**The crossroads between science and faith: An analysis of prayer and participation in preventative measures against** **COVID-19**

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**Abstract**

Previous research on willingness to participate in preventative measures against illness is a well-researched topic, however, spirituality and religiosity within these concepts is not well documented. Hesitancy or lack of participation in various preventative measures poses a threat to the control of the SARS-CoV-2 (COVID-19) pandemic. To better understand the response to the COVID-19 pandemic, data was collected on what prayer means to individuals and how the use of prayer affects an individual’s participation in preventative measures such as wearing a face mask and washing hands through content analysis of open-ended question interviews. The use of prayer, spiritual or religious, may reflect views on learning styles (Cognitive and Affective). This revealed a preference toward certain types of messaging resources and ultimately leads to discussion of better messaging driven by the population.

Keywords: prayer, spirituality, religiosity, COVID-19, compliance, mitigation efforts, hesitancy, cognitive, affective

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The most often cited metric of COVID-19 mitigation activities worldwide is vaccination rates. While medical and religious exemptions allow some individuals to decline vaccination despite requirements by places of work or education, a vast percentage of the population (78.54 people out of 100) still had at least one vaccine (WHO, 2022). Since booster shots have become available, on April 14, 2022, only 28.99 out of every 100 people in the United States have received one (WHO, 2022). Khairat et al. (2022) suggest that lower levels of education are a major contributor to vaccine hesitancy and the overall vaccination metrics of a population in an area; thus, it becomes urgent to find a way to vaccinate these highly hesitant groups. Others (Sacerdotes & Glaeser, 2001) found that higher education has a negative relationship with religion at the denominational level. If lower education is associated with increased vaccination hesitancy and increased religiosity, it becomes paramount to understand how religious practices, such as prayer, influence an individual’s response to the impact of COVID-19. The aim of this study is to develop an understanding of what prayer means to individuals and how the use of prayer affects an individual’s response to the COVID-19 pandemic. These findings will provide information useful in the development of preventative measures tailored to members of the population who have differing values, making them more widely applicable and increasing participation in actions that aid in the prevention of widespread disease.

## Theoretical Perspective

Vaccine hesitancy has been shown to be driven by both cognitive and affective influences (Rief, 2021). Messaging related to vaccine compliance needs to respond to the learning needs of the intended audience. For instance, instead of focusing on future prediction, messages that balance information about risks and adverse effects and appeal to more altruistic motivations (i.e., protecting others) may have a greater impact.

The theoretical perspective guiding this study is Bloom’s Taxonomy of Leaning. The taxonomy classifies behaviors and feelings believed to be important to the process of learning. The taxonomy consists of the Cognitive Domain, Affective Domain, and Psychomotor Domain. The Cognitive Domain encompasses active thinking and judgement formation based on factual and acquired knowledge. The Affective Domain encompasses the ways in which people deal with things on an emotional level (e.g., values, motivations, attitudes, feelings). The Psychomotor Domain includes use of skills, techniques, and execution of procedures.

## Limitations

Robeson County encompasses a majority-minority population. Although, predominantly American Indian, other racial/ethnic/cultural groups include African-Americans, Latinx, and Caucasians. In addition, there is a wide range in educational achievement, religious affiliation, and financial status. These diverse influences may affect transferability of findings.

# Literature Review

The impact of prayer in healthcare is a topic with limited research due to the nature of the topic. Studies show that in the United States, many people turn to religious practices when facing tough times, such as illness (Koenig et al. 2001; Cummings & Pargament, 2010). It is important to note that studies have also found that when praying “the quality and conditions of the context matter because prayer can have both negative and positive effects” (Esperandio & Ladd, 2015, p. 671).

## Complementary and Alternative Medicine

Prayer tends to be grouped together with other forms of treatment termed complementary and alternative medicine (CAM) in the literature. Ayers and Kronenfeld (2010) analyzed various CAM modalities and their patterns of use to deduce through exploratory and confirmatory analysis that “prayer should be created as a separate domain and was thus apart from other mind-body treatments.” (p. 247) Prayer has been used in many different ways that are not mutually exclusive, including but not limited to: conversational (informal conversation with God), meditative (contemplating spiritual themes and relationships), ritual (reciting or reading prayers), and intercessory (petitions on behalf of others for health or wellbeing) (Jantos & Kiat, 2007). This typology shows that prayer is complex, both within and beyond the realm of religion, supporting the need for its own domain in complementary and alternative medicine. Prayer is often thought of as a supernatural phenomenon which makes quantifying it a complicated matter. It may be impossible, in fact, to assess for a placebo effect in double-blind studies (Jantos & Kiat, 2007).

## Quantifying Prayer

In seeking to quantify the effects of prayer on the brain, Harris et al. (2009) observed neural correlates of religious and nonreligious individuals when presented with statements that were true, false, and religious while using functional magnetic resonance imaging (fMRI). While religious and nonreligious thinking engaged different regions of the frontal, parietal, and medial temporal lobes, the difference between belief in the statements and disbelief in the statements appeared to be dependent on the content (i.e., an actual false statement vs. a religious statement).

## Perceived Efficacy

As for the perceived efficacy of prayer as it compares to conventional medicine, prayer is the most prevalent religious practice in the United States; 85% of Americans pray once a week or more and 55% of Americans engage in daily prayer (Ly et al. 2018). When comparing the two, “Although participants viewed prayer as more effective if conducted in social contexts and for others, in general prayer was viewed as less effective than conventional medicine overall.” (p. 13). However, prayer was perceived as being most effective at addressing psychological conditions, rather than acute or chronic.

## Prayer in Healthcare

Specifically in healthcare, nurses report feeling a lack of confidence in their ability to provide competent care for patients in spiritual distress. Pesut (2016) suggests that the *Theory-Theory Gap* may be to blame. This occurs when two concepts that are closely related to each other exist without clear delineation between the two. She suggests that this is occurring with spirituality and religion due to medical terminology separating the two when they tend to be intertwined (Pesut, 2016). Nurses are lacking vital information about spirituality and how to approach it within their scope of practice, so they do not approach it at all, leaving patients with care that lacks full competence. “Integrating our patients’ spiritual and religious beliefs into their health and mental health . . . treatment is empowering for them and creates a dynamic holistic perspective to CAT [Complimentary Alternative Treatment].” (Green, 2018, p. 1182). Research consistently finds that nurses had insufficient knowledge and skills related to spiritual care because of poor role preparation (Wu et al., 2016).

## Vaccine Hesitancy and Religiosity in a Rural Community

A qualitative study conducted in a rural area with strong religious values involving a survey on vaccine hesitancy and follow-up interviews found that a lack of knowledge and understanding about the effectiveness of vaccination, religious leaders emphasizing the use of prayer over medicine, a lack of privacy, and low levels of education were the main factors contributing to widespread vaccine hesitancy in this community. Machekanyanga et al. (2017) stress the importance of education used in conjunction with intervention from the government. It is also important that healthcare providers build important relationships with members of religious practices to enhance trust within the community.

# Research Methodology

This study involved secondary analysis of data from a CARES Act funded study designed to explore the prevalence of COVID-19 in a rural southeastern North Carolina population. The study was reviewed and approved by the University of North Carolina at Pembroke’s Institutional Review Board. All individuals who participated in the study met the inclusion criteria [minimum of 18 years old, non-symptomatic, no known exposure to COVID-19]. All participants submitted to a serology test for COVID-19 antibodies. A randomly chosen sub-set of participants also completed a brief survey that was designed to measure attitudes and beliefs that could impact their compliance with mitigation efforts and their attitudes toward vaccination following the first blood test (See Appendix A). Individuals were excluded if they were under the age of 18 or displayed active symptoms of COVID-19 or had knowledge of a previous exposure or infection.

## Inclusion/Exclusion Criteria

Subjects for the current study were drawn from the group in the original study who were tested and completed the surveys. Only those participants from the original study who met these criteria were included in the study described in this proposal.

## Recruitment

All individuals who participated in serology testing and the survey received a letter inquiring about their interest in participating in interviews or focus groups to do a deeper dive into their rationales for responding to the survey in the way they did. The letter included a QR code for interested participants to respond regarding their interest in participating. Individuals who expressed an interest were entered into a database. For the current study, participant responses on the ‘prayer’ mitigation activity were analyzed to identify opposing cases. Two individuals were contacted by phone and agreed to participate in virtual interviews to explore their views on the concept of prayer.

## Participant Characteristics

Ms. P is a 36-year-old Caucasian female employed at the University and Mr. M is a 43-year-old Caucasian male of government-based employment.

## Incentive

Participants received a $25.00 Visa gift card for their participation in the virtual interviews.

## Consent Process

The two individuals who participated in this study provided written consent to participate in the original study as well as any follow-up interviews related to that study. Additional verbal consent was provided by the two individuals in the current study to verify their continued willingness to participate in the research project.

## Confidentiality of the Data

This data from the original study was entered directly into a HIPAA compliant, hospital-based medical record system at UNC-Chapel Hill Medical School, known as CareLink, and the UNCP REDCap system. Recordings and transcriptions from the current study were maintained on an encrypted, password protected hard drive.

## Intervention

The current study involved virtual interviews with two individuals who exhibited opposing profiles regarding the scoring on the prayer item in the original survey. An interview schedule (See Appendix B) was developed to guide these conversations. The interviews were recorded, and the recordings were transcribed. The investigator and a faculty member evaluated the interview transcriptions using content analysis techniques to identify themes associated with the use of prayer. The research team members then met to come to a consensus regarding the themes that emerged. 100% agreement was achieved.

## Survey

Participants were given the full 15 statement vaccination survey (See Appendix C) along with a second survey on mitigation efforts (See Appendix D) developed using the model from Betsch et al. (2018). Participants were asked how effective they felt the identified actions were in the prevention of COVID-19.

# Findings

The aim of these case studies is to demonstrate a need for messaging to be driven by the population and their values. The focus is on prayer and its use in relation to the use of other preventative measures against the COVID-19 pandemic. Ms. P and Mr. M were chosen based on their scores which represented differing views. Through analysis of the transcriptions there was a 95% agreement rate achieved by evaluators.

Themes that Ms. P and Mr. M had in common were that they both prayed, they both used prayer for comfort, and they both preformed risk assessments. Ms. P stated, “I’m not extremely religious, but I am, I would say, spiritual.” For her, prayer was defined as being used in a “spiritual” manner in a way that fostered and inspired “hope” while helping her to achieve “mindfulness” in her day-to-day life, specifically in the COVID-19 pandemic. For Mr. M, prayer was defined as a “routine” religious practice in which he states that he prays “silently, to myself, in various situations and places.” Mr. M used prayer to “ask for help” and to seek “healing” in the face of illness. When using prayer for comfort, Ms. P said, “If I have a cold, I don’t pray for healing, I pray for comfort in my mind and I go take cold medicine.” While Mr. M states that through using prayer for healing, he finds comfort. Risk assessments were performed by both participants in their personal lives. Ms. P found that when she had less information about COVID-19, she was more cautious, but with more information, she has relaxed in some respects because she feels she has a good understanding of how to prevent illness based on the literature she reads. Mr. M maintains the same degree of caution throughout the pandemic in his personal life but is required to be more cautious in his work environment, he also expresses that he feels he has a good understanding of disease prevention due to the literature he reads.

Where Ms. P and Mr. M begin to differ are in their forms of prayer as discussed prior, their perceived basis for common sense, and their sources of information. Ms. P expressed that her prayer is one of spiritual background while Mr. M expressed that his prayer is religious. When it comes to common sense, Ms. P stated that “the Creator gave me common sense” while Mr. M noted that his acquired common sense is what helped him through the height of COVID-19. These two descriptors of common sense can be differentiated by external common sense and internal common sense. What Ms. P describes her common sense as is considered external and what Mr. M describes his common sense as is considered internal. The sources of information that Ms. P and Mr. M base their views from are also different. Ms. P discusses interacting with “like-minded” people in her profession and reviewing scientific literature while Mr. M notably discusses the “political realm” and “administration” as sources that stick out to him in his daily life. While neither are right or wrong sources of data, this can show that Ms. P may rely more on the Cognitive Domain while Mr. M may rely more on the Affective Domain. This may be due to environmental influences such as place of employment affecting the flow of information.

# Discussion

Through content analysis of Ms. P and Mr. M’s transcripts, it becomes evident that prayer is a broad term that cannot be broken down into simply religious and non-religious. While Ms. P scored prayer low as an effective preventative measure and Mr. M scored prayer high as an effective preventative measure, they both still utilize it in their daily lives. Prayer serves as a vessel for comfort, healing, and meditation. It remains a well-trusted practice in the face of uncertainty. These two individuals, while using prayer in diverse ways, maintain this practice throughout the pandemic because of its employment in their daily lives. For Ms. P, prayer is a reinforcing experience that provides her with a sense of mindfulness as she looks at literature regarding COVID-19. She uses prayer as a tool for comfort while believing she has been instilled with “common sense” to use the science given to her. For Mr. M, prayer is a deeply personal and grounding experience that provides him with aid and health in times of need. He seeks out materials that provide him with information within the scope of politics and news which are presented with the feelings of the audience in mind. By looking at these two similar but vastly different individuals, the need for a better understanding of the impact of prayer on all aspects of their lives emerges.

# Implications for Developing a Framework for Interventions

It is evident that by comparing these two that Ms. P, who prays non-religiously, falls into the Cognitive domain of *Bloom’s Taxonomy* while Mr. M, who prays religiously, falls into the Affective domain of *Bloom’s Taxonomy*. If the use of prayer can be applied to these domains on a mass scale, health education can be catered better to the needs of individuals. While providing materials supported by scientific evidence may work for those in the Cognitive domain like Ms. P, using faith-based interventions may work for individuals who use prayer in a religious way and fall into the Affective domain like Mr. M. Examples of these interventions can be group testimonial, pastoral leadership, church-sponsored education/events, or tailored communications (Campbell et al., 2006). Involving the church may be the most beneficial for these individuals. Another way to cater to the Affective domain could simply be brief commercial vignettes that include individuals of the same appearance, job, or culture as the populations requiring COVID-19 education the most. It is not a lack of educational resources that is affecting participation in preventative measures, but a lack of appealing educational resources.

# Study Limitations

The small sample size limits the transferability of the results. Those willing to be interviewed represented opposing cases but, because of the diversity on multiple characteristics of the participants in the parent study, may not fully represent the population of interest.

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**Appendix A**

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| **Screening:** Participants will remain in their cars; they will be screened (temperature check & COVID Signs & Symptoms Checklist). Participants with a positive screen will move through Pathway A. Participants with a negative screen will move through Pathway B. |
| **Pathway A** |  | **Pathway B** |
| **1** | (a) Remain car; Register in REDcap System; Receive PPE & Register in the REDcap System |  | **1** | (a) Park car; (b) Approach Registration Tent, (c) Receive PPE & (d) Register in the CareLink [EPIC] System |
| **2** | Provide a buccal swab test kit and instruct participant on its use. Participant will perform swab procedure while being observed by study personnel. Completed sample will be placed in a sealed bag and returned to study personnel. |  | **2** | Move to Waiting Area B; Obtain Vital Signs & Brief Health History |
| **3** | Provide patient education regarding self-care and self-quarantine activities |  | **3** | Move to Serology Station for COVID-19 Antibody Test |
| **4** | Return home with self-quarantine instructions |  | **4** | Move to Waiting Area B;* Randomly selected individuals will be asked to complete a brief survey in REDcap (during first serology testing period only)
* All individuals will be provided with education regarding self-care activities and a snack and be observed for 5-10 minutes
 |
| **5** | Be notified via a phone call by a health care practitioner associated with the study of test results & receive education on self-monitoring activities and follow-up care if needed |  | **5** | Return home |
|  |  |  | **6** | Be notified by a health care provider associated with study of test results & receive education on self-monitoring activities and follow-up care if needed |

**Appendix B**

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| **Interview Schedule** |
| **Recall** |
| Do you remember the survey? |
| Do you remember how you ranked wearing a facemask? Handwashing? Prayer? |
| **Explanation** |
| Tell me about how you scored wearing a facemask. |
| Tell me about how you scored handwashing. |
| Tell me about how you scored prayer. |
| How do you use prayer? |
| Tell me about how things have changed from the beginning of COVID-19 to now. |
| Do you know what a risk assessment is? |
| Do you find yourself making risk assessments? |
| Tell me about how you make a risk assessment. |

**Appendix C**

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| **5C scale measuring psychological antecedents of vaccination** |
| Confidence α = .85 |
| **I am completely confident that vaccines are safe.** |
| Vaccinations are effective. |
| Regarding vaccines, I am confident that public authorities decide in the best interest of the community. |
| Complacency α = .76 |
| **Vaccination is unnecessary because vaccine-preventable diseases are not common anymore.** |
| My immune system is so strong, it also protects me against diseases. |
| Vaccine-preventable diseases are not so severe that I should get vaccinated. |
| Constraints α = .85 |
| **Everyday stress prevents me from getting vaccinated.** |
| For me, it is inconvenient to receive vaccinations. |
| Visiting the doctor’s makes me feel uncomfortable, this keeps me from getting vaccinated. |
| Calculation α = .78 |
| **When I think about getting vaccinated, I weigh the benefits and risks to make the best decision possible.** |
| For each and every vaccination, I closely consider whether it is useful for me. |
| It is important for me to fully understand the topic of vaccination, before I get vaccinated. |
| Collective responsibility α = .71 |
| **When everyone is vaccinated, I don’t have to get vaccinated, too. (R)** |
| I get vaccinated because I can also protect people with a weaker immune system. |
| Vaccination is a collective action to prevent the spread of diseases |
| Instruction: “Please evaluate how much you disagree or agree with the following statements.” (1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = moderately agree, 7 = strongly agree). Scoring: mean scores of each sub-scale. Item with (R) is reverse-coded. For the short scale use bold items. |
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**Appendix D**

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| **Perceived effectiveness of mitigation efforts against the COVID-19 pandemic** |
| Wearing a face mask. |
| Praying. |
| Washing your hands with soap or using hand sanitizer frequently. |
| Seeing a health care provider if you feel sick. |
| Seeing a health care provider if you feel healthy but worry that you were exposed. |
| Avoiding public spaces, gatherings, and crowds. |
| Avoiding contact with people who could be high risk. |
| Avoiding hospitals and clinics. |
| Avoiding restaurants. |
| Avoiding public transportation. |
| Instructions: “Please evaluate how much you disagree or agree with the following statements.” (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Scoring: total all statements for final score |