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Does the Fear of Needles Influence Jamaicans' Willingness to be vaccinated against COVID-19?

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Abstract

Introduction: As of November 21, 2021, the vaccination rate in the world is 55% (fully-vaccinated, 43%) compared to 22% in Jamaica (17% fully vaccinated), 70% in the United States and Canada, 66% in Latin America, Asia-Pacific (64%), Europe (62%), Middle-East (45%), and 9.7% in Africa. A variable proportion of each country's population is delaying or avoiding vaccination, which may hamper the success of vaccination programmes. The frequency of needle injections averaged from 2-11 per person each year in 10 major regions globally in a study conducted by the World Health Organization.

Aim & objectives: To explore whether *the fear of needles influences Jamaicans' willingness to be vaccinated?"*The objectives are 1) To examine respondent's perception of needle/injections, and 2) To determine whether the respondents had issues on COVID-19 Vaccines.

Methods and Materials: The study used an explanatory web-based cross-sectional design. A standardized questionnaire instrument consisting of fifteen closed-ended questions was disseminated via WhatsApp, Facebook, and face-to-face interaction in the fourteen parishes. The Statistical Packages for the Social Sciences (SPSS) 25 for Windows 27.0provided data analysis.

Findings: Most of the respondents were females living in Clarendon who were hesitant to take the vaccine due to *trypanophobia*. Of the total respondents, *62.6%(n=676)* avoided medication requiring administration through needles. The majority of the respondents *(31.2%, n=337)* was *three* on a scale of *1-5 (with 5 being the highest level of fear).*Most respondents *(43.6%, n=471)*

answered *"Yes"* when asked, *"If the needles were shorter would you take the vaccine?"*When asked if the following statement referred to the: *"My heart races when I think about getting an injection*", most of the respondents *(31.9%,n=344)* agreed. Age, fear of needles, and willingness to accept oral vaccination accounted for *21.6%* (*i.e., Nagelkerke* R^2) of the variance in vaccination status *(-2Ll=744.023; Omnibus test of Model coefficients:* $\chi^2(8)=117.109$, $P < 0.001$; *Hosmer and Lemeshow test:* $\chi^2(8)=10.750$, *P-value = 0.216).*

Conclusion: The influence of *trypanophobia* on COVID-19 vaccination rates in Jamaica must be considered when formulating future public media strategies, policymakers approach, and civic responsibility in reducing vaccine hesitancy among the population. Therapeutic healthcare provider and patient interactions are pivotal in increasing the patient's confidence, willingness toward treatment, and the strength to overcome trypanophobia.

Keywords: COVID-19, fear of needles, injection, needle, needle phobia, trypanophobia, vaccine acceptance, vaccine hesitancy.

Introduction

The initial report of the Coronavirus 2019 (COVID-19) by the World Health Organization (WHO) occurred on December 31, 2019, following pneumonia cases of unknown origins in Wuhan city, China(World Health Organization (WHO), 2020a, nd). The virus was declared a global health emergency on January 30, 2020 (WHO, 2020b, 2020c). Holder (2021) of the New York Times indicated that as of November 21, 2021, the vaccination rate in the world is 55% (fully-vaccinated, 43%) compared to 22% in Jamaica (17% fully-vaccinated), 70% in the United States and Canada, 66% in Latin America, Asia-Pacific (64%), Europe (62%), Middle-East (45%), and 9.7% in Africa. These statistics indicate that a variable proportion of the population in each country are delaying or avoiding vaccination, which may hamper the success of vaccination programmes.

A significant number of persons continue to be diagnosed with the COVID-19 virus. A more substantial number of individuals diedfrom the COVID-19due to the initial lack of knowledge of how to treat such a virus, making vaccines more critical. The fear of getting vaccinated may be hindering the current uptake in Jamaica.A renowned medical doctor, Professor Denise Eldemire Shearer, postulated that trypanophobia (i.e., the fear of needles or needle phobia) is accounting for some per cent of COVID-19 vaccine hesitancy among the Jamaican population (Lyons, 2021; Jamaica Observer, 2021), which is also the case across the globe (Carey & Harris, 2005; Carmin, 2019; Davis, et al., 2013; McLenon& Rogers, 2019; National Library of Medicine, 2021) and this extends to children (Cemeroglu, et al., 2015; Centers for Disease Control and Prevention (CDC), 2022; Sørensen, et al., 2020). A search of the literature revealed no empirical support for the perspective of Eldemire, and this means that the society continue to operate and plan in ignorance for the pandemic. The purpose of this study is to find out whether the fear of needles influence Jamaican's willingness to be vaccinated. Specifically: The study seeks to:1) To examine respondent's perception of needle/injections, and 2) To determine whether the respondents had issues on COVID-19 Vaccines.

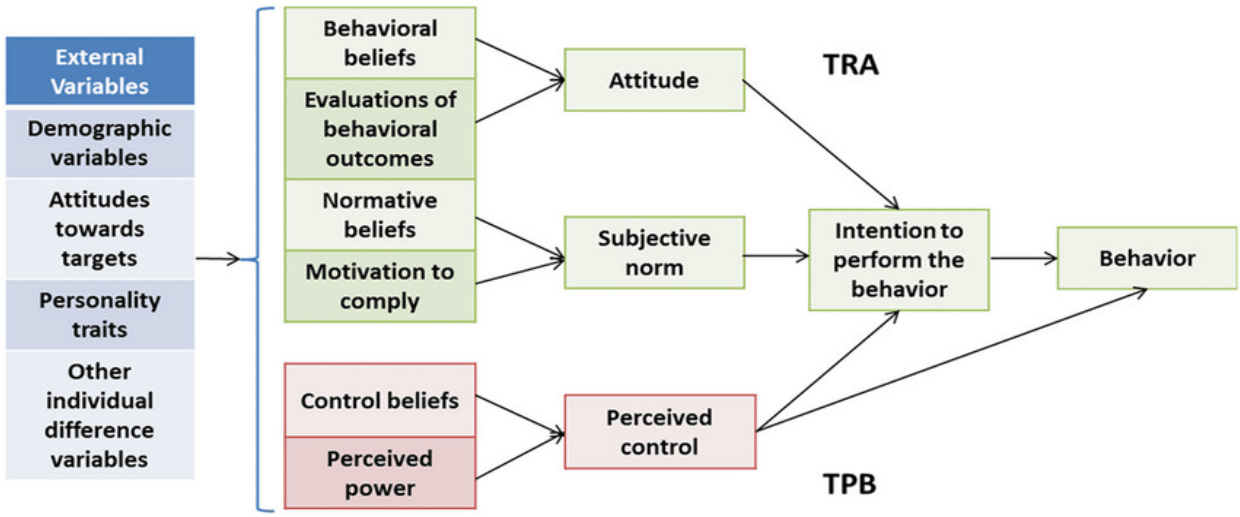
To contextualize the current study and answer the research question, a theoretical framework (i.e., *Theory of Reasoned Action and the Theory of Planned Behavior*) was developed to guide and better understand COVID-19 hesitancy as a result of trypanophobia in Jamaica.

Theoretical framework

Globally, varying perceptions exist on the vaccination process and the COVID-19 virus, leading to world leaders implementing additional measures. Social distancing, frequent hand washing and education were some of those measures. Despite the plethora of current information, individuals still have mixed feelings about vaccination. These feelings range from fear of needles to misunderstanding of information. A theoretical framework that addresses the study constructs is warranted to explore further the *"fear needles"* and their influence on vaccinations. This current study uses a theoretical framework reflecting the *Theory of Reasoned Action and the Theory of Planned Behavior* that aided the researchers in better assessing these phenomena. *(Figure 1)*.

According to Rural Health Information Hub (2018), the *Theory of Reasoned Action* and the *Theory of Planned Behavior* explain the association of beliefs and behaviour and implies that a person's health behaviour is determined by their intention to perform a behaviour (Ajzen, 1991; DeNicola et al., 2016; Fishbein & Ajzen, 2010; Hackman & Knowlden, 2014; Montaño & Kasprzyk, 2008). Attitude, subjective norms, and perceived behavioural control collectively influences an individual's behavioural intentions. An individual's attitude toward the behaviour and the subjective norms affects their intention to perform a behaviour (Fishbein& Ajzen, 1975). However, subjective norms result from the social and environmental surroundings and an individual's perceived control over the behaviour (Fishbein & Ajzen, 2010; DeNicola et al., 2016; Figure 1). Generally, a positive attitude and positive subjective norms result in greater perceived control and increase the likelihood of intentions governing changes in behaviour. The theory clarifies health behaviours, planning, implementing health promotion and disease prevention programs (DeNicola et al., 2016).

Furthermore, subjective norms describe the behaviours of healthcare providers, patients, care providers, and others in the community. Therefore, these theories provide a framework for answering this current study's research question, "*Does the fear of needles influences Jamaican's willingness to be vaccinated?*"An individual's decision depends on their attitude towards a particular situation, whether positive, negative or neutral. Using the theoretical framework *(Figure 1)* to address the research question, we anticipate that individuals will consider the vaccination process negative or positive. Furthermore, if individuals believe that the outcome of taking the vaccine is beneficial, they will have a positive attitude. If they believe the vaccine is not essential and has undesirable effects, they will react negatively.



Source: DeNicola, et al. (2016, p. 9)

Figure 1.Reason Action Theory/Theory of Planned Behaviour

Literature review

The vaccination process is a critical turning point during the COVID-19 pandemic. Scientists believe that in addition to the global vaccination initiatives, herd immunity also controls this virus. *Vaccines* are a proven technology for global public health initiatives in controlling and eradicating diseases (Ritchie et al., 2021). Within 12 months following the first outbreak, vaccines became available to the public. However, the challenge was in individuals accepting vaccinations.

The World Health Organization identified vaccination hesitancy as a possible threat to global health. The rapid development of the COVID-19 vaccines and the continued adverse reactions occurring worldwide underscores the tendency toward vaccine hesitancy. Due to the evolving nature of vaccine hesitancy, researchers recommend longitudinal studies to assess whether it will decrease as the vaccines become widespread among the world population (Baccolini et al., 2021; WHO, 2020). This current study explores whether the hesitancy of vaccine uptake among Jamaicans is attributable to the fear of needles.

Vaccine hesitancy is described as a *"delay in acceptance or refusal of vaccination despite the availability of vaccination services"* (MacDonald, 2015). In a recent interview, the Ministry of Health and Wellness revealed a daily increase in hospital admissions across the country, with a daily average of approximately 70 patients, higher than the 19 cases recorded between March and April 2021. Even though the COVID vaccine does not prevent the virus, it lessens severe illnesses and hospitalizations (Andrews et al., 2022; Cavaleri, 2021). This reality underscores the importance of continued vaccine uptake among the Jamaican population. Therefore, it is essential to understand the lack of uptake to implement the most effective vaccine strategies.

Vaccine hesitancy is complex because people delay or refuse vaccination for many reasons. A COVID-19 poll showed that of Canadians who did not plan on being vaccinated or were not sure, 6-7% had delayed previous vaccinations because of needle fear. These negative experiences can

have lasting effects. Most adults with high levels of needle fear report a negative previous experience. Needles are, to some degree, painful, and pain is subjective.

Some critical factors associated with vaccine hesitancy in the population of individual countries were lower perception of risk from the virus, less awareness of the collective benefits of vaccination, doubts about the efficacy of vaccination, fear of needles, and worry about potential side effects, particularly in the context of the rapid development and testing of the vaccines. Previous studies indicated that participants had anxiety about injections, fears about the needle size, and the vaccination. In children, adolescents and adults, fear of injection fall within the unitary specific phobia subtype of blood-injection-injury fears (Kendler et al., 2020; Loken et al., 2014; Muris et al., 1999; Wenzel & Holt, 2003). Fear of fainting may cause great reluctance to join a line of people waiting for a vaccine injection.

The frequency of needle injections averaged from 2-11 per person each year in 10 major regions globally in a study conducted by the World Health Organization (Hutin& Chen, 1999). These injections were among the most common procedures in preventing or treating various illnesses. The *"fear of needles"* may impede specific preventive measures, including vaccination, blood donation, and venipuncture during clinical evaluation and treatments for acute and chronic conditions (Wright et al., 2009).

According to Legg (2018), *trypanophobia* is an extreme fear of medical procedures involving injections or hypodermic needles, a term introduced in the literature by Hamilton (1995). Persons are usually afraid of needles because they are not used to the sensation of their skin being pricked by something sharp. The terms *"needle fear"* and *"needle phobia"* describe anxiety associated with needles and the use of needles or injections in some situations. The term trypanophobia will be used interchangeably with "the fear of needles" throughout this research. Since the start of the COVID-19 vaccine dissemination in Jamaica, the Jamaica Observer noted that citizens were hesitant to get vaccinated, coupled with noncompliance to protocols. Furthermore, during vaccination blitzes, some peoples' fear of needles or their avoidance of vaccination due to their fear was apparent.

Needle phobia occurs less often than the generalized fear or anxiety associated with needles (Wright et al., 2009). Classical conditioning based on shared negative experiences of painful procedures may also invoke needle fear or phobia (Jenkins, 2014). Vaccination is a well-known way of administering medication for various viruses or medical diseases; it has become a global way of treating conditions. The fear of needles or needle phobia is an increasingly important issue in medicine because of the modern reliance on injections and blood testing. Therefore, it is essential to understand that people's fear of needles translates into a "*phobia of needles*". While *fear of needles* develops from a substantiated fear of pain from an injection, phobias occur when there is an exaggerated sense of danger from the act of being injected. To the extreme, some individuals may have panic attacks when having procedures requiring needles.

According to Ratini (2021), fears are something that every individual has to deal with, while phobias are anxiety disorders that present more extreme symptoms and feelings. It is okay to feel fearful, and it is natural to feel anxious about things, especially procedures that include needles

coming in contact with your skin. While fear develops from a substantiated space of fear of having pain after getting an injection, phobias occur when there is an exaggerated sense of danger from a situation. Individuals may have panic attacks when in contact with needles.

The fear of needles is a possible factor causing some Jamaicans to refuse COVID-19 vaccination. *Reassurance* is a tactic used by healthcare professionals when giving injections. Statements such as, *"it is just a little stick*" or *"the needles are tiny and do not cause pain"*. There is a lack of awareness about the number of people afraid of need. Many receive hand holding back and shoulder-rubbing as a means of comfort (Lyons, 2021).

Some fears of needles may stem from hearing about immunization or any stress-related responses others experienced. The critical thing to know is that these immunization stress-related responses do not result from something wrong with the vaccine itself. Instead, they can occur before, during and after injections due to a stress response. Nonetheless, they can disrupt the vaccination process.

Methods and Materials

This research used quantitative data to answer the research questions. *Quantitative data* is defined as the value of data in the form of counts or numbers where each data set has a unique numerical value associated with it. This research employed an explanatory cross-sectional web research design. The Statistical Institute of Jamaica (2022) statistics revealed that Jamaica's human population was *2,734,092* as at the end of 2019. Using the previously mentioned population size and a confidence interval of 95% with a margin of error of *2.98%*, the sample size was determined to be 1,082 Jamaicans. The responses for this research were gathered using convenience sampling because of the protocols established by the Jamaican government relating to the Coronavirus 2019 (COVID-19), such as social distancing and quarantines. Responses that would be considered valid were from individuals 18 years old and older living inside Jamaica. In comparison, answers that would be regarded as invalid included those under 18 years and individuals living outside of Jamaica. Data collection for this research occurred from September 24, 2021 to December 10, 2021.

Before the data was collected from the participants, a research team trained in research methods, particularly data collections, was assembled. They had to complete a course in Ethics offered by The Global Health Network. The research entailed data collection from the participants across all three counties in Jamaica: Cornwall, Middlesex and Surrey. Cornwall county consists of Trelawny, Hanover, St James, St Elizabeth, and Westmoreland. Middlesex county consists of Manchester, Clarendon, St Catherine, St Ann and St Mary. The county of Surrey consists of Portland, Kingston, St Andrew and St Thomas. Researchers were assigned different counties, and they sought to collect data across the other geographic areas as specified by the Statistical Institute of Jamaica on the number of people living in each parish (Statistical Institute of Jamaica, 2022).

Participants were informed about the aim and purpose of the study. The questionnaire consisted of questions that did not pose a threat or imperil to participants. Researchers used Google Forms to create the survey questionnaire containing fifteen close-ended questions. Tables, graphs and

percentages displayed the data for further analysis. The survey distribution to individuals occurred via WhatsApp, Instagram, and Facebook via social media platforms and in person. Data analysis occurred using the Statistical Packages for the Social Sciences (SPSS) 25 for Windows 27.0. The statistical tools were descriptive statistics, cross-tabulations, and binary logistic regression, and a p-value of 5% was used to determine the level of statistical significance.

Findings

Table 1 represents the sampled respondents' demographic characteristics (n=1080). The majority of the sampled respondents were females (57.7%, n=623), lived in Clarendon (20%, n=216) and ages 18-27 years old (40.9%, n=442).

Table 1.Demographic Characteristics of the Sampled Respondents, n=1,080

Details	**% (n)**
Gender:	
Female	57.7 (623)
Male	42.3 (457)
Age Cohort:	
18-27	40.9 (442)
28-37	20.6 (223)
38-47	19.4 (209)
48-57	13.5 (146)
58 and over	5.6 (60)
Area of Residence(i.e., Parishes):	
Kingston and St Andrew	17.4 (188)
St Thomas	2.4 (26)
Portland	2.7 (29)
St Mary	3.2 (35)
St Ann	3.1 (33)
Trelawny	1.9 (20)
St James	2.9 (31)
Hanover	2.9 (31)
Westmoreland	1.7 (18)
St Elizabeth	19.7 (213)
Manchester	12.2 (132)
Clarendon	20.0 (216)
St Catherine	10.0 (108)
	17.4 (188)

Table 2 represents Jamaican's perceptions on needles. Of the sampled respondents, majority of them responses are as follows: “they are ok I don't have a problem with them” (37.2%, n=402), “Do you like taking medication in the form of injections?” Most of the responses were no (62.6%, n=676), how fearful are you of needles on a scale of 1-5 with 5 being the highest level of the fear majority of the responses was 3(31.2%, 337), If the needles were shorter would you take

the vaccine? The most response was Yes (43.6%, 471). Does this statement refer to you; 'My heart races when I think about getting an injection' majority of the responses agreed (31.9%, n=344). Have you ever avoided medical treatment because you knew needles would be involved? Most answers to that question were No (48.0, n=518). Do you believe you will overcome the fear of needles and take the vaccine?(Vaccines in general) Yes, I thinkI had the most responses (34.7% n=375)

Table 2.Respondent's perception on needles/injections, n=1,080

Details	**% (n)**
Like taking medication in the form of injection	
Yes	37.4 (404)
No	62.6 (676)
Perspectives on needles	
They are okay I don't have a problem with them	37.2 (402)
I'm a bit scared of them	32.3 (349)
They make me feel nervous	22.0 (238)
They are too big	8.4 (91)
Degree on fearful of needles (scale of 1-5, with 5 being the highest level of fear)	
1 – the least	17.6 (190)
2	15.8 (171)
3-moderate	31.2 (337)
4	20.5 (221)
5 – the most	14.9 (161)
If the needles were shorter would you take the vaccine?(Vaccines in general)	
Yes	43.6 (471)
No	36.2 (391)
Not Applicable	20.2 (218)
If the vaccine was an oral substance would you take it?	
Yes	60.8 (657)
No	39.2 (423)
Does this statement refer to you; 'My heart races whenever I think about getting an injection'	
Strongly disagree	31.9 (344)
Disagree	20.1 (217)
Neutral	22.2 (240)
Agree	15.1 (163)
Strongly Agree	10.7 (116)
Have you ever avoided medical treatment because you knew needles would be involved?	
Yes	40.0 (432)
Maybe	12.0 (130)

No	48.0 (518)
Do you believe you will overcome your fear of needles and take the vaccine?(Vaccines in general)	
Yes I believe	34.9 (375)
I don't fear needles	27.9 (300)
I believe a little bit	21.6 (232)
No I don't believe	15.5 (167)

Of the sampled respondents (n=1,080), 69.4% of them indicated that they had considered taking the COVID-19 vaccine (Table 3). There is a preference of having medical doctors giving the injections (52.4%) compared to nurses (47

Table 3.Issues on COVID-19 Vaccines, n=1,080

Details	**% (n)**
Have you considered taking the COVID-19 vaccines?	
Yes	69.4 (750)
No	30.6 (330)
Who would you rather administer the vaccine to you?	
Nurse	47.6 (341)
Doctor	52.4 (375)

H_0: *No statistical relationship exists between the fear of needles and considering taking the COVID-19 vaccine*

Table 4 presents a cross-tabulation between the fear of needles and considering taking the COVID-19 Vaccine. Using chi-square analysis, the data revealed that a statistical association emerged between the two variables above*($\chi 2(4)=50.908, P < 0.001$)*. Hence, the null hypothesis is rejected. Furthermore, 84.7% of those who indicated having the slightest fear of needles had considered taking the vaccine compared to 52.2% of those who stated the most fear of needles (Table 4).

Table 4.A cross-tabulation between the fear of needles and considering taking the COVID-19 Vaccine, n=1,080

Details		**Rating the fear of needles (On a scale of 1-5, with 5 being the highest level of fear)**					**Total**
		1	**2**	**3**	**4**	**5**	
Considered taking vaccines		**% (n)**	**% (n)**	**% (n)**	**% (n)**	**% (n)**	**% (n)**
	Yes	84.7 (161)	68.4 (117)	65.3 (220)	76.0 (168)	52.2 (84)	69.4 (750)
	No	15.3 (29)	31.6 (54)	34.7 (117)	24.0 (53)	47.8 (77)	30.6 (330)
Total		190	171	337	221	161	1,080

H_0: *There is no statistical association between considering being vaccinated against COVID-19 and preferring oral vaccines.*

Table 5 presents a cross-tabulation between considering being vaccinated against COVID-19 and preferring oral vaccines. The Chi-square test revealed that there is a statistical relationship between the two variables above*[$\chi^2(1)=128.458$, $P < 0.001$]*. Hence, this study rejects the previously mentioned hypothesis. *82.2%* of those who prefer oral vaccines are more likely to consider being vaccinated against COVID-19 than those who do not have an oral vaccination preference *(49.6%)*.

Table 5.A cross-tabulation of considering being vaccinated against COVID-19 and prefer oral Vaccines, n=1,080

Details		**Prefer Oral Vaccine**		**Total**
		No	**Yes**	
Considering Being vaccinated against COVID-19:		**% (n)**	**% (n)**	**% (n)**
	No	50.4 (213)	17.8 (117)	30.6 (330)
	Yes	49.6 (210)	82.2 (540)	69.4 (750)
Total		423	657	1,080

H_0: *Males are more likely to fear needles than females.*

The Chi-square test revealed no statistical association between the gender of respondents and the fear of needles [$\chi^2(4)=3.674$, $P = 0.452$]. Therefore, this study fails to reject the hypothesis above (Table 6).

Table 6.A Cross-tabulation between the Fear of needles and Gender, n=1,080

		Gender		**Total**
		Female	**Male**	
Details		**% (n)**	**% (n)**	**% (n)**
Rating the Fear of Needles				
	1-the least	16.2 (101)	19.5 (89)	17.6 (190)
	2	15.4 (96)	16.4 (75)	15.8 (171)
	3	31.1 (194)	31.3 (143)	31.2 (337)
	4	21.0 (131)	19.7 (90)	20.5 (221)
	5-the most	16.2 (101)	13.1 (60)	14.9 (161)
Total		623	457	1,080

H_0: *Older respondents are less likely to fear needles than younger respondents.*

Using the Chi-square test, a significant statistical relationship emerged between the rating of the fear of needles and age cohort [χ^2 (16) =50.509, $P < 0.001$; Table 7]. Furthermore, the null hypothesis is rejected as younger respondents (25.3%) are less likely to fear needles than older respondents (11.7%).

Table 7.A cross-tabulation of rating the fear of needles and age Cohort, n=1,080

		Age Cohort (in years)					Total
		18-27	28-37	38-47	48-57	58+	
Details							
Rating the fear of needles		**% (n)**	**% (n)**	**% (n)**	**% (n)**	**% (n)**	**% (n)**
	1-the least	25.3 (112)	13.0 (29)	12.0 (25)	11.6 (17)	11.7 (7)	17.6 (190)
	2	18.1 (80)	14.8 (33)	17.7 (37)	11.6 (17)	6.7 (4)	15.8 (171)
	3	24.2 (107)	35.4 (79)	36.8 (77)	36.3 (53)	35.0 (21)	31.2 (337)
	4	17.6 (78)	22.4 (50)	20.6 (43)	22.6 (33)	28.3 (17)	20.5 (221)
	5-the most	14.7 (65)	14.3 (32)	12.9 (27)	17.8 (26)	18.3 (11)	14.9 (161)
Total		442	223	209	146	60	1,080

Modelling Vaccination Status

H_0: *Preferred oral vaccine, the healthcare personnel who will administer the vaccine, gender, the fear of needles, and age of respondents are not factors of the vaccination status of Jamaicans.*

$$V = f(O, H, G, F, A) \quad \text{Eqn. [1]}$$

Where *V* denotes vaccination status (*1=yes, 0=no*), *O*isthe preferred oral vaccine, *H*symbolizes the healthcare personnel administering the vaccine, *G* denotes gender, *F* means the fear of needles, and A isthe age of respondents**.** Of the number of cases (*1,080), 66.3%(n=716)* were used to the binary logistic regression model. Overall, *72.9% (n=522)* of the valid cases *(n=716)* were correctly classified: *88.6%* of the vaccinated cases *(n=451)*, and *34.3%* of the non-vaccinated cases.

Table 8 presents a binary logistic regression of the vaccination status of Jamaicans by selected explanatory variables. Of the five variables entered in Eqn. [1], three emerged as factors of the vaccination status of Jamaica.

The three factors (age, fear of needles, and accept oral vaccination) accounted for 21.6% (i.e., Nagelkerke R^2) of the variance in vaccination status (-2Ll=744.023; Omnibus test of Model coefficients: $\chi^2(8)=117.109$, $P < 0.001$; Hosmer and Lemeshow test: $\chi^2(8)=10.750$, P-value = 0.216).

Furthermore, the most crucial factor influencing respondents' decision to be vaccinated against COVID-19 is oral vaccinations (Wald statistics = 80.315) followed by fear of needles (Wald statistics = 20.100), and then the age of respondents (Wald statistics = 8.905). In addition, the findings revealed that respondents who preferred oral vaccines were 5.3 times more likely to consider vaccination across COVID-19 compared to those who have a non-oral vaccine

preference. Furthermore, respondents who fear needles were 0.295 times less likely to consider being vaccinated against COVID-19. Those ages 38-47 were less likely to consider vaccination against COVID-19 than respondents 18-27 years.

Table 8.Binary logistic regression of vaccination status of Jamaica by selected explanatory Variables

Explanatory variable	B	S.E.	Wald	P-value	OR	95% C.I.
						Lower-Upper
Prefer OralVaccines (1=Yes)	1.677	.187	80.315	<0.001	5.347	3.706-7.715
NurseAdminister (1=Yes)	0.193	0.186	1.083	0.298	1.213	0.843-1.747
Female	0.119	0.186	0.412	0.521	1.126	0.783-1.621
Rating the fear of needles	-0.349	0.078	20.100	<0.001	0.705	0.605-0.821
Age2 (28-37 years)	-0.224	0.256	0.769	0.381	0.799	0.484-1.319
Age3 (38-47 years)	-0.737	0.247	8.905	0.003	0.479	0.295-0.777
Age4 (48-57 years)	-0.220	0.288	0.584	0.445	0.803	0.457-1.411
Age5 (58+ years)	-0.620	0.389	2.534	0.111	0.538	0.251-1.154
Reference group (18-27 years)	1.000					
Constant	1.198	0.318	14.164	<0.001	3.312	

***OR** denotes the odds ratio*

Discussion

The initiative and acceptance rates for vaccination against the COVID-19 has shown variation in various countries (Holder, 2021; Johns Hopkins University and Medicine, 2021; Petterssonet al., 2021). This research established that *"trypanophobia-the fear of needles*"-is contributing to vaccination hesitancy in Jamaica, which concurs with current literature (Brown & Gopal, 2021; Freemanet al., 2021; McMurty, 2021; Sierzega, 2021; Smith, 2021; U.S. Department of Health & Human Services, 2021; Wright et al., 2009). Results of this survey revealed that most of the respondents, 62.6%, said "no" to the question *"Do you like taking medication in the form of injection."*Another question was,*"If the vaccine was an oral substance would you take it?"*The majority of the respondents (60.8%) said *"Yes"*. On whether they would take the vaccine if offered as an oral substance, 60.8% indicated "Yes" of the sampled respondents.

One of Jamaica's leading public health and ageing experts recognized "*trypanophobia-the fear of needles*"-as one of the significant factors causing several Jamaicans to refuse the COVID-19 vaccine" (Lyons, 2021).The current study does not justify Eldemire's postulation. The three factors (age, fear of needles, and accept oral vaccination) accounted for 21.6% (i.e., Nagelkerke R^2) of the variance in vaccination status. Still, the fear of needles contributes to COVID-19 vaccination hesitancy among Jamaicans. Furthermore, the extent of *trypanophobia* among Jamaicans is pervasive, positively influencing COVID-19 vaccine hesitancy. According to Fritscher (2021), *trypanophobia* is "*the extreme fear of medical procedures involving injections or hypodermic needles*", a psychological phenomenon influencing people's behaviour in this COVID-19 era. The extent of *trypanophobia* among Jamaicans is reflected in the question, *"If the needles were shorter, would you take the vaccine? 43.6% of the current sampled respondents*

indicated yes to the matter. The following findings are some more issues that can emphasize trypanophobia among Jamaicans. When the respondents were asked, *"What are your thoughts on needles?"*the majority of them indicated that *"They are okay, I don't have a problem with them" (37.2%), 32.3% stated that 'I'm a bit scared of them, 22.0% remarked 'It makes me feel nervous, and 8.4% mentioned that "they are too big"*.

This research revealed that regarding the question "*Does this statement refers to you, my heart races when I think about getting an injection?" the majority of the respondents agreed 31% (344), strongly agreed 20.1% (217), neutral 22.2% (240), disagreed 15.1% (163) and strongly disagreed with 10.7% (116).* The current study revealed that fear of needles is an issuethat influences vaccine hesitancy amongst individuals in Jamaica. This finding was evident from the research question, *"Do you believe you will overcome the fear of needles and take the vaccine? Yes, I Believe, 34.7 (375), I don't fear needles, 27.8 (300) I believe a little bit, 21.5 (232) No, I don't believe15.5 (167). When asked the current question, "Have you ever avoided medical treatment because you knew needles would be involved?"the majority of respondents were "No" with 48.0% (n=518) while 12.0% (n=) responses were maybe"*.

Freeman et al. (2021) provided empirical evidence that *trypanophobia* negatively influences COVID-19 vaccine hesitancy among a sample of 15 014 UK adults (18+ years), which supports this current study. This study provided a cross-tabulation of the rating of *trypanophobia* and vaccination status of Jamaicans. This research revealed that among those with less *trypanophobia*, *84.7%* of them indicated that they are considering taking the COVID-19 vaccines compared to 68.4% of those with the second least amount of anxiety and *52.2%* of those with the highest degree of fear of needles. The reality is that *32.5%*fewer respondents indicated that they are considering not taking the vaccine based on the two extremes of the *trypanophobia*scale. Conclusively, Jamaicans are delaying taking the vaccine because of trypanophobiawhich is supported by a similar study conducted in Canada (McMurty, 2021), the United Kingdom (Brown & Gopal, 2021; Freemanet al., 2021), and in the United States (Appleby, 2021).

Previous research indicated that *trypanophobia* affects at least 10% of the population (Hamilton, 1995; McLenon& Rogers, 2019; Malcolm, 2016), which supports findings here in Jamaica as 14.9% of people are influenced by extreme *trypanophobia*, and another 20.5% are also fearful of needles but not to the degree of the 15%. Love & Love (2021) found that 11.2% of the adult population suffers from t*rypanophobia*, which is marginally higher in Jamaica, particularly among the elderly. According to Hamilton (1995), *"Because persons with needle phobia typically avoid medical care, this condition is a significant impediment in the health care system"* (p.165). This insight provides some context on the rates of COVID-19 vaccine hesitancy in Jamaica.

Consequently, t*rypanophobia* exists across cultures and geopolitical zones across the world(Carey & Harris, 2005; Carmin, 2019; Davis, et al., 2013; Legg,2018; McLenon& Rogers, 2019; National Library of Medicine, 2021), which makes the situation a normal occurrence in Jamaica. Some had articulated this fear through their avoidance of the doctors, especially when they needed blood tests or the dentist when they needed a filling (Loopnews, 2017). *Trypanophobia* is, therefore, a barrier to good health practices, healthy lifestyle choices, and

vaccination among global citizens, which accounts for the high vaccine hesitancy among Jamaicans. Healthcare providers have an opportunity to empower patients in an attempt to promote self-care if they struggle with *trypanophobia*.

Conclusion

Individuals from the 14 parishes of Jamaica from ages 18+ years took part in this survey with 1080 respondents. The majority of survey participants were females (57.7%) between 18- 27 years old (40.9%) residing in Clarendon. Across-tabulation yielded a critical value less than the chi-square, resulting in the rejection of the null hypotheses. Therefore a statistically significant relationship exists between all age groups and the level of fear for needles. The results suggest that individuals can have *trypanophobia* at any age but more so in the elderly. Therefore, *trypanophobia* affects Jamaicans' willingness to be vaccinated. The preferred option for an oral vaccine, the fear of needles, and the age of respondents were emerging factors influencing the vaccination status of Jamaicans.

Recommendations

Within the context of *trypanophobia* experienced by Jamaicans and its direct influence on vaccine hesitancy, this study is recommending the following: *1) re-examine the terminologies used in the COVID-19 vaccination campaign to facility vaccine acceptance among those who fear needles; 2) the government should invest in oral medications for those who are experiencing trypanophobia, and 3) policymakersshould train and deploy special medical personnel for the vaccination of those who experience trypanophobia.* A positive healthcare provider and patient interaction are pivotal in increasing the patient's confidence; willingness toward treatment and the strength to overcome trypanophobia" (Starr & Poole, 2016).

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