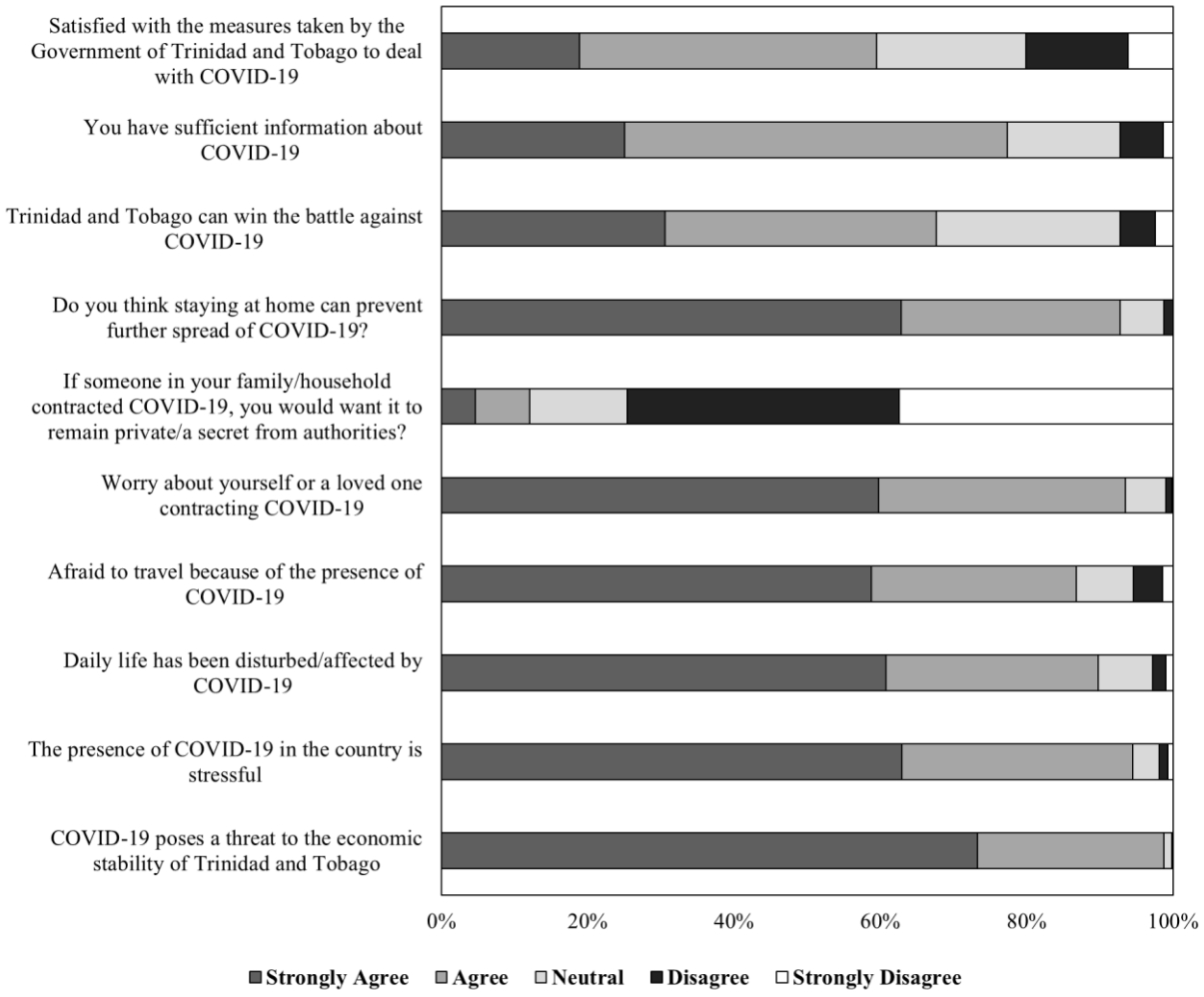

Figure 1. Attitude Profile for Likert Scale questions on COVID-19

Most of the respondents (98.8%) felt that COVID-19 posed to significant threat to the economic stability of Trinidad and Tobago. Approximately 94% found the presence of COVID-19 in the country to be stressful and 93.4% were worried that they or a loved one might contract the disease. Also 89.8% felt that their daily lives were affected by the presence of COVID-19 and 86.8% were afraid to travel. Only 12.1% of participants strongly agreed or agreed that they would want to conceal a case of COVID-19 in their household from the authorities. However, when this percent was combined with those who felt neutral about this matter, about 25.4% of respondents can be considered as a potential risk of irresponsible social practices.

The average attitude domain score was 0.54 ± 0.07. In total, 46.9% (381) of respondents attained or exceeded the average domain score and could therefore be considered to have good attitude towards COVID-19, while 53.1% (431) did not. Significant differences ($P<0.05$) in mean attitude domain scores were noted for the demographic categories of age, number of persons in household and area of residence. Females had higher scores than males, people of ages 25-54 scored higher than other age groups, homemakers, office workers, and professionals scored higher than other occupations, those with a master's degree or PhD and those with vocational education scored

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higher than other education categories, and those from north-east Trinidad scored higher than those from other areas. These higher scores represent the groups with the most positive outlooks about COVID-19 in Trinidad and Tobago.

Experiences and Practice

The experiences of respondent during the nationwide COVID-19 lockdown in Trinidad and Tobago varied (Figure 2). Of all the participants, 81.0% closely followed local updates on COVID-19 but only 48.0% felt very stressed by information about COVID-19. Also 46.4% successfully worked from home and 34.6% found the time at home relaxing. There were three types of income loss; 11.2% experienced layoffs, 20.6% experienced business closure, and 34.1% found themselves unable to work. Behaviour patterns to help manage the stress of this situation varied, with 21.1% left home occasionally to be alone, 16.4% left home to socialize in groups of 5 or less, and 6.7% left home to gather in groups of up to 10 people. Government regulations during the lockdown allowed individuals to leave home to spend time alone or in groups of no more than 5 people, provided that other protocols such as mask wearing, and social distancing is followed.

Respondents got their information about COVID-19 from various sources such as government web sites and social media (Figure 3). For the purposes of this study, only government release/official state press conferences, the WHO website, and the CDC website were considered appropriate sources of information. In total, 83.9% of the participants agreed that they would avoid travelling to a city or country with a high COVID-19 infection rate, and 85.5% of mentioned they took some precautions against COVID-19. Hand washing was the most common precautionary measure (85.6%) while not having visitors at home was the least common (74.1%). In terms of participants who did leave their homes, more than 55% of them followed precautions to prevent the spread of COVID-19 at home.

The mean practice domain score was 0.88 ± 0.10. Significant relationships were found between demographic categories and mean domain scores as follows: females scored higher than males, people of ages 35-44 had practice scores higher than other age groups, homemakers, professionals, and office workers had better scores than other professions, those with masters or PhD degrees and those with technical/vocational education had better practice scores than other educational backgrounds, and those from north-east and north Trinidad had better practice scores than other areas. These results closely accord with the mean knowledge domain analysis.

Medical Workers

A relatively small number of respondents were medical workers or had medical workers in their households (Figure 4) (1.4% and 5.8% respectively). Most (78.0%) households with medical workers took special precautions (outlined in Figure 5) to mitigate risk of COVID-19 transmission from medical staff to other members of the household.

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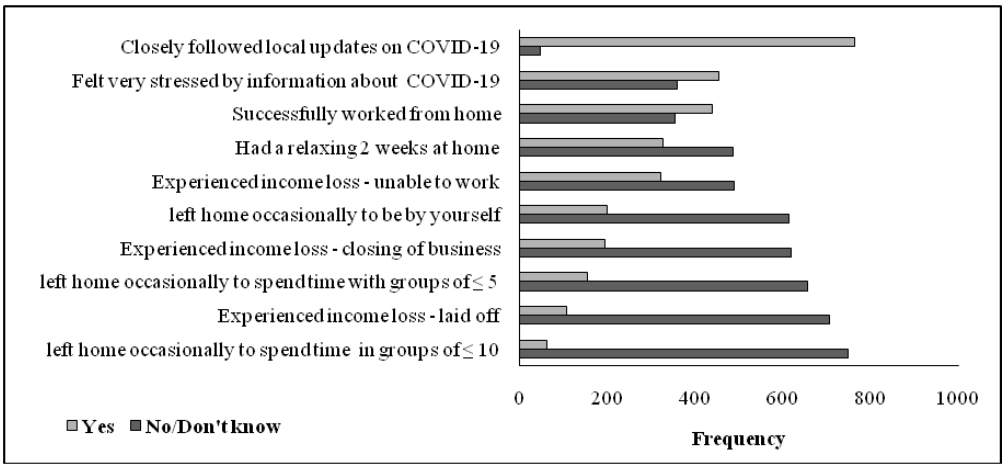

Figure 2. Experiences during the nationwide quarantine in Trinidad and Tobago

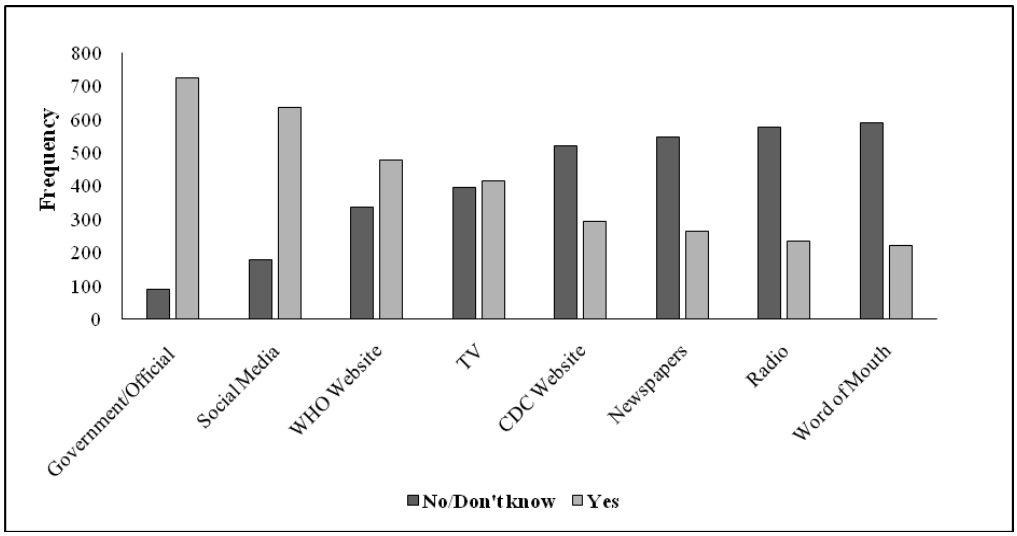

Figure 3. Sources of information about COVID-19

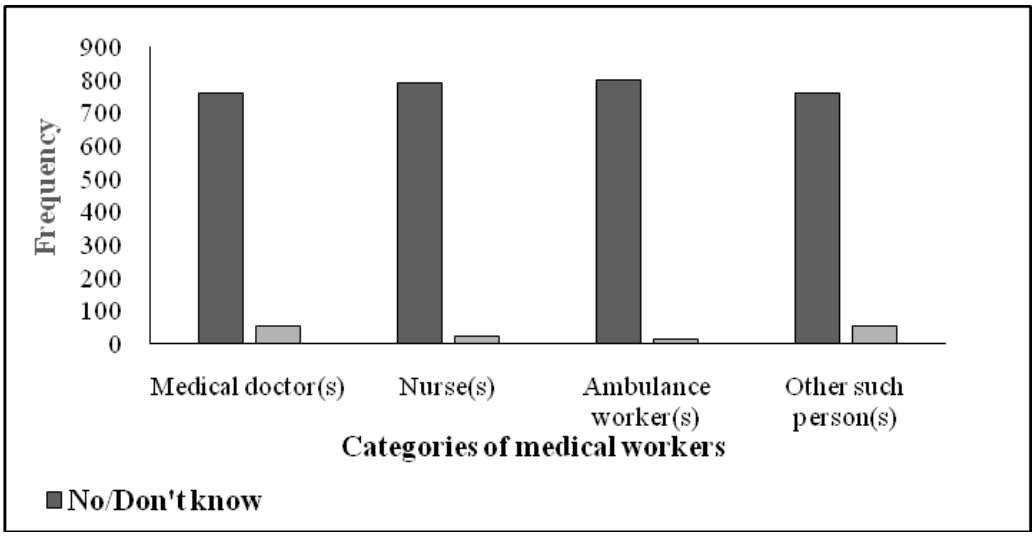

Figure 4. Number and type of medical workers per household

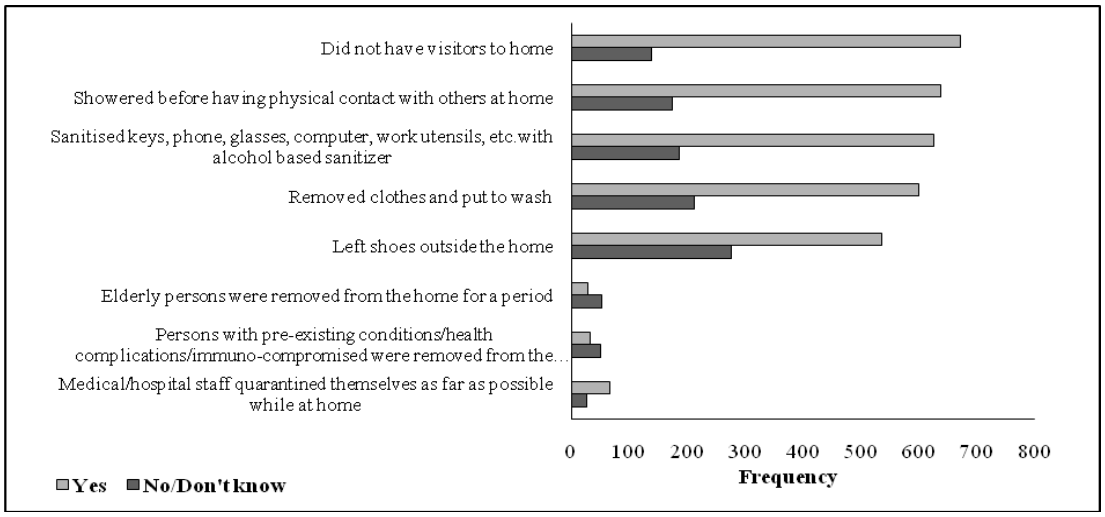

Figure 5. Precautions taken by households with medical workers

Discussion

To effectively manage the COVID-19 pandemic, the population's ability to adhere to the recommended preventative measures are of crucial importance. However, this is greatly influenced by their knowledge, attitude and practice towards the disease. In this study participants generally had satisfactory knowledge and good attitude. This high knowledge and attitude levels are in line with other studies conducted in China (Zhong et al. 2020) and Saudi Arabia (Quadri et al. 2020).

Demographics

The demographics of respondents were in agreement with expected patterns for online surveys. Most respondents were female, young, single and had tertiary level education. Warriner et al. (2002) and Porter and Whitcomb (2005) indicated that younger, more educated, and affluent individuals, as well as women (Smith 2008) are more likely to participate in online surveys. Approximately, 71% of respondents were from west and central Trinidad which are urban centres, and they may have had easier access to information.

Knowledge

The average knowledge domain score (0.85 ± 0.09) revealed that the population possessed a satisfactory level of knowledge about COVID-19. Studies by Al-Hanawi et al. (2020) and Ngwewondo et al. (2020) suggested that sex, age, area in which a person resides, education and income contributed to knowledge level. This study, however, revealed no significant differences in knowledge domain scores for education, income or area of residence, implying that these factors couldn't affect access to credible and timely information about the virus. The knowledge of the population can be attributed to the availability of reliable information which is provided through daily press conferences and public awareness campaigns via television, social media and print. This study identified that most respondents (> 90%) were aware that COVID-19 was a highly infectious respiratory disease caused by a virus and that the elderly and persons with comorbidities are most at risk. This might have been because public information emphasized the vulnerability of these two groups as well as essential workers. A lower percentage (66.3%) of the participants considered small children to be at risk from contracting the virus. Children spend less time outside their homes and are not taken to public areas to reduce the risk of exposure (Lee et al. 2020). At the time of this study, children under 18 years presented about 8.5% of reported cases (WHO 2020). Most of the participants were aware

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of the common symptoms (Ferdous et al. 2020); however, other symptoms such as nausea or vomiting were not as well-known which suggested a gap in public education. All the participants identified social distancing as a method to prevent or slow the spread of COVID-19, and most were able to identify other recommended precautionary measures such as wearing masks and avoiding public gatherings.

Attitude

This study revealed that age, occupation, level of education and area of residence contributed to good attitude scores which is similar to studies by Ferdous et al. (2020). Females scored higher than males, possibly due to a greater perception of the pandemic as having serious consequences and greater willingness to comply with guidelines (Galasso et al. 2020). Zhong et al. (2020) also reported that in China, females had satisfactory knowledge, optimistic attitude and appropriate practice with regards to COVID-19.

Older citizens showed higher attitude scores which may be due to increased precautions because of the greater risk for contracting COVID-19. Individuals with tertiary level education generally had more positive attitudes which correlate to conclusions from previous work that associate higher levels of knowledge with more confidence and positive attitudes during health crises (Azlan et al. 2020). Zhong et al. (2020) also suggest good knowledge being associated with more hopeful attitude and proper practice; hence education programs should be designed to improve COVID-19 knowledge to encourage better attitude and practice. This study demonstrated that about 59.4% of the respondents indicated that they were satisfied with the measures taken by the government. However, this was lower than the 74% previously reported by Henry (2020). Respondents felt mostly negative about the threat that COVID-19 posed to Trinidad and Tobago's economic stability since the country was already experiencing an economic slowdown caused by the collapse of oil and gas prices (Smets 2015; Ministry of Finance Trinidad and Tobago 2020). Energy exports declined by 56% in the first quarter of 2020 resulting in approximately 1.34 billion USD revenue loss for the 2020 financial year. Unemployment was expected to reach 5.04% in 2020 and 5.12% in 2021which also contributed to negative attitude. Internal economic slowdown from the closure of non-essential businesses and services also placed more strain on the economy. The United Nations Conference on trade and development (UNCTAD) reported that the pandemic would also cause a 30% to 40% reduction in direct foreign investment for the Caribbean. The Caribbean region is not as resilient as larger countries because of their limited resources and high dependence on the tourism industry, which is projected to have a slow recovery post pandemic. Some social relief has been provided through cash grants, rental assistance, deferral of loan instalments and food distribution drives; however, this cannot be sustained as the pandemic continues.

The majority of the participants were stressed about the presence of COVID-19 in the country, worried about contracting the virus and that their daily lives would be affected. Song (2020) also reported that long periods of quarantine led to psychological stress responses such as anxiety and frustration in China. In addition to psychological stress, approximately 12% of the participants in this study indicated that they would conceal if they or a family member was infected. This can hinder efforts in contact tracing and indirectly increase the risk for spreading the virus. Stress about having the disease, spreading it to family, and being a burden also adds to the interest of concealing a case. Another reason was the fear of loss of income and the lack of opportunity to take sick leave (Hunte 2020; Tekingunduz 2020). Knowledge and attitudes proved to have significant impact on emotions and personality, which influence the efficacy of preventive measures against infectious diseases (Ali et al. 2020)

Experiences and Practice

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More than half of the respondents indicated that they felt stressed by information about COVID-19. Savage (2020) suggested that the sudden and constant stream of information can cause a negative impact on those who face emotional and mental health issues. A lower percentage of the participants were able to successfully work at home and found the time to be relaxing, since the lack of defined office hours, person-to-person communication and change of location did not affect them (Routley 2020). Approximately 66% of the participants experienced income loss through layoffs, business closure and inability to work during the lockdown periods. Income loss was inevitable as many non-essential sectors closed operations, which led to temporary staff reduction and in some cases, closure of operations.

Government regulations during the lockdown periods allowed persons gather in groups of more than 5 individuals. This was a significant change as Trinidadian and Tobagonian culture involves socializing in- and after-work hang outs at village shops or bars and "liming on the block" (Nurse 2020). As such, not all persons may have fully accepted or adjusted to the nationwide lockdown; this is evident by a number of incidents involving citizens being arrested for public gatherings with more than 5 persons (Superville 2020). Officials usually bear limited capacity to enforce and monitor quarantine measures, therefore, the public health benefits from household quarantine requires public cooperation and personal responsibility. More than 80% of the participants agreed that they would avoid travelling into a city or country with a high COVID-19 infection rate and they that they observed precautions against COVID-19. Once participants left home, more than 50% followed public health guidelines. Over 80% practiced social distancing, avoided unnecessary travel and physical contact which indicated a general predisposition for participants to make behavioural changes in response to the pandemic.

Although findings in this study denoted that the public in Trinidad and Tobago generally bear good knowledge and practice with respect to COVID-19, there were indications of psychological stress. This may be indicative of worry, fear, frustration and anxiety in persons experiencing a disruption in their daily lives. Stress from infectious disease outbreaks can induce increased substance abuse as well as deterioration of mental and chronic health problems (CDC 2020). This highlights the urgent need for adopting and strengthening local strategies to assist persons in coping with stress, such as psychological crisis interventions (Song et al. 2020). Experts can devise appropriate COVID-19 health initiatives such as education campaigns that address mental health coping strategies or seek to improve current ones that focus on mental health. A number of strategies that target mental health have already been initiated by state and NGO bodies. For example, the COVID-19 helpline and national plan for mental health and psychosocial support was launched by the Ministry of Health, resources for coping with stress and anxiety disseminated by the Ministry of Works and crisis hotlines maintained by the Trinidad and Tobago Association of Psychologists that aim to help the people experiencing stress, anxiety and depression (TTAP 2020) as well as psycho-social support maintained by the Trinidad and Tobago Red Cross Society (TTRCS 2020). However, evaluation of these campaigns should be performed in order to understand the intervening factors that may be hampering the efficacy of these aids in mitigating psychological stress among the public. As the pandemic continues and governments take additional measures to safeguard the population, it is unclear how these are likely to impact the psychological wellbeing of individuals and the economic recovery of small island states like Trinidad and Tobago.

Conclusion

The findings indicated that participants generally had good knowledge, attitude and practices with regard to the existing COVID-19 pandemic. However, there was indication of high levels of stress resulting from the disruption of daily lives, the uncertainty of what is likely to

happen in the future and the resulting economic impacts. There may be a need for more tailored health education programs aimed at addressing the mental health issues that are emerging in the society.

Conflict of Interest

The authors have no relevant financial or non-financial interests to disclose.

The authors have no conflicts of interest to declare that are relevant to the content of this article.

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Author's contribution

Conceptualization, A.M.; Methodology, A.M., D.S., V.T.; Formal Analysis, V.T., D.S., L.A., A.M.; Investigation V.T., D.S., L.A., A.M.; Writing - Review & Editing, V.T., D.S., L.A., A.M. S.G., R.M., S.S., N.N.; Supervision, A.M., V.T.; Writing -Original Draft, D.S., L.A., S.G., R.M., S.S., A.M.

All authors have read and approved the final manuscript and are responsible for any question related to the article.

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