# RELIGIOSITY AND HEALTH LOCUS OF CONTROL AS PREDICTORS OF COVID-19 VACCINE HESITANCY AMONG UNDERGRADUATES OF BENUE STATE UNIVERSITY MAKURDI

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**Abstract**

Coronavirus disease 2019 (COVID-19) vaccine hesitancy refers to a delay in acceptance or refusal of the vaccines despite the availability of vaccination services. A good number of COVID-19 vaccines are in circulation for use in Benue State but the extent of its utilization and associated factors among undergraduate students is unknown. The purpose of this study was to determine if religiosity and health locus of control predict COVID-19 vaccine hesitancy among undergraduate students of Benue State University, Makurdi. A correlation design was used and stratify sampling was employed to select 120 respondents from faculty of social sciences. Data were collected using three standardized scales. Data were analysed using multiple regression and independent t-test. The results of hypothesis one revealed that organizational religiosity (β=.189; P<.05) and Intrinsic/subjective religiosity (β=.280; P<.01) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University Makurdi, F(3,116) = 4.729; P<.01]. It was also revealed that Internal health locus of control (β=.271; P<.01); powerful others health locus of control (β=.327; P<.01) and chance health locus of control (β=.223; P<.05) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University. Further analysis showed that religiosity and locus of control jointly predicted COVID-19 vaccine hesitancy.The study concluded that religiosity with health locus of control appears to have impact in the decision to be inoculated with the COVID-19 vaccine. There is therefore need for guidelines for implementing targeted public health campaigns to increase vaccine uptake among religious dominated students in the University campus.

**Key Words:**Religiosity, Health Locus of Control, and COVID-19 Vaccine Hesitancy

**Introduction**

COVID-19 pandemic has ravaged humanity since its inception, recording deaths and survivors. COVID-19 vaccine has been framed as the ultimate solution needed for the pandemic. Religiosity and Health Locus of Control have played majors role in acceptance of this vaccine. A substantial number of vaccines are in circulation as protective measures against the pandemic but the extent of its utilization is unknown in Benue State especially among undergraduate students of BenueState University due to vaccine hesitancy.

WHO (2019) defines vaccine hesitancy as a delay in acceptance or refusal of vaccines despite the availability of vaccination services. It is a continuum ranging from complete acceptance to complete refusal. According toMacDonald& The SAGE Working Group on Vaccine Hesitancy (2015), evidence suggests that the public health benefits of approved COVID-19 vaccines will be undermined by hesitancy from populations to be vaccinated. Vaccine hesitancy is primarily driven by people's exposure to misinformation and that this can be countered by 'inoculating' publics with facts. While vaccines are celebrated as one of the most successful public health measures, an increasing number of people believe vaccines are either unsafe or unnecessary (El-Elimat, et al., 2021).Thisis considered a growing threat to the success of vaccination programmes as vaccine coverage rates are decreasing globally.

Vaccine hesitancy is influenced by a number of factors including issues of confidence (do not trust vaccine or provider), complacency (do not perceive a need for a vaccine, do not value the vaccine), and convenience (access).Additional behavioural factors may shape vaccine uptake, including complacency (perception of risk, severity of disease), sources of information, socio-demographic characteristics, people's level of commitment to risk culture and their level of confidence in health authorities and mainstream medicine. In addition to these factors, religiosity and health locus of control have played a major role in acceptance of COVID-19 vaccine.

Religiosity refers to the various dimensions associated with religious beliefs and involvement. According to Adeyemo and Adeleye (2008), religiosity includes having belief in, reverence for God or a deity, as well as participation in activities in that faith, such as attending service/ worshipping regularly and participating in other social activities with one's religious community. They are three dimensions of religiosity. The first isOrganizational religious activity (ORA) which involves public religious activities such as attending religious services or participating in other group-related religious activity (prayer groups, Scripture study groups, *etc*.). Second is non-organizational religious activity (NORA) and this consists of religious activities performed in private, such as prayer, Scripture study, watching religious TV or listening to religious radio. The third is intrinsic religiosity (IR) which is related to degree of personal religious commitment or motivation. During stressful life events, adversities, and uncertainties like COVID-19, religion offers a source of relief as a means for coping with

uncertainty (Algahtani, et al.,2022). Religious coping involves relying on one's faith, not just for refuge and comfort, but also for possible explanations. Nigerians and people of Benue State are very religious people and it is important to assess the role religiosity plays in their COVID-19 vaccine decision. Empirical evidence suggests that during tragic events, much emphasis is placed on prayer, scripture readings, and closeness to God as the way out of the crisis (Pargament 2004; Keisari, et al., 2022).

Previous studies have shown that religiosity is a strong predictor of anti-vaccine beliefs. For example, Olagoke, et al. (2021) found a significantly negative association between religiosity and COVID-19 vaccination intention. In another study among American Muslim physicians in the USA, Mahdi et al. (2016) found that respondents who sought bioethical guidance from Islamic laws had lower odds of recommending porcine-based flu vaccination to their patients. Wester, et al., (2022) studied Prayer frequency and COVID-19 vaccine hesitancy among older adults in Europe and found that respondents were likely to be vaccine-hesitant when praying weekly or less.Lucia, et al., (2020)'s study found that religious teachings prioritize prayers over medicine, thus resulting in vaccination hesitancy among devotees. Similarly, Baffour-Awuah (2022) has established the growth of vaccine hesitancy among the Ghanaian populace. It was reported that religious leaders, when compared with all categories of prioritized populations sampled for the survey, had a high hesitancy rate. Some 57 percent of religious leaders sampled would not accept the vaccine. In addition to religiosity, health locus of control could affect vaccine utilization.

Health locus of control (HLOC) is a construct representing the degree to which individuals perceive reinforcing events in their lives to be the result of their own actions (an "internal" HLOC) or fate (an "external" HLOC) (Bandura, 1986; Rotter, 1966). It refers to the notion that people view life either as something they can control or something that controls them. People generally have either an internal locus of control or an external locus of control. It may also be possible that people operate with an internal locus of control in some areas of life, while operating from an external locus of control in other areas. Research suggests that people who operate with an internal locus of control are more successful in work and life-enjoying better health, relationships and personal and professional growth.

HLOC is recognized as one of the factors that can explain health promotion behaviour like vaccination. Grotz et al. (2011)found that high internal HLOC is associated with health promotion behaviour like vaccine acceptance whereas Steptoe & Wardle(2011) found that external HLOC, particularly belief in powerful others, may explain preventive and health promotion behaviour. Other studies suggest that HLOC is a complex issue and only interaction between internal and external factors can explain one's health behaviour. Wallston (2005) emphasizes that perception of HLOC depends on the situation, that it is a general orientation of health behaviour, and that each individual will behave differently in each situation. These Studies have found inconsistent results

and were mostly carried in non- student population, there is therefore need to ascertain association of religiosity and health locus of control on vaccine hesitancy among undergraduates of Benue State University.

Aside religiosity and health locus of control, sex and gender are also important factors in understanding immunisation, including vaccine hesitancy (Heidari& Goodman, 2021). Sex and gender differences in immunisation outcomes have been observed across agegroups for other vaccine preventable diseases, with women typically developing higher antibody responses, and reporting more local and systemic adverse reactions, compared with men (Fischinger, et al., 2019). In a systematic and meta-analytic review, Zintel, et al., (2022) found that majority (58%) of papers reported men to have higher intentions to get vaccinated against COVID-19. Meta-analytic calculations from same study showed that significantly fewer women stated that they would get vaccinated than men. Similarly, Galanis, et al., (2020) also found that male gender was associated with increased health workers willingness to get vaccinated against COVID-19.

**Statement of the Problem**

The novel 2019 coronavirus (COVID-19)COVID-19 has caused global pandemic that led to a dramatic loss of human life worldwide (Shereen, et al., 2020). COVID-19 has spread to over 180 countries (WHO 2020). As of November 23, 2022, there has been a report of 635,709,158 confirmed cases and 6,603,803 deaths globally, with the USA leading in the number of cases (WHO, 2022). The devastating impacts of this pandemic on lives, healthcare systems, social wellbeing, and the economy have led to the introduction of several mitigating measures such as regional lockdown, hygiene promotion, social distancing, travel restrictions, and mass vaccination (Wilder-Smith & Freedman 2020).

Now different vaccines have been rolled out for more than a year now. The World Health Organization has approved safe and effective use of the following vaccine as of April 2021: Astra Zeneca / Oxford vaccine, Johnson and Johnson, Moderna and Pfizer / BionTech vaccine. The importance of mass vaccination is that it helps to achieve herd immunity but not many people arewilling to take the jab due to many factors including religious reasons and the belief that the control of COVID-19 is outside their power (external)or within their control (internal). Vaccine hesitance poses a challenge to achieving herd immunity. If a sufficient number of people in a population reject vaccination and herd immunity is not achieved, the virus will continue to circulate among susceptible individuals, including those who are unable to be vaccinated for medical reasons (Kerr,et al., 2021). Benue State is a religious state, dominated by Christians. Evidence shows that religiosity and health locus of control play vital roles in critical moments of life and that these beliefs are associated with clinical outcomes. However, further studies are needed to assess these beliefs during the COVID-19 pandemic. It is therefore important to understand whether religiosity and health locus of control predict COVID-19 vaccine hesitancy among undergraduates of Benue State University.

**Aim and Objectives of the Study**

The aim of this study is to examine religiosity and health locus of control as predictors of vaccine hesitancy among undergraduates of Benue state University. Specific objectives of this study are to:

I. Examine if religiosity will be a predictor of vaccine hesitancy among undergraduates of Benue state University.
II. Ascertain the extent to which health locus of control will predict vaccine hesitancy among undergraduates of Benue state University.
III. Investigate the extent to which religiosity and Health locus of control will jointly predict vaccine Hesitancy among undergraduates of Benue state University.
IV. To determine if sex differences exist in vaccine as regard vaccine hesitancy among undergraduates.

**Research Questions**

This study will attempt to provide answers to the following research questions:

I. To what extent will religiosity predict vaccine Hesitancy among undergraduates of Benue state University?
II. Will Health locus of control predict vaccine Hesitancy among undergraduates of Benue state University?
III. To what extent will religiosity and Health locus of control jointly predict vaccine Hesitancy among undergraduates of Benue state University?
IV. They will be significant sex differences in vaccine hesitancy among undergraduate students of Benue State University.

**Hypotheses**

The following hypotheses were tested.

I. Religiosity will significantly predict vaccine hesitancy among undergraduates of Benue state University.
II. Health locus of control will significantly predict vaccine hesitancy among undergraduates of Benue state University
III. Religiosity and health locus of control will significantly predict vaccine Hesitancy among undergraduates of Benue state University.
IV. There will be significant sex differences in vaccine hesitancy among undergraduate students of Benue State University.

**Methods**

**Design**

The study is a survey research withcorrelational research design. The choice of correlational research design was because the researcher was primarily interested in establishing the relationship between religiosity, health locus of control and vaccine hesitancy among undergraduates of Benue State University.

**Instruments**

**Multidimensional Health Locus of Control Scale**

Multidimensional Health Locus of Control (MHLC) Scale (Form A) was used to assess health locus of control in the respondents.

The scale was developed by Wallston, Wallston, Kaplan, &Maides, (1976) to assess the degree to which an individual believe or feel that they are in control of their own Health. The form A of the multidimensional health locus of control has 18 items with three subscales. They are Internal Health Locus of Control, Powerful Others Health Locus of Control, and Chance Health Locus of Control. Each of the three subscales contains six items with a six-point Likert response scale ranging from 1= 'Strongly Agree' to 6 = 'Strongly Disagree'. The subscales are scored by summing respective items for a total scale score. **Internal items:** 1, 6, 8, 12, 13, 17. **Chance items:** 2, 4, 9, 11, 15, 16 and P**owerful others items**: 3, 5, 7, 10, 14, and 18. Chance and powerful others are collectively called external locus of control. Higher scores reflect stronger endorsement of MHLC scales. For instance: If I get sick, it is my own behaviour which determines how soon I get well again, (1=strongly disagree, 2=moderately disagree, 3=slightly disagree, 4=slightly agree, 5=moderately agree, 6=strongly agree).The scale has been used literally in hundreds of studies *(*Wallston, 2005**).** Moshki, Ghofranipour, Hajizadeh, &Azadfallah, (2007) obtained the Validity and reliability of the multidimensional health locus of control scale using college students. It showed a *test –retest r*eliability **of** 0.60 ($p < 0.001$(Internal), 0.58 ($p < 0.002$ (Chance), and 0.74 ($p < 0.0001$(Powerful others). The same study revealed a concurrent validity of 0.57 for Internal ($P < 0.001$), 0.49 for Powerful Others ($P < 0.01$), and 0.53 for Chance ($p < 0.001$).

**The Oxford COVID-19 Vaccine Hesitancy Scale**

The Oxford COVID-19 Vaccine Hesitancy Scale was developed by Freeman, Loe, Chadwick, Vaccari, Waite, Rosebrock, Jenner, Petit, Lewandowsky, Vanderslott, Innocenti, Larkin, Giubilini, Yu, McShane, Pollard, &Lambe, (2020). The scale is a seven-item measure that assesses intention to received Covid-19 Vaccine. Item specific response options, coded from 1 to 5, are used. A 'Don't know' option is also provided, but is excluded from scoring. For example: would you like to take Covid-19 vaccine (approved for use in the UK) if offered. Responses ranges from definitely, probably, I may I may not, probably not, definitely not to don't know. Higher scores indicate a higher level of vaccine hesitancy. The Cronbach's alpha is 0.97, indicating that the scale is reliable and can be used for this study.

**Duke University Religion Index(DUREL)**

DUREL is a five-item scale that assesses the three major dimensions of religious involvement. These are organizational, non-organizational,and intrinsic or subjective religiosity. The DUREL is designed to measure religiosity in Western religions (e.g., Christianity, Judaism and Islam). The scoring of the DUREL is particularly important both for analysis purposes and forinterpretation of results. `Subscale´ question 1 is the first question in the DUREL and it measures Organizational religious activity (ORA). `Subscale´ question 2 measure Non-organizational religious activities (NORA). Subscale 3 consists of the final three items that assess intrinsicreligiosity (IR). It is not recommendedto sum all three `subscales´ into a total overall religiosityscore except 3-5

that assess intrinsic religiosity. Instead, each subscale should be examined and scored independently.

**Participants**

A total of 1224 students of200level from the five departments of faculty of social sciences for 2020/2021 academic session formed the population of the study. A stratified sampling technique was adopted to select sample of 120 participants from the five departments in the faculty of social sciences of Benue State University. Stratified sampling technique was preferred because it gives the researchers the opportunity to select participants from different strata (departments) to provide answers to the research questions. The sample size was derived using the Krejcie, & Morgan (1970) sample size calculation table. Inclusion criteria was that participants must be undergraduates, 18 years and above, in any of the five departments of the social science faculty, must be in 200 level and have not received the COVID-19 vaccine. Exclusion criteria include post graduate students, Lecturers, persons under 18 years, those in other faculties and those that have already received the COVID-19 vaccine.

**Procedure**

During the administration of the questionnaires, the researchers met respondents in the selected departments. Upon arrival, the researchers briefly explained the purpose of the study to them including necessary information needed to complete the questionnaire and seek their consents to participate in the study.After signing the consent form, they were administered copies of research questionnaire. Participation was optional and participants were free to withdraw their participation any time. After completing the questionnaires, the researchers appreciated participants for their participation, assured them of confidentiality of the information provided and left their contact details behind should any of the participants wants to make clarifications or further enquiry about the study.

**Data Analysis**

The data collected were analysed using Descriptive Statistics and multiple regression and independent t-test. A statistical package for social sciences (SPSS) was used for all the analysis.

**Testing of Hypotheses**

In testing of the research hypotheses for the study, multiple regression analysis and independent t-test were used.

**Hypothesis one** stated that the three dimensions of religiosity (Organizational, non-organizational and intrinsic) will significantly predict COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi and the result is presented below:

**Table 1.0:** Multiple regression summary scores showing prediction of Religiosity on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi

| Predictor variable | R | $R^2$ | Df | F | ? | t | Sig |
|---|---|---|---|---|---|---|---|
| Constant | .330 | .109 | 3<br>116 | 4.729 | | 3.098 | .002** |
| Organizational | | | | | .189 | 2.048 | .043* |
| Non-Organizational | | | | | .056 | .610 | .543 |
| Intrinsic | | | | | .280 | .3.173 | .002** |

****P<.01; *P<.05**

Results in Table 1.0 above revealed that organizational religiosity (β=.189; P<.05) and Intrinsic/subjective religiosity (β=.280; P<.01) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University Makurdi, F(3,116) = 4.729; P<.01].This result implies that as the level of both organizational and Intrinsic religiosity increases, there is corresponding increase in the level of COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. However, Non-organizational religiosity (β=.056; P>.05) did not predict COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. More so, the result indicated that the overall religiosity accounted for 10.9% ($R^2$ = .109) total variance in explaining COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. Based on this result, the hypothesis one was confirmed.

**Hypothesis two** stated that the three dimensions of health locus of control (Internal, powerful others and chance) will significantly predict COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi and the result is presented below:

**Table 2.0:** Multiple regression summary scores showing prediction of health locus of control on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi

| Predictor variable | R | $R^2$ | Df | F | ? | t | Sig |
|---|---|---|---|---|---|---|---|
| Constant | .388 | .150 | 3<br>116 | 6.850 | | 9.774 | .000** |
| Internal | | | | | .271 | 3.113 | .002** |
| Powerful Others | | | | | .327 | 3.317 | .001** |
| Chance | | | | | .223 | 2.256 | .026* |

****P<.01; *P<.05**

Result from Table 2.0 above showed that all the three dimensions of health locus of control positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University Makurdi. Internal health locus of control (β=.271; P<.01); powerful others health locus of control (β=.327; P<.01) and chance health locus of control (β=.223; P<.05) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. This implies that as the level of internal, powerful others and chance health locus of control increases, there is corresponding increase in the level of COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. More so, the result further indicated that the overall health locus of control contributed 15.0% ($R^2$ = .150) total variance in explaining COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. Following the result therefore, hypothesis two was confirmed.

**Hypothesis three** sought to find out if religiosity and health locus of control will jointly predict COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi and the result is presented below:

**Table 3.0:** Multiple regression summary scores showing joint prediction of religiosity and health locus of control on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi

| Predictor variable | R | $R^2$ | Df | F | ? | t | Sig |
|---|---|---|---|---|---|---|---|
| Constant | .393 | .154 | 2<br>117 | 10.688 | | 13.007 | .000** |
| Religiosity | | | | | .230 | 2.705 | .008** |
| Health Locus of Control | | | | | .304 | 3.569 | .001** |

****P<.01; *P<.05**

Result in Table 3.0 above revealed that jointly, religiosity and health locus of control positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. This means that as the joint level of religiosity and health locus of control increases, COVID-19 vaccine hesitancy also increase among undergraduates of Benue State University, Makurdi. In addition, the result revealed 15.4 % ($R^2$ = .154) total variance in joint contribution of religiosity and health locus of control in explaining COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. Following the result therefore, hypothesis three was confirmed.

**Hypothesis four** stated that there will be a significant sex difference on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi and the result presented below:

**Table 4.0** Independent t-test summary table showing sex difference on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi.

| | Sex | N | × | SD | df | ? | ? |
|---|---|---|---|---|---|---|---|
| Vaccine Hesitancy | Male | 67 | 21.33 | 9.87 | 118 | 1.069 | >.05 |
| | Female | 53 | 23.28 | 10.04 | | | |

Table 4.0 showed that there is no significant sex difference on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi [t (1.069) =118; P>.05]. This implies that there is no significant difference between male and female on COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. The result further showed that male undergraduates scored lower mean [x = 21.33] on COVID-19 vaccine hesitancy. Following the result therefore, hypothesis four was not confirmed.

**Discussion**

The outcome of hypothesis one revealed that organizational religiosity (β=.189; P<.05) and Intrinsic/subjective religiosity (β=.280; P<.01) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University Makurdi, F(3,116) = 4.729; P<.01]. Non-organizational religiosity (β=.056; P>.05) however, did not predict COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. Findings on Non-organizational religiosity is contrary to the findings of Wester, et al., (2022) who found that respondents were likely to be vaccine-hesitant when praying weekly or less. The second hypothesis showed that all the three dimensions of health locus of control (internal, powerful others and chance locus of control) positively and significantly predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University Makurdi. These results largely cohere with the findings of Grotz et al. (2011) who found that high internal HLOC is associated with health promotion behaviour like vaccine acceptance and Steptoe & Wardle, (2011) who found that external HLOC, particularly belief in powerful others, may explain preventive and health promotion behaviour like vaccination acceptance. Hypothesis three revealed that religiosity and health locus of control jointly and positively predicted COVID-19 vaccine hesitancy among undergraduates of Benue State University, Makurdi. Hypothesis four revealed no significant sex difference in COVID-19 vaccine hesitancy.

**Conclusion**

In conclusion, the present study investigatesreligiosity and health locus of control as predictors of COVID-19 vaccine hesitancy among undergraduate students of Benue State University, Makurdi. Religiosity with health locus of control appears to have impact in the decision to beinoculated with the COVID-19 vaccine. Medical and scientifically sound evidence are influenced

by religious beliefs and personality factors resulting to different responses toward getting vaccination against the COVID-19. There is therefore need for guidelines for implementing targeted public health campaigns to increase vaccine uptake among religious dominated students in the University campus. The findings have significant public health implications for population experiencing COVID-19 vaccine hesitancy especially in a religious dominated state like Benue. Religious leaders have an important role in promoting public health during the COVID-19 pandemic. As pointed out by Olagoke et al., (2021), Government and religious leaders need to sensitize religious community members on their vital role top reserve their health by using faith-based justifications and scriptures. This may help decrease the external locus of control and increase perceived susceptibility to disease and engagement in preventive behaviours (such as vaccination).

**Limitations of Study**

Several limitations need to be considered when interpreting the results of this study. First is the small sample size. This will make the generalization of the findings beyond the study setting difficult. In addition, generalizability may be limited to the population with similar religious dimensions rather than affiliations or groups given that the association between religiosity and vaccine hesitancy is not the focus for any specific religion group (i.e., Islam, Christianity etc).

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