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NEW PHARMACIST PRACTITIONER EXPERIENCES OF LISTENING AND RESPONDING TO PATIENT-DRIVEN MISINFORMATION

A Thesis

presented in partial fulfillment of requirements

for the degree of Master of Science

in the Department of Pharmacy Administration

The University of Mississippi

by

SAARA Z. NASRUDDIN, PHARMD

August 2023

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ABSTRACT

Background/Objectives

The infodemic, layered with partisan politics and unsubstantiated medical claims, placed pharmacists in a position to not only have to actively stay up-to-date on developing COVID-19 information but also COVID-19 misinformation. While pharmacists are taught which sources to trust for guidance on public health concerns, it is unclear how new pharmacist practitioners (NPP) were prepared and able to handle patient-driven misinformation. The primary objective of this study is to describe NPP experiences of handling COVID-19-related misinformation presented by patients.

Methods

The study included semi-structured interviews over Zoom with a sample population of St. John's University (SJU) and University of Mississippi (UM) PharmD 2020 and 2021 graduates recruited through purposive and snowball sampling until saturation was met. Participants received a $25 Amazon gift card for a 30-minute semi-structured interview. Interview questions were based on the constructs of the HURIER model and constructs of the WHO algorithm on how to respond to vocal vaccine deniers. Data was analyzed by deductive thematic content analysis with three coders and the HURIER model and the WHO algorithm were employed as a guiding framework.

Results

A total of 13 interviews were completed. Eight participants (61.5%) graduated from SJU (Queens, NY) and five (38.5%) graduated from UM (Oxford, MS). Participants worked in independent (30.8%), chain (23.0%), long-term care (15.4%), and ambulatory care/hospital pharmacies (30.8%). The types of COVID-19 misinformation NPP heard during the pandemic aligns with the techniques and topics of anti-vaccine arguments outlined by the WHO's algorithm. Evaluation skills of identifying reputable sources and information, along with interpretation of patients' language tone, and sources, were used to identify misinformation and patients' willingness to be corrected on the misinformation. All NPP responded to misinformation regardless of the technique or topic of misinformation. However, the mechanism of response may have differed depending on whether a technique of misinformation or topic of misinformation was presented.

Implications

As new recommendations around health misinformation management are being developed, this baseline knowledge of NPP misinformation management practices can 1) guide communication researchers to test the effectiveness of these mechanisms used to responding to misinformation in practice 2) help schools and colleges of pharmacy understand which areas of communication student pharmacists need further training in.

LIST OF ABBREVIATIONS

NPP – New Pharmacist Practitioners

APPE – Advanced Pharmacy Practice Experiential

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To my parents, Sheik and Zenel, thank you for your dedication to supporting my education, raising me to be "the best Saara I can be" and with the values that inspire my research. To my brother Saud, cousin Ameera and Aunty Shanie, thank you for cheering me on from 1100 miles away and for being a home I'm always eager to return to. To my grandparents, Abdul & Jamela and Mohamed & Bibi, words can't express how grateful I am for your examples of hard work, generosity and faith that inspire me every day, and for your sacrifices that led to the opportunities I'm blessed with today. Thank you.

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CHAPTER I

INTRODUCTION

Doctor of Pharmacy graduates in the years 2020 and 2021 have been placed into a unique position of completing their advanced pharmacy practice experiential rotations during a pandemic and thereafter promptly joining the workforce to assist in efforts to overcome it. Not only have these newly minted pharmacists been fighting on the frontlines as essential workers but they also have been battling an "infodemic".[1]

Misinformation & the "Infodemic"

An infodemic, defined by WHO, is the overabundance of information including false or misleading information in digital and physical environments during a disease outbreak.[2] The COVID-19-related infodemic is approximated to have started around January 10th, 2020, when most of the world news covered the new and contagious SARS-Cov-2 strain.[3] On February 15th, 2020, the World Health Organization general director commented "We´re not just fighting and epidemic; we're fighting an infodemic."[3] While the globe has overcome pandemics in the past, the context of a pandemic occurring within the digital age made the COVID-19 pandemic not just about advancing science to defeat a virus but also about convincing others to trust the science. The science of infodemiology, which developed in 2009, is study of how and what information on electronic platforms are distributed with the purpose of informing public health and policy.[4] It suggests that changes in internet and electronic communication and information can be a sign of changes in population health. In the context of the COVID-19 pandemic, a technology driven society in which most people have immediate access to scientific information

as it is being developed, knowledge is not only rapidly evolving but it is also reported from and interpreted by numerous sources.[1] Information and discussion online significantly contributes to false interpretations and noncompliance of public health guidance.[5] Unintentionally, social media has provided a platform to spread misinformation and foster distrust of mainstream sources of information such as state agencies, the Food & Drug Administration, and the Centers for Disease Control.[6,7] For these reasons healthcare professionals and public health officials alike have been battling an "infodemic" alongside the coronavirus.

Misinformation has been defined as the spreading of false information unintentionally compared to disinformation which is intentional.[8] However, within the literature the term "misinformation" has also been used in reference to the active spread of false information.[9] Therefore, throughout the following manuscript, misinformation will be used in the context of active spread of false or misleading information whether intentional or not.[10]

The accessible nature of pharmacists puts them in a unique position to counteract misinformation. Typically, anyone can ask a pharmacist health-related questions without having to make an appointment or pay for their services. Because pharmacists are accessible and seen up to ten times more frequently by their patients compared to primary care physicians,[22] they are exposed to medical misinformation by patients regularly.[1]

CHAPTER II

LITERATURE REVIEW

Types of misinformation

There are five types and misinformation: satire, misleading content, imposter content, manipulated content, fabricated content (Table 1).[11,12] A sample of 225 pieces of misinformation between January to March 2020 of the COVID-19-related infodemic was collected by First Draft, a nonpartisan organization that aims to protect communities from misinformation, through the Poytner's International Fact-Checking Network (IFCN) and Google's Fact Check Explorer.[13] An analysis by researchers from the University of Oxford's Reuters Institute for the Study of Journalism found that 59% of misinformation was manipulated content and 38% of misinformation was completely fabricated content.[13]

Table 1. Types of Misinformation[11,12]

Misinformation Type	Definition
Fabricated content	Completely false content
Manipulated content	Distortion of genuine information or imagery, for example a headline that is made more sensationalist, often popularized by 'clickbait'
Imposter content	Impersonation of genuine sources, for example by using the branding of an established news agency
Misleading content	Misleading use of information, for example by presenting a comment as a fact
Satire and parody	Presenting humorous but false stories as if they are true. Although not usually categorized as fake news, this may unintentionally fool readers

Healthcare Professionals as Trusted Sources for Information

While the media is a source of health information, public trust in both reputable and disreputable media has declined.[14] People trust scientists, particularly medical scientists, over institutions for scientific information.[14] Compared to other outlets, people trust health care professionals the most for COVID-19 health information.[15] Health care professionals (HCP) are reported to be more reliable than social media.[15] Therefore it is important for healthcare professionals to be involved in communicating the efficacy of vaccines and public health preventative behaviors.

The National Institutes of Health Community Engagement Alliance (NIH CEAL) recommends health professionals address misinformation by acknowledging and empathizing

with patient concerns, and debunking and explaining the misinformation in plain language.[16] The U.S Surgeon General's Advisory on Building a Healthy Information Environment released a guidebook on *Confronting Health Misinformation* and advised health professionals to "proactively engage with patients and the public on health misinformation."[17] They advise to understand patients' perspective, knowledge and beliefs and correct misinformation in personalized ways.[17] The World Health Organization also has additional guidance for health professionals to combat misinformation on social media that can be applied to in-person interactions as well (Table 2).[18] It is often said that the practice of medicine is an art and a science,[19] and this is especially true when it comes to addressing health misinformation. Both aspects of customizable unique approaches and scientific facts are needed.

Table 2. Recommendations for HCP to Combat Misinformation[16–18]

Source	Recommendations
National Institutes of Health Community Engagement Alliance (NIH CEAL): Addressing COVID19 Misinformation[16]	1. Identify Key Misinformation In Your Community 2. Choose which misinformation to address 3. Acknowledge and Empathize [Concerns] 4. Debunk and Explain
U.S Surgeon General's Advisory on Building a Healthy Information Environment: Confronting Health Misinformation[17]	1. Proactively engage with patients and the public on health misinformation 2. Use technology and media platforms to share accurate health information 3. Partner with community groups and other local organization to prevent and address health misinformation
World Health Organization: Tackling COVID19 Misinformation- A Social Media Toolkit for Healthcare Practitioners[18]	Do's for engaging with vaccine hesitant • Be empathetic and listen. In most cases, people sharing misinformation think they are helping and will have genuine questions or concerns • Keep your key messages simple, emphasizing high safety instead of low risk as well as the social benefits of vaccines. Repeat these messages often; do not use scientific jargon or acronyms if you can avoid them • Repeat your key messages as often as possible so your audience will be more likely to remember them • Use inclusive terms to underline a shared identity with the audience e.g. 'we as parents', or 'as members of a community' • Underline scientific consensus with regard to vaccine safety and efficacy Don't for engaging with vaccine hesitant • Don't repeat any anti-vaccine arguments or unauthorized sources - stick to your facts • Don't repeat myths which are sent to you

	• Avoid a sense of 'guilt tripping' people to get the vaccine • Avoid raising questions about the personal motivation of vocal vaccine deniers - save such discussions for private personal interactions

Pharmacists' Expanding Roles in The Pandemic

Pharmacy practice and the role of pharmacists has evolved significantly during this pandemic. Pharmacies became testing sites and pharmacists have been on the frontlines to neutralize the pandemic by vaccine distribution and administration.[20,21] Newly graduated pharmacists have had to adapt significantly to these changing roles and responsibilities. The infodemic, layered with partisan politics and unsubstantiated medical claims, has put pharmacists in a position to not only have to actively stay up to date on developing COVID-19 information but also to communicate these findings in patient-friendly language that counteracts misinformation.[1] While communication is already emphasized in accreditation standards for pharmacy schools as the Pharmacists' Patient Care Process (PPCP), new pharmacist practitioners (NPP) do not the have years of experience communicating with patients as their more experienced pharmacist colleagues do. NPP have had to further develop these skills during a time when misinformation was volatile and divisive.

Due to pharmacists' role as immunizers, their need to dispel medical misinformation is not exclusive to the COVID-19 pandemic. Vaccinations and immunizations continue to be a much-contested topic. Those with misinformed beliefs about vaccines spread their opinions and create vaccine hesitancy leading to lower vaccination rates, further disease spread, and the

resurgence of previously eradicated diseases.[24–28] With this role of pharmacist immunizer comes the role of 'misinformation dispeller.'

Study Rationale

Dispelling misinformation is nuanced as misinformation stems from various sources ranging from mistrust of government to social media to political online conspiracy theories.[9,10,29–31] While pharmacists are taught which sources to trust for guidance on public health concerns, it is unclear what processes NPP use to communicate and dispel patient-driven misinformation. Studying NPP provides insight on the communication skills developed from pharmacy training experiences rather than communication skills developed from years of experience as a practicing pharmacist. The objectives of this study are to (1) describe NPP experiences of handling COVID-19-related misinformation presented by patients; (2) identify the types of COVID-19-related misinformation NPP typically encounter; (3) identify motivations of NPP to handle COVID-19-related misinformation, and (4) identify facilitators and barriers for NPP to handle COVID-19-related misinformation.

CHAPTER III

FRAMEWORK

The HURIER model of listening instruction (Figure 1), a WHO recommended model for best practice guidance on how to respond to vocal vaccine deniers in public, and the WHO algorithm of how to respond to vocal vaccine deniers (Figure 2) was used to guide the development of the interview questions and data analysis of this study.[32] While there are many communication frameworks, they generally describe the iterative process of communication between both parties and require evaluating communication from the perspective of both participants.[33] For example, in the Osgood-Schramm model of communication, both parties relay (encode), receive (decode) and interpret messages and communication is circular.[34] This interactive communication model does not fit this study's objectives as it requires also evaluating the patients' process of encoding, decoding and interpreting. This study focuses on the NPP perspective of their experiences and processes of addressing COVID-19 misinformation; therefore, these traditional communication frameworks are not applicable. While it may have been possible to describe the iterative process of communication through NPP recall of patient misinformation encounters, it would have severely lacked key information of the patients' perspective of the encounter.

HURIER stands for hearing, understanding, interpreting, evaluating, remembering, and responding.[32] The model was first developed by Judi Brownell to understand the perspective of the individual listener during the listening process, which is viewed as a system of the six inter-

related constructs making up its name.[35] This process is affected by subconstructs of individual listening filters such as organizational role, values, attitudes, previous experiences and bias.[36]

The HURIER model was used in previous research to identify differences between nursing managers' self-perception of their listening skills as compared to their direct reports' perceptions of the nursing managers' listening skills.[37] Both nursing managers and direct reports were given the HURIER listening questionnaire adapted from Brownell.[37] Overall, direct reports rated their managers as having better listening skills than the nursing manager self-reports.[37]

The WHO algorithm on how to respond to vocal vaccine deniers was originally developed as a guide for scientists to combat "anti-vaccine" advocates in public debate settings. The key components of the WHO algorithm (Figure 2), are identifying the technique and topic of the anti-vaccine argument and then choosing a response based on those factors. The techniques used to validate and justify misinformation are conspiracies, fake experts, selectivity (picking select information without the full context), impossible expectations [of science/healthcare/vaccines], and misrepresentation & false logic. The topics of misinformation are threat of disease, alternatives, effectiveness, trust, and safety.

According to the WHO's Best practice guidance: How to respond to vocal vaccine deniers in public, an example of how to respond to someone using the technique of "conspiracies" (i.e. person says "the government is systematically hiding the real data") to further exemplify and attack the main topic of "trust" of vaccines (i.e. person says "the government received kick-backs from the pharmaceutical industry") is to uncover the conspiracy and highlight credibility of health authorities (i.e. responding with "The conspiratorial notion of

this statement completely ignores the mass of scientific evidence produced by independent scientists all over the world and the benefits of vaccination in protecting entire populations from life-threatening diseases").[32] Although this communication tactic was intended for public debate settings and not healthcare provider-patient interactions, the potential overlaps in topics and techniques of misinformation were anticipated to help explain the COVID-19 misinformation that NPP heard and potentially how it was addressed.

In this study the HURIER model and WHO algorithm were used to capture the self-perception and process of NPP hearing misinformation, including the types of misinformation heard (topics and techniques of misinformation), their characteristics and factors that influenced their response (Listening Filters: Previous Experiences, Bias, Values, Attitudes, Organizational Role), their cognitive processes of determining whether to respond and how to respond (Interpreting, Understanding, Evaluating), and how they responded (Responding to Topic, Responding to Technique). The HURIER construct of "Remembering", which involves remembering the information heard, was not included due to concerns over feasibility of evaluating and applicability to describing the NPP experience of responding to misinformation.

To our knowledge, previous literature has not provided a precedent of how to apply HURIER or the WHO algorithm in either provider-patient listening and communication pathways nor misinformation listening and communication pathways. While neither model was designed to capture experiences of provider-patient listening and communication pathways, they provide utility and insight into the experiences of NPP in combatting COVID-19 misinformation for two reasons. First, the HURIER model provides specificity to the internal cognitive processes

and reasoning as well as external factors that affect NPP response to misinformation. These internal thought-processes and external factors have the potential to influence whether NPP respond to misinformation (i.e. whether they are personally motivated to handle misinformation or if their environment allows for time to address it) and how they respond (i.e. how they interpret the misinformation and evaluate the appropriate resources and communication tactics to mitigate misinformation). Second, the WHO algorithm explains the specific types of anti-vaccine arguments and that responses are based on the technique and topic of the argument used. Due to the volatility of COVID-19 misinformation, these techniques and topics from the WHO algorithm may describe the specific types of misinformation NPP heard and their process to addressing it.

Figure 1. HURIER model of listening instruction (provided by WHO)[32]

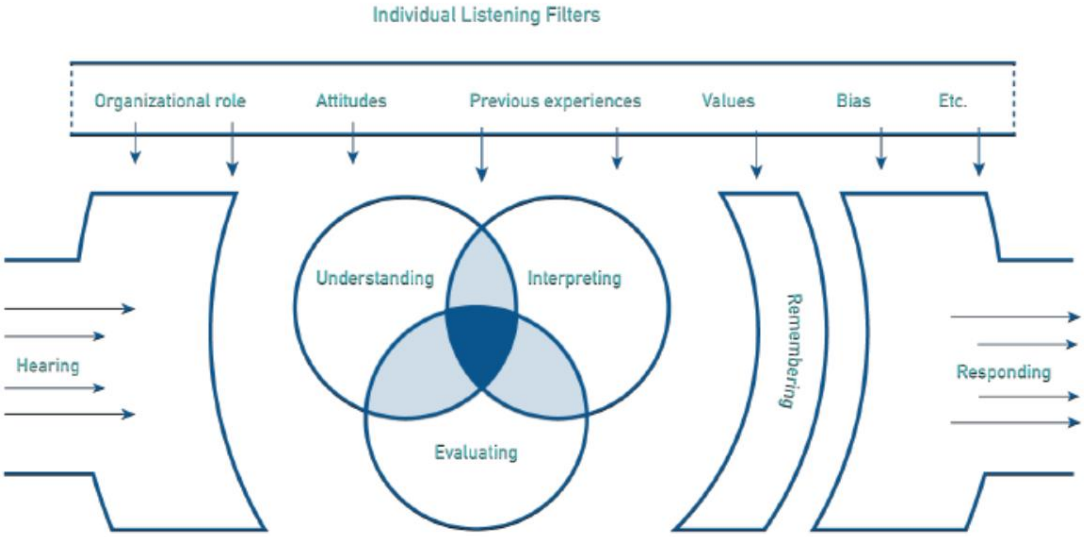


Figure 2. WHO Algorithm of How to Respond to Vocal Vaccine Deniers[32]

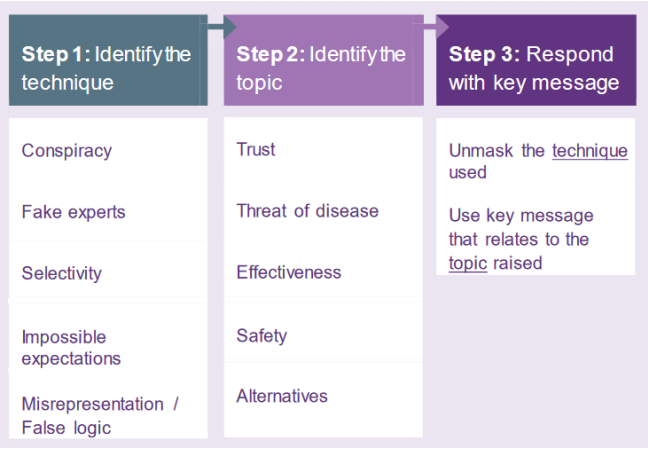
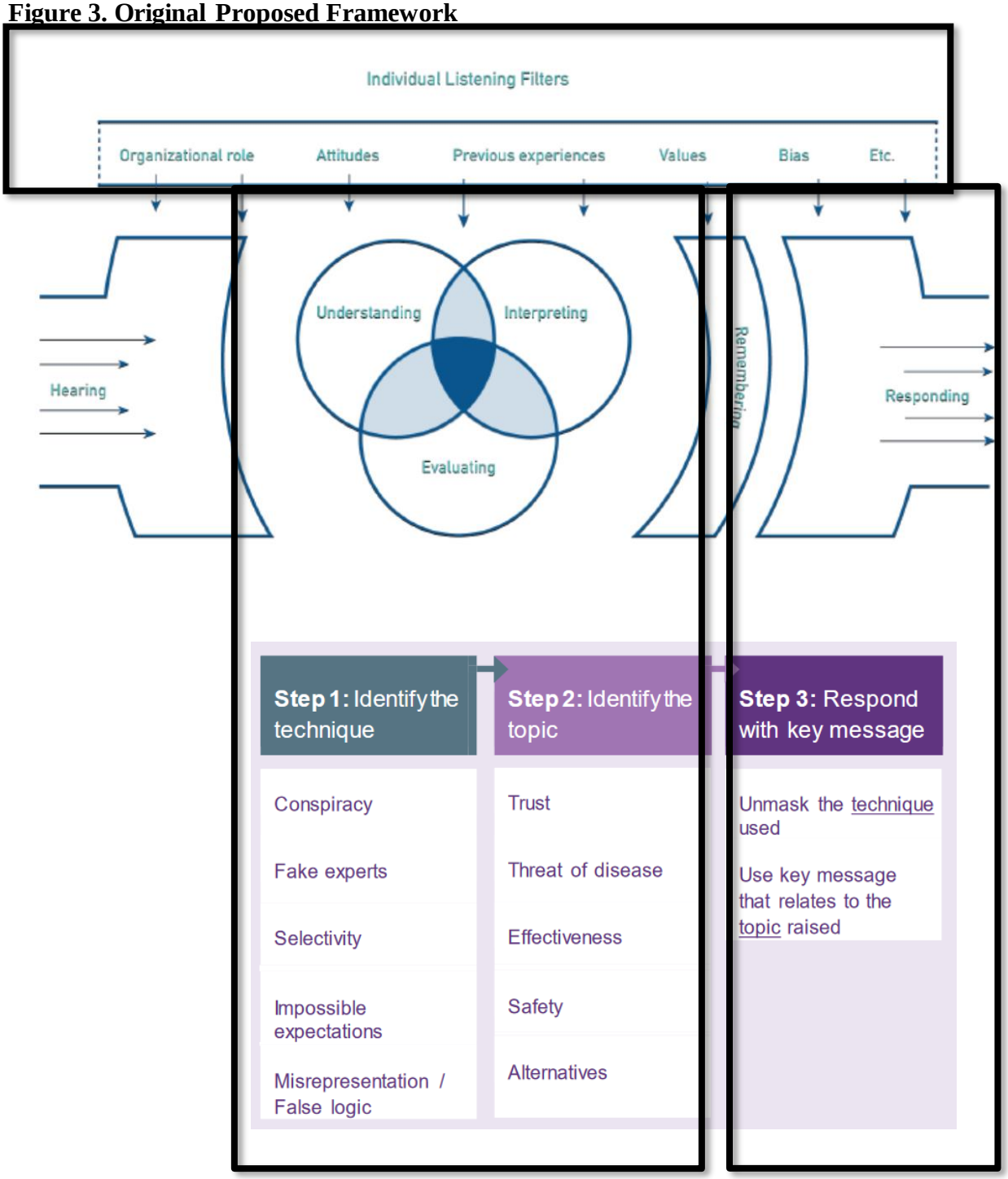


Figure 3. Original Proposed Framework



CHAPTER IV

METHODS

Design

This study performed semi-structured interviews that took place virtually over Zoom. Participants were encouraged to have their cameras on to help establish rapport and build connection with the interviewer but personal preferences of cameras off were respected.

Sample Population/Recruitment Strategy

The sample population were Doctorates of Pharmacy who graduated in 2020 and 2021, were currently employed as licensed pharmacists in jobs that require patient interaction on a daily or weekly basis including but not limited to community pharmacists, ambulatory care pharmacists, medication therapy management call center pharmacists, and mail order pharmacists. Recruiting NPP from diverse settings contributed to developing breadth of data.

This study employed both purposive and snowball sampling strategies by contacting practicing pharmacists who graduated in 2020 and 2021 through established connections at the University of Mississippi School of Pharmacy and the St. John's University College of Pharmacy and Health Sciences networks and asking for referrals for additional pharmacist participants upon completion of each scheduled interview. Interviews were scheduled via Calendly and participants were sent an email with a Qualtrics link to the informed consent form along with a screening questionnaire, found in Appendix A and B, to determine eligibility. Participants also received an interview reminder email with the informed consent form along with terminology that would be used in their interview (Appendix F). These strategies were employed to broaden

the sample as much as possible. Recruitment took place until saturation was met. Participants were reimbursed $25 each for the 30-minute interview.

Data Collection

The interview guide uses constructs of the proposed framework (Appendix C and Appendix D) and were pilot tested with student pharmacists who work as pharmacy technicians/interns to ensure the questions are appropriate in the context of this study. The semi-structured interviews were conducted over Zoom, digitally recorded securely by the investigator, and transcribed using Trint software. A total of 13 interviews were conducted from mid-July to mid-September 2022.

Interview Guide

The interview script and questions, found in Appendix C, were designed based on constructs of the HURIER model and the WHO algorithm of responding to vocal vaccine deniers, as shown in Appendix D. Of the questions asked, some captured single constructs while others captured multiple constructs. Participants were first thanked for their participation and verbally asked permission to record the interview. Then the interviewer shared screen and reviewed definitions of terms relevant to the interview questions (Appendix F).

The interviewer then began asking questions to gain familiarity with the interviewee and by inquiring about their practice setting and patient population, how they perceived the COVID-19 pandemic impacted their experiences starting out as a new pharmacist, and how the changing guidance surrounding COVID-19 affected their pharmacy practice. These questions aimed to

capture constructs related to bias, organizational role and attitudes towards addressing COVID-19 misinformation, respectively.

Subsequently, participants were asked questions related to misinformation specifically: whether they believed it was the pharmacists' role to handle misinformation and if they categorized their patients who presented COVID-19 misinformation as being vaccine hesitant, resistant or rejectors and their reasoning. These questions related to constructs of organizational role, and bias/understanding/interpreting/evaluating respectively.

Participants were then asked a series of questions on what were the topics of misinformation they commonly heard from their patients (Hearing), how they knew these topics were misinformation (Understanding/Interpreting), what were the sources of misinformation that patients gave (Hearing/Evaluating), the background information they utilized to check the validity of the misinformation (Evaluating), and how they would typically respond to patients presenting misinformation (Responding).

Next participants were asked to recall a specific instance in which a patient presented misinformation to them (Hearing), whether they responded (Responding) and if yes, how did they respond (Responding) and what information from pharmacy school helped them in this situation (Previous Experiences). Then participants were asked to reflect on what were the patients' underlying reasons to justify their belief in the misinformation (Understanding/Interpreting/Evaluating/Bias) and whether their underlying reasoning for believing the misinformation affected their response (Bias).

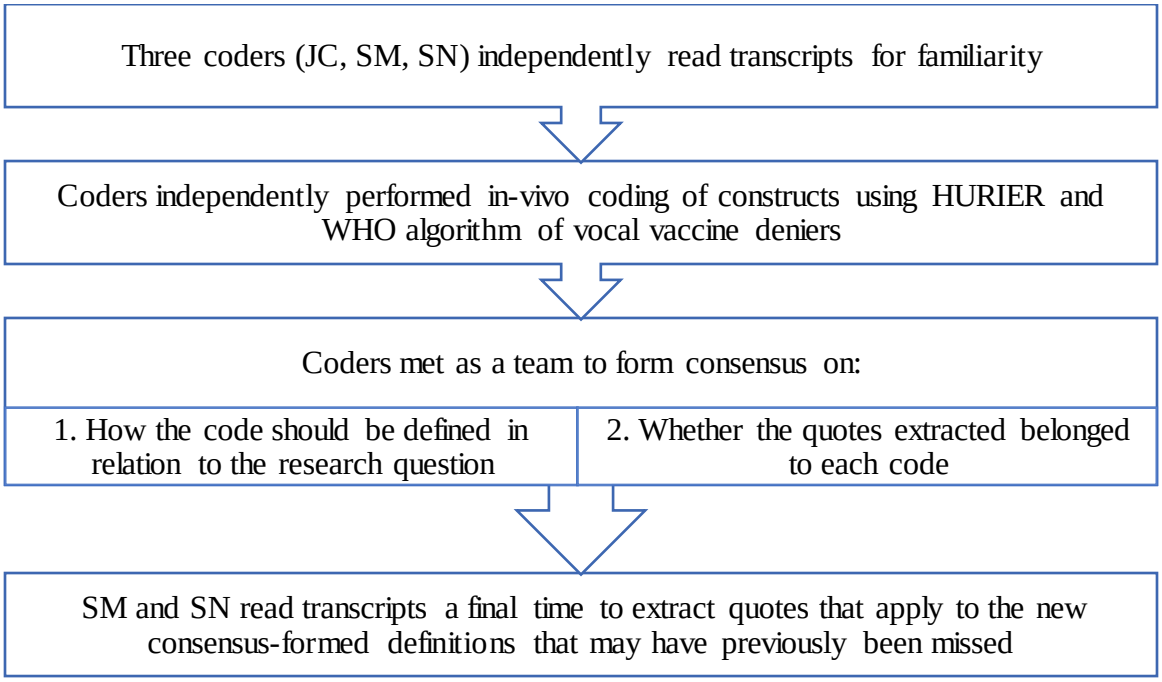
The following questions moved away from the specific example and asked participants generally whether the specific nature or content of misinformation affects their response (Responding/Bias) and the factors they consider when deciding to engage in misinformation (Organizational Role/Evaluating).

Lastly, participants were asked if and how their pharmacy curriculum and APPE rotations prepared them to address misinformation (Previous Experiences), if there are additional information or resources that would be helpful to them in their current role or as a student pharmacist, and whether they had any additional information they would like to share that wasn't covered in the interview.

Data Analysis

Data were analyzed by thematic content analysis to identify patterns and develop themes as to what are pharmacists' experiences of handling COVID-19 related misinformation. The thematic analysis process involved a deductive coding approach.[38] Three coders (JC, SM, SN) were employed to achieve consensus, reduce bias, and improve credibility of findings. A summary of the analysis process is shown in Figure 4.

Figure 4. Data Analysis Procedure



The first step the team took in the coding process was independently reading the transcripts to gain familiarity with the interviews. Subsequently, each coder re-read the transcripts and performed in-vivo coding of participants' key phrases deductively using constructs from the HURIER model and WHO algorithm. These constructs codes included: organizational role, attitudes, previous experiences, values, bias, understanding, interpreting, evaluating, topic (threat of disease, alternatives, effectiveness, trust, safety), technique (conspiracy, fake experts, impossible expectations, misrepresentation and false logic, selectivity), responding to topic, responding to technique. The in-vivo coding process involved each coder

extracting quotes into an excel document based on how they understood the code definition in relation to the research question.

Because neither the HURIER model nor the WHO algorithm was specifically designed for COVID-19 misinformation and the listening filters of the HURIER model (organizational role, attitudes, previous experiences, values, bias) were not defined by the original author, the three coders met regularly to 1) come to consensus on how the code should be defined in relation to the research question and 2) read through each quote pulled for every code and discuss whether they believed the quote belonged to the code. In the process of reaching consensus on the codes' definition, the team adapted or created definitions for each code that aligned with established definitions and were relevant to study objectives (Table 3).

Within this step of code adaptation, SN read the provided definition of the code, if there was one available, out loud then asked the other coders to provide their understanding of the code and the rationale behind it. Then the group would discuss the similarities and differences in how each coder conceptualized the code. Consensus on the codes' definition would typically occur at this stage. If the code did not have a provided definition, the group would research traditionally understood definitions of the code and then discuss and come to consensus on how to appropriately define the code in context of the research question.[39–42]

For example, when the team met to come to consensus on the code "organizational role", SN first asked JC and SM to share how they defined organizational role in context of the research question when extracting quotes. Both shared they defined this code as "work responsibilities; values related to work responsibilities and roles pharmacists play to address

misinformation". SN agreed with their definition and added "responsibility of addressing COVID-19 misinformation and vaccine misinformation". However, the three coders agreed that these definitions had overlap and similarity with "values" and "attitudes", which they had not came to consensus on yet. The coders researched definitions of organizational role, values and attitudes and discussed how they applied to the context of describing NPP experiences of handling COVID-19 misinformation. Upon researching "organizational role" as a team,[39] it was clear that the context of the environment and how it played a facilitator or barrier in addressing COVID-19 misinformation was inherent to the definition. Additionally, because of what we knew of the fast-changing nature of COVID-19 and the roles of pharmacists,[1] this was included in the final definition (Table 3). When researching "values" and "attitudes", the distinction between the personal set of principles, associated with the former, and the way one actually feels, associated with the latter, became apparent.[40] This aided in shaping the definition of values being defined as one's personal principles as a pharmacist in addressing misinformation and attitudes being defined as one's personal feelings in addressing misinformation (Table 3). Code definition and adaptation was an iterative and collaborative process.

Once there was consensus on the codes' definition, the team read through all the quotes that were previously extracted to determine if the quote still aligned with the code or not. In a measure to ensure coders objectively stated their opinion on whether a quote should be retained or removed, SN organized the excel document into separate tables before team meetings so that coders were randomly assigned as coder A, coder B and coder C and the table had their respective quotes for each code. By maintaining anonymity of which quotes were pulled by

whom, the three coders were able to objectively evaluate the quote without any one coder being put in a defensive position of feeling pressured to alter their choice to adhere to the group. SN read each quote out loud, and SM and JC would first provide their opinions and reasoning on whether the quote belonged to the code; subsequently, SN would provide her opinion and reasoning. Once all or 2/3 of the coders agreed on retaining or removing a quote, with no one coder being adamantly opposed to the decision, consensus was achieved.

Lastly, after concluding the entire process for each code, SN and SM read through the transcripts one more time and extracted any quotes that apply to the consensus-formed definitions of the deductive codes that may have previously been missed. Similarly, all or 2/3 of the coders agreed one each quote, with no one coder being adamantly opposed to the decision, to reach consensus.

Table 3. Updated Framework and Definitions

	Original Definition	Updated Definition
Hearing	Concentrating on and attending to the message	Content of misinformation heard, including but not limited to the topics and techniques of misinformation heard
Threat of Disease (topic of misinformation)	Disease is not a threat any more	Disease (COVID-19) is non-threatening/nothing to worry about
Alternatives (topic of misinformation)	There are alternatives to vaccinations (i.e. homeopathy, natural immunity)	There are alternatives to COVID-19 vaccines/public health measures, natural remedies
Effectiveness (topic of misinformation)	Vaccines are ineffective	Questioning whether the vaccine/public health measures are effective at preventing COVID-19 (i.e. does it actually work)
Trust (topic of misinformation)	Not trusting institutions/gov agencies/manufacturers promoting vaccines	Statement eluding to government or other health institution withholding information or should not be trusted
Safety (topic of misinformation)	Questioning safety of vaccine	Questioning safety of COVID-19 vaccine/public health measures (i.e. side effects)
Conspiracies (technique of misinformation)	Arguing that scientific consensus is the result of a complex and secretive conspiracy.	Explanation of a scheme by the government or other health institution [43]
Fake Experts (technique of misinformation)	Using fake experts as authorities combined with denigration of established experts.	Using fake experts including people, media, or internet as authorities combined with denigration of established experts.

Selectivity	Referring to isolated papers that challenge scientific consensus.	N/A
Impossible Expectations (technique of misinformation)	Expecting 100% certain results or health treatments with no possible side-effects.	Expecting 100% certain results or health treatments with no possible side- effects; expecting something that the vaccine couldn't deliver/beyond the efficacy of vaccine
Misrepresentation & False Logic (technique of misinformation)	Jumping to conclusions, using false analogies etc.	Jumping to conclusions, using false analogies; sources/theories that are exaggerated; false logic about the vaccine
Understanding	Comprehending the literal meaning of the message	Comprehending the literal meaning of the misinformation
Interpreting	Sensitivity to nonverbal and contextual aspects of the message	Takes into account the communication context, speaker's perspective, sensitive to nonverbal and contextual aspects surrounding the message
Evaluating	Logical assessment of the value of the message	Logical assessment of the value of message. after hearing misinformation (I.e. the background information/resources/logical thought process)
Responding	Selecting an appropriate response to what is heard	Overall approach to responding to misinformation
Responding to topic	N/A	How pharmacists respond to the main issue (the "what") of misinformation (i.e. threat of disease, alternatives, effectiveness, trust, safety)
Responding to technique	N/A	How pharmacists respond to the reasoning people use to believe the misinformation (i.e. conspiracies,

		fake experts, impossible expectations, misrepresentation & false logic)
Values	N/A	One's own set of principles and beliefs in the role of a pharmacist in addressing misinformation[40]
Attitudes	N/A	Personal feelings about addressing misinformation based on realities of being a pharmacist[40]
Previous Experiences	N/A	Any previous learning experiences in pharmacy practice (education, rotation, lab, work) that influence process of address misinformation[42]
Organizational Role	N/A	Change in roles due to COVID; facilitators and barriers of work environment to addressing misinformation[39]
Bias	N/A	Unfavorable opinions about people from different backgrounds and characteristics, including but not limited to race, education, economic status, and vaccine hesitancy status[41]

CHAPTER V

RESULTS

Demographics

A total of 13 interviews were completed. Eight participants (61.5%) graduated from St. John's University College of Pharmacy and Health Sciences (Queens, NY) and five (38.5%) graduated from University of Mississippi College of Pharmacy (Oxford, MS). Participants worked in independent (30.8%), chain (23.0%), long-term care (15.4%), and ambulatory care/hospital pharmacies (30.8%).

Table 4. Demographic Characteristics of Interviewed Participants (N=13)

	%	N
School/College of Pharmacy		
St. John's University (Queens, NY)	61.5%	8
University of Mississippi (Oxford, MS)	38.5%	5
Pharmacy Practice Setting		
Independent Community	30.8%	4
Chain Community	23.0%	3
Long Term Care	15.4%	2
Ambulatory Care/Hospital	30.8%	4

In the following sections, the experiences of new pharmacists handling COVID-19-related misinformation are explained through the deductive codes from the HURIER model and

the WHO algorithm for combatting vocal vaccine deniers. In total ten (10) themes and eleven (11) subthemes were found. All themes and subthemes were found except for "Understanding" and "Selectivity." To begin answering the primary objective of this study, the characteristics of the new pharmacists and their environments (values, attitude, previous experiences, bias, and organizational role) will be discussed. Then an explanation of how NPP interpreted and evaluated of patient driven misinformation will be outlined. Lastly NPP's responses to the misinformation including how they responded to the technique and topic of misinformation will be discussed.

Table 5. Techniques and Topics of Misinformation NPP Heard

	Definition	Participant Quote
Techniques of Misinformation		
Conspiracies	Explanation of a scheme by the government or other health institution	*"For COVID vaccines? I would say 'the government is tracking us' literally. As much as it's you know, you wouldn't expect it, a vast majority of patients believe that there's a microchip in it and they are being monitored for every single task they do. "- Participant 1*
Fake Experts	Using fake experts including people, media, or internet as authorities combined with denigration of established experts.	*"I have heard Facebook and other social media outlets: Twitter, Instagram, TikTok. There's a lot of conspiracy theories out there. And then also like it's word of mouth. I feel like people hear misinformation from their friends or family and they trust these people. So they accept it as truth…." -Participant 13*

Impossible Expectations	Expecting 100% certain results or health treatments with no possible side-effects; expecting something that the vaccine couldn't deliver/beyond the efficacy of vaccine	*"So people think that the vaccine is there to cure the virus, but they don't understand that it just decreases the side effects or the complications of the virus." - Participant 3*
Misrepresentation & False Logic	Jumping to conclusions, using false analogies; sources/theories that are exaggerated; false logic about the vaccine	*"I think it was said as a joke. But in relation to the vaccine, you had a bunch of people saying, oh, well, it's going to change your DNA." – Participant 4*
Topics of Misinformation		
Threat of Disease	Disease (COVID-19) is non-threatening/nothing to worry about	*"I think you still have people all the time they're like… it's just a cold and people aren't dying from it. And even if you did get it, you're going to recover from it no problem."- Participant 4*
Alternatives	There are alternatives to COVID-19 vaccines/public health measures, natural remedies	*"a lot of people were like "oh, I can take hydroxychloroquine then that will help me from getting COVID" or "I can take azithromycin or Z-Pak."- Participant 1*
Effectiveness	Questioning whether the vaccine/public health measures are effective at preventing COVID-19 (i.e. does it actually work)	*"And then when they know people that get it [COVID-19], they're like, that's when they become more hesitant and resistant to it [COVID-19 vaccine] because they're like, Oh, well, they got it [COVID-19 vaccine] and they still got COVID. So why should we get like a booster? why to get the vaccine to begin with?"- Participant 9*
Safety	Questioning safety of COVID-19 vaccine/public	*"Like, you know, there was like a time when people were saying, oh,*

	health measures (i.e. side effects)	*it causes infertility, it causes blood clots, it causes, you know…rashes and things like that."- Participant 5*
Trust	Statement eluding to government or other health institution withholding information or should not be trusted	*"The government [is] putting chips inside [you] once you agree to the vaccine and… like the government's having this…power and they want to control citizens."- Participant 2*

Characteristics of NPP: Values, Attitudes, Bias, Previous Experiences, Organizational Role

Values & Attitudes

All participants held values that addressing misinformation was one of the responsibilities of a pharmacist, as Participant 11 described: *"I think it is pharmacists' responsibility to the best of their knowledge and to the best of their extent to fix misinformation. Because if we start at the smaller scale, we can really have a huge impact."* Participants also expressed a disposition of personally wanting to address any misinformation from their patients as Participant 10 explains,

> *"the pharmacy that I'm in is very like central in the community. So it's a very trusted location. So that even puts more of a responsibility on me to be an asset to this community … I would always do my best with every single patient to just at least do my part and at least do my best to just stop this misinformation and do my part in controlling the pandemic as much as I can."*

However, even while NPP attitudes towards handling patient-driven COVID-19 misinformation were positive, a few also noted there is a boundary to how much they can do, as described by Participant 12, *"I can't control the Internet. And I can't control what other people say to them…*

So I do my best to make sure that whatever I tell to my patients and when they're asking me questions, that I give them accurate information."

Bias

While NPP overall expressed values and attitudes of wanting to address misinformation, participants' biases, centering on viewing patients as unwilling to change, may hinder their engagement with the patient. As Participant 5 explained, *"But in general, what I've seen is that anyone who… [has] a certain belief of not getting vaccines because of their religion, they're not going to change their mind. No matter how much information they hear bad or good, they won't change their mind."*

Organizational Role

Work environment served as another barrier to handling misinformation. Increased workload brought on by the COVID-19 pandemic impacted the length of discussion participants were able to have with their patients as described by Participant 7:

> *"I was at CVS and it was very overwhelming when the vaccine first came out. So, we were doing like a vaccine every 5 minutes on top of the regular workflow. So, at that point, like if a patient came up to me like trying to have like a 20, 30 minute conversation about either the vaccine or any information that they had or their concerns, I would address it, but it would be very brief, like, here's the resources you could use. Here's the information. And I couldn't really like fully address it…"*

Social distancing also reduced the length of interactions and relationships participants were able to have with their patients. Participant 3 explains:

> *"So before the COVID-19 pandemic, as an intern, I feel that I had a closer bond to my patients...Now, the patients are more cautious. Some of them do take more distance between you [in] the counseling. You find that there's still like a little gap between each other. I see that people just want to finish counseling quickly. They don't want to spend too much time with you, I guess, because the fear of catching COVID-19 or some virus."*

Previous Experiences

Across graduates of both schools/colleges of pharmacy, participants had mixed responses on whether their training in pharmacy school helped to prepare them to handle misinformation. Participant 3 said:

> *"I would say certain rotations depending on the preceptor, they kind of trained you to speak up and have a plan when a doctor spoke to a patient, [for] how [you] approach them in a confident way. The labs help you prepare how to find reliable information and sources…And that kind of helped us build our confidence when we're speaking at a young age in this profession."*

Some participants also said their pharmacy training did not prepare them to handle misinformation. Participant 5 said, *"So I wouldn't say that there was a lot of training in terms of*

misinformation and then in terms of how to respond to misinformation. So that's something that you pick up while you're working in the setting."

Cognitive Processing of Misinformation: Interpretation & Evaluation

Interpreting

All participants used contextual cues such as patients' language, tone, and sources cited to understand the severity of patients' beliefs in misinformation. Techniques of misinformation (Table 4), such as fake experts and conspiracy gave participants context clues into assessing patients' willingness to hear accurate information as explained by Participant 8:

> *"Well, I guess part of it is if they use more severe words, about like how dangerous it is, typically that's a tip off and also wherever they are getting their information from. If they trust like the CDC and FDA typically those people tend to be more hesitant or resistant just because they're using an evidence-based source, but they're still really nervous about it. If they start quoting things like vaccinefreedom.org or like, you know, any like prominent politician that was very anti about it, those people typically all tended to be vaccine rejectors and were staunchly against it..."*

Evaluating

In addition to accounting for communication context through interpretation, all participants made logical assessments of the misinformation they heard. Staying up-to-date on COVID-19-related information and becoming familiar with the data and facts about the COVID-19 vaccine, which

participants reported learning from previous experiences in APPE rotations and specific pharmacy courses, helped them to evaluate misinformation as Participant 7 explained:

> *"Honestly, it's like putting together the information that we have. So, like when we got the information on the vaccine, we obviously looked at the ingredients, possible side effects, that are actually part of the study. So, we kind of take that information and with our prior knowledge. We kind of can put together the pieces if this information isn't valid or, you know, here's the information to back that up to kind of prove that like all this information is correct."*

Responding to COVID-19 misinformation

Responding to technique

Participants responded to the technique of misinformation by providing recommendations of good sources, withholding judgments, and guiding patients through a logical thought process. In response to the prompt of, "what if a patient told you there was a microchip in the vaccine?", Participant 8 said:

> *"I would not say, well, you're wrong ... because that's like the worst thing to say to someone to get them to understand that they're wrong ... I would try to explain, you know, well. Here is what you know the CDC and FDA say. Here is just like our package insert on it ... I would explain like the fact that it's a ten-dose vial ... we draw these out of multi-dose vials, so ... how would you be sure that every vaccine got a microchip? Just explaining things like that to make them kind of think through it."*

For conspiratorial types of misinformation, it was found that participants were less inclined to go into depth with their response and ultimately reminded the patient of their autonomy in decision making. Participant 5 explained, *"So I usually would just say there's no evidence for us to see any microchips … And I would just leave it at that, because a lot of the time I don't want to entertain that crazy theory because it's so out of our practice realm that nothing I can give them will be an answer to satisfy them".*

Responding to topic

In responding to the topic of misinformation, participants addressed patients' concerns about trust, effectiveness, and safety by explaining facts in layman's terms with specificity of the process. Related to trust and effectiveness Participant 12 described:

> *"What I try to tell people is that just because the vaccine was made quickly does not mean that it's not effective. The technology behind it was not made quickly. It's been in process for decades...So I tried to give them the logic behind it … And that seems to help most people understand that, oh, this isn't a new technology, it's just a new virus that we're fighting."*

In addition to explaining specificity of the COVID-19 vaccine process, participants also explained the purpose of vaccination and warned about potential consequences of inaction to vaccinate to address patient's view of COVID-19 being non-threatening (threat of disease). Participant 3 shared, *"When there's cases where the patients say, "I'm worried, I don't want to take the booster", I explained to them … from the beginning … this vaccine was made to*

decrease your illness, not to treat it … And then you could bring up scenarios, how you could have not taken it and you could have been hospitalized or, God forbid, had huge complications."

CHAPTER V

DISCUSSION

This study describes NPP experiences handling COVID-19 misinformation through examining the types of misinformation they heard, the intrinsic and extrinsic characteristics that may affect their cognitive processes of interpreting and evaluating misinformation, and their responses to misinformation. The types of COVID-19 misinformation NPP heard during the pandemic aligns with the techniques and topics of anti-vaccine arguments outlined by the WHO's Best Practice: How to Respond to Vocal Vaccine Deniers.[32] The listening filters from the WHO's Best Practice guidelines of values & attitudes and previous experiences facilitate NPP in addressing misinformation while bias and organizational role were perceived barriers by NPP in addressing misinformation. Evaluation skills of identifying reputable sources and information, along with interpretation of patients' language tone, and sources, were vital to identifying misinformation and patients' willingness to engage in discussion about the misinformation.

All NPP reported that they responded to misinformation regardless of the technique or topic of misinformation. However, the response may have differed depending on whether a technique of misinformation or topic of misinformation was presented. Techniques of

misinformation participants recalled responding were “fake experts” and “conspiracies” and required reinforcing reputable sources, guiding patients through a logical thought process, and withholding judgements. Topics of misinformation participants recalled responding to were “trust”, “safety”, and “effectiveness” which involved a more direct approach of providing information to patients about the process of vaccination manufacturing process in layman’s terms, the purposes of vaccination, and consequences of not vaccinating.

Through both their professional values and personal attitudes, NPP demonstrate a responsibility and willingness to address misinformation. Participants expressed that addressing misinformation is part of a pharmacists’ responsibility and that they personally are driven to dispel misinformation. This personal motivation and attitude toward dispelling misinformation appears to be connected to how NPP understand their professional role as pharmacists. These findings align with the call to action for pharmacists to recognize combatting misinformation as a professional responsibility.[1]

While NPP are motivated to address misinformation, issues related to bias and organizational role serve as barriers. Bias towards patients in assessing their willingness to change or hear new information, may have prevented NPP from initiating engaging conversations. Some NPP seemed to view older age, having a strong cultural/religious/community upbringing, presenting conspiratorial beliefs, and being argumentative as being associated with an unwillingness to change from their beliefs. Although these did not prevent pharmacists from attempting to address misinformation, the depth and content of the discussion may have been reduced.

Related to organizational role, high workloads also prevent NPP from having the engaging, detailed and personalized discussions that are needed to address health misinformation.[17] Additionally, the need for social distancing created literal distance between NPP and their patients as the patients themselves didn't want to have extended time in the pharmacy. While some of these organizational roles are COVID-19 pandemic specific, the problem of high workloads and staffing shortages in pharmacies persists with pharmacist shortages forcing pharmacies like CVS and Walgreens to reduce store hours.[44]

NPP had mixed responses on whether their previous experiences in pharmacy school and APPE rotations prepared them to address misinformation. The most useful classes, labs, and APPE rotations were those that encouraged and taught them to research and critically evaluate literature, find reputable data sources, and practice communication skills. While the Accreditation Council for Pharmacy Education (ACPE) does not contain specific language addressing misinformation, that established systems within schools and colleges of pharmacy provides student pharmacists with both didactic and practice-based learning skills that help NPP in practice. These established systems could also be expanded with the intention to reflect the realities of patient interactions in pharmacy practice. These realities involve addressing the different topics and techniques of misinformation which include but are not limited to patients' trust of non-reputable sources (fake experts) and mistrust of government and health institutions (conspiracies/trust).

The types of COVID-19 misinformation heard by NPP were found to align with those outlined by the WHO's algorithm of responding to vocal vaccine deniers. Traditionally

misinformation is viewed as falling into one of the five types: fabricated content, manipulated content, imposter content, misleading content, or satire and parody.[11,12] The results of this study show that for health-related misinformation, and specifically vaccine-related misinformation that healthcare professionals experience in practice can also be understood as a topic or technique of misinformation. However, the theme of "selectivity", a technique of misinformation, did not appear. In this research, conspiracies and trust were highly related to each other. Conspiracies were distinguished by whether a scheme or plan by the government or health institution was mentioned.[43] Previous research has shown that conspiratorial mindsets are predictors of reduced trust in scientific and medical institutions.[45,46]

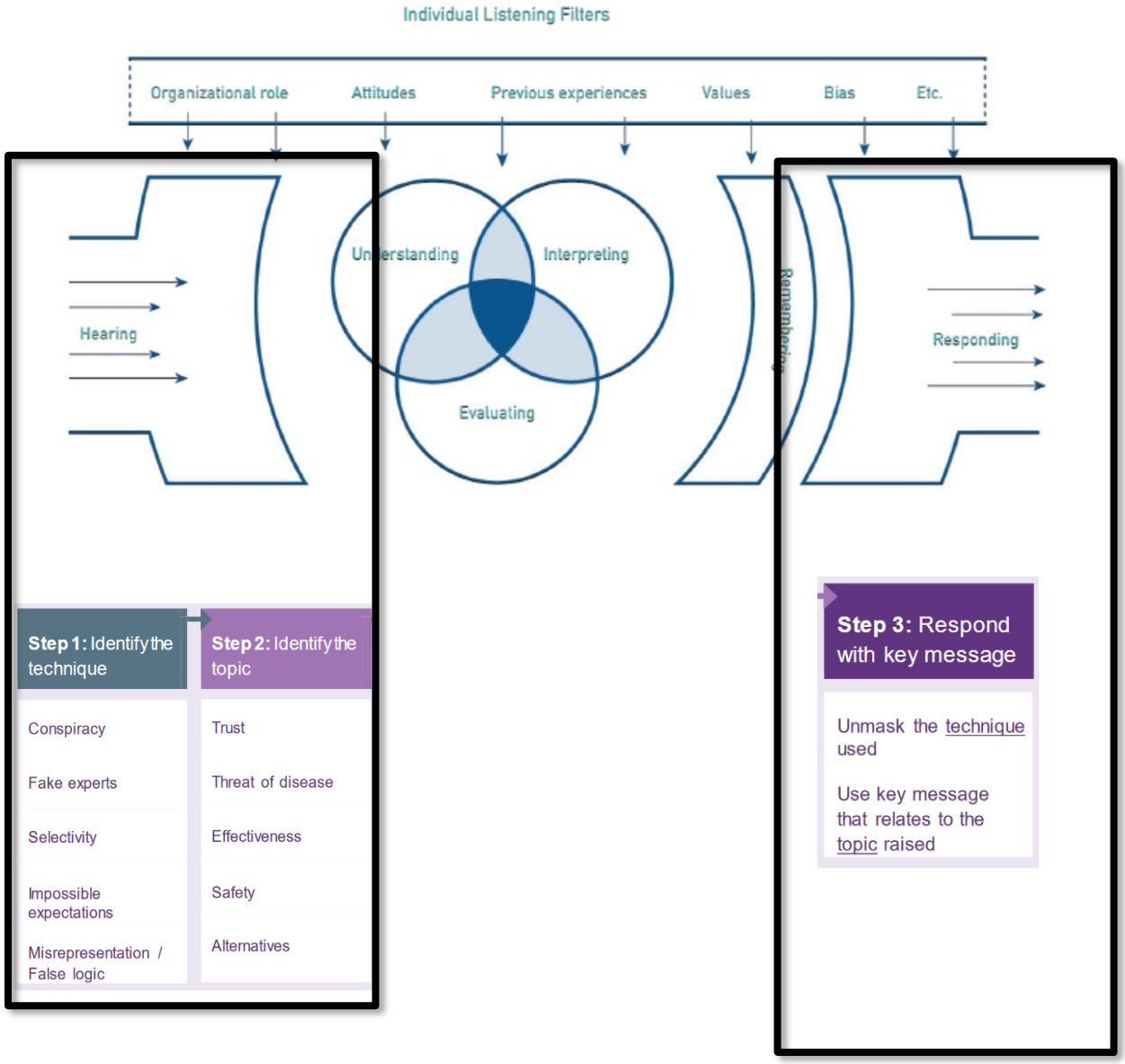
The components of the WHO algorithm of how to respond to vocal vaccine deniers, identifying the technique and topic of misinformation and choosing a response based in the technique and topic, were originally proposed to serve as subconstructs for the understanding, interpreting, and evaluating constructs of the HURIER model (Figure 3). However, upon further examination of data from the interview questions the coders observed that the information collected were the arguments/rationale participants heard from patients, not necessarily how the participants understood, interpreted, or evaluated the misinformation. Therefore, an update to the framework is proposed so that technique and topics of misinformation become subconstructs of the construct hearing (See Figure 4).

This study also found that the cognitive processes of the communication receiver involved once the misinformation is heard aligns with some constructs of Judi Brownell's HURIER model.[32,35] Interpretation, defined as considering contextual and nonverbal cues, was

an important cognitive process all NPP in this study went through to know that they were being presented with misinformation. The techniques of misinformation such as conspiracies and fake experts and the argumentative language, provided some context for NPP to know what they are hearing was misinformation. These contextual factors were also found in bias. NPP's interpretation of their patient's characteristics can lead to a systematic categorization of patients which is bias. For example, patient's tone (i.e. aggressive tone) was a context cue that NPP used to interpret misinformation and it was also a characteristic that NPP held bias toward (the patient is not willing to engage in discussion on misinformation). While Brownell had previously mentioned that bias and evaluation were potentially linked, this study suggests that interpretation and bias seem to inform one another.[35]

Additional components of the cognitive process outlined in the proposed framework were evaluation and understanding. Because NPP reported that they stayed-up-to date on COVID-19 information, the evaluation of whether information presented by patients was misinformation seemed intuitive to NPP. Knowing reputable sources and how to critically examine information, learned through classes and APPE rotations taught NPP evaluation skills. However, understanding, comprehending the literal meaning of the message, was not found in the data because the message in this study was false information. NPP were able to identify with why a patient might believe in misinformation or how extreme the misinformation is through context cues and logical assessments, interpretation, and evaluation, not from understanding the literal meaning of the message.

Figure 5. Updated Proposed Framework



Limitations

There are several limitations to this study. One of them is recall bias. Participants were asked to recall misinformation they heard from patients and interactions handling misinformation. Interviews with New York and Mississippi participants took place from July to September 2022 and COVID-19 cases peaked in January 2022 in for these states.[47,48] It is very possible that participants incorrectly recalled the reality of the interactions. Additionally, social desirability bias may be present in this study. It is possible that participants gave responses to appease or meet desirable expectations of what they thought the researcher wanted to hear, especially in terms of values and attitudes related to addressing misinformation. Due to the study population being new practitioners, it is especially possible that social desirability bias may have been present.

Implications

This study provides a baseline understanding of mechanisms and cognitive processes NPP, and potentially how new health care professionals in general, respond to misinformation based on topic and technique of misinformation and their motivations and barriers to addressing misinformation based on their didactic training. In this study, NPP showed high levels of

motivation to address misinformation, utilization of skills and resources from pharmacy training to evaluate misinformation, and identification of context cues and content of misinformation to formulate responses to misinformation. Schools and colleges of pharmacy should consider incorporating practice labs of handling misinformation into the curriculum and continue to reinforce communication strategies.

Additionally, this study shows that while NPP did not have prior knowledge of the terminology behind the different topics and techniques of misinformation, NPP knew to adapt their communication based on the content and context of the misinformation. The baseline understanding of how NPP typically respond to misinformation in practice and the mechanisms that influence their responses that are provided in this study can help guide communication researchers to test the effectiveness of these responses and mechanisms.

While this study described NPP characteristics, cognitive processes, and mechanisms used to address misinformation in practice, efforts are already being made to provide guidance to healthcare professionals on effective mechanisms to handle misinformation from patients. One of the efforts being made in this area is MisinfoRx: A Toolkit for Healthcare Providers.[49] This toolkit outlines three guiding principles for healthcare providers: 1) compassionate understanding, 2) connection, 3) collaboration. Within compassionate understanding, providers are encouraged to 1) start a bi-directional conversation, 2) allow patient self-expression, 3) identify what matters to the patient. After compassionate understanding providers should then focus on connection through 1) meeting patients with compassion by affirming patients' efforts, goals and values, and 2) confirm what [the patient told you] is true and false and explain why.

Lastly, it is recommended to collaborate with the patient by 1) building on common ground, 2) offer recommendation, allow input, 3) wrap up, follow up and readdress with the "teach back" method.

While MisinfoRx provides instruction for healthcare professionals, this study provides the perspective of healthcare professionals in addressing misinformation. The perspective of healthcare professionals can guide the uptake of changes in how misinformation is handled. For instance, the findings of this study demonstrate that when NPP deemed it appropriate and safe to engage in discussion with patients (i.e. by utilizing interpretation skills of context cues), NPP initiated the bidirectional conversation and allow for patient self-expression. Otherwise, NPP responded through a unidirectional flow of information by informing patients of correct and factual information, not necessarily encouraging a conversation. Additionally, the principles outlined by MisinfoRx require time and potentially a private environment. Because the toolkit is designed for healthcare providers whose interactions with patients most often take place in private settings, pharmacists practice environments vary and are often in a public space. This study describes the organizational role of NPP which include heavy workloads with short staffing and physical distancing from patients, and these factors may impede the uptake of the MisinfoRx principles. These perspectives on actual practice environments can help social behavioral researchers design additional interventions to facilitate the uptake of health misinformation management guidance and testing effective implementation strategies. This perspective can also help schools and colleges of pharmacy prepare student pharmacists with resiliency and tools to handle misinformation.

Conclusion

This research aimed to describe the experiences of NPP in handling patient driven COVID-19 misinformation. Based on a qualitative deductive thematic content analysis utilizing the WHO's algorithm of how to respond to vocal vaccine deniers and the HURIER model as frameworks, NPP's process of addressing misinformation involved interpreting and evaluating the misinformation based on content, context cues, using reputable sources, and tailoring responses based on the technique or topic of misinformation presented. Characteristics about NPP that facilitate dispelling misinformation are strong values and attitudes towards addressing misinformation and previous experiences of communication and identifying reputable sources in pharmacy training. Characteristics that create barriers to addressing misinformation are increased workloads, physical distance from patients, and bias on the willingness of patients to be corrected on information. Overall, these findings suggest there are 1) a need to further investigate the best communication tactics to mitigate the different types of misinformation and 2) an opportunity to further train pharmacists and pharmacy students on how to dispel misinformation.

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APPENDIX

APPENDIX A. Qualtrics Consent Form

Study Title: New Pharmacist Practitioner Experiences of Listening and Responding to Patient-Driven Misinformation

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Key Information for You to Consider
• **Voluntary Consent**. You are being asked to volunteer for a research study. It is up to you whether you choose to participate or not. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate or discontinue participation. • **Purpose**. The purpose of this research is to understand new pharmacist practitioner experiences with handling COVID19-related patient-driven misinformation. Ultimately, we anticipate the findings from this research will inform the misinformation landscape and identify strategies, facilitators, and barriers of listening and responding to misinformation. Please download and read the linked document with standardized definitions of terms that will be used in the interview.** • **Duration.** It is expected that your participation will last 30 minutes. • **Procedures and Activities.** You will be asked to participate in an interview over Zoom. We encourage you to have your video camera on but you may also choose to join the Zoom meeting with audio only. You will be asked permission to record the interview for the purpose of generating an audio transcript. Your video, audio and name will be kept confidential. • **Risks.** There are no anticipated risks to you from participating in the study. • **Benefits**. Some of the benefits that may be expected include a $25 Amazon gift card after interview completion you might experience satisfaction from

contributing to scientific knowledge and having your voice and experiences represented in scientific literature.

- **Alternatives.** Participation is voluntary and the only alternative is to not participate.

What you will do for this study

- We ask you to participate in a 30-minute interview and answer questions on your pharmacy practice experiences of listening and responding to COVID-19 related misinformation from patients.
- Please download and read the linked document with standardized definitions of terms that will be used in the interview.
- We encourage you to have your video camera on but you may also choose to join the participate with audio only.
- You will be asked permission to record the interview for the purpose of generating an audio transcript. Your video and/or audio recording and name will be kept confidential.

Videotaping / Audiotaping
You will be asked permission to record the interview for the purpose of generating an audio transcript.

Time required for this study
This study will take about 30 minutes.

Possible risks from your participation
There are no anticipated risks to you from participating in the study.

Benefits from your participation
You should not expect benefits from participating in this study. However, you might experience satisfaction from contributing to scientific knowledge and having your voice and experiences heard and represented in scientific literature.

Incentives
You will receive a $25 Amazon gift card after interview completion.

Confidentiality

1. Recordings will be generated for the purpose of producing a transcript which the investigator will use to compare the responses of all participants for the purpose of

identifying recurring themes and ideas. The audio and video itself will not be used for any purpose beyond the creation of the transcript. Your name and other identifying information will be protected. Research team members will have access to your records. Recordings and identifying information will be stored on a secure password protected file. Audio and visual recordings of your interview will be deleted after the transcripts are generated and upon conclusion of the project. We will protect confidentiality by coding and then physically separating information that identifies you from your responses.

2. Members of the Institutional Review Board (IRB) – the committee responsible for reviewing the ethics of, approving, and monitoring all research with humans – have authority to access all records. However, the IRB will request identifiers only when necessary. We will not release identifiable results of the study to anyone else without your written consent unless required by law.

Confidentiality and Use of Video/Audio Tapes

1. Only the research team will have access to the recordings
2. Recordings will be kept until transcripts are generated and checked for errors
3. File names for the recordings will be coded to protect confidentiality and recordings will be stored in a secure file
4. Direct quotes will be taken from the transcript of the interview in the research investigator's thesis manuscript, publications and/or presentations

Right to Withdraw

You do not have to volunteer for this study, and there is no penalty if you refuse. If you start the study and decide that you do not want to finish, just tell the interviewer. Whether or not you participate or withdraw will not affect your current or future relationship with the investigator, Department of Pharmacy Administration, or with the University, and it will not cause you to lose any benefits to which you are entitled.

IRB Approval

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. If you have any questions or concerns regarding your rights as a research participant, please contact the IRB at (662) 915-7482 or irb@olemiss.edu.

Please ask the researcher if there is anything that is not clear or if you need more information. When all your questions have been answered, then decide if you want to be in the study or not.

Statement of Consent

I have read the above information. I have been given an unsigned copy of this form. I have had an opportunity to ask questions, and I have received answers. I consent to participate in the study.

(Participant chooses either of the following):

- **Yes, I consent to participate and verify I am at least 18 years of age (You will be led to the eligibility questionnaire and then scheduling)**
- **No, I do not consent to participate *(skip logic is used and participant is thanked and exited out of the survey)***

APPENDIX B. Qualtrics Screening Questionnaire

1. Are you a practicing pharmacist? (Y/N)
2. Did you graduate pharmacy school in the years 2020 or 2021? (Y/N)
3. Do you interact with patients (phone or in-person) on a daily or weekly basis? (Y/N)
4. Have you ever heard misinformation from patients? *Misinformation refers to the intentional or unintentional belief in false or misleading information* (Y/N)
5. What field in pharmacy do you work in? (Open textbox)

APPENDIX C. Interview Questions

I would like to thank you for participating in this interview on New Pharmacist Practitioner Experiences of Listening and Responding to Patient-Driven Misinformation. You have a right to stop this interview at any time or refuse to answer any questions you're not comfortable with. Before we begin, I would like to verbally ask for your permission to record this interview. The recording will only be used to generate a transcript from the audio. The video and audio from this interview will be kept confidential.

**Share screen and show definition of misinformation, copy and paste definition and leave in the chat

1. First I want to ask you some questions about your practice setting: In your current practice setting what does your patient demographics/patient population look like?
2. How has the pandemic impacted your experiences starting out as a newly practicing pharmacist in comparison to your pre-pandemic experiences in pharmacy training (e.g. rotations as a pharmacy student or working as a pharmacy technician/intern)?
3. How has the effect of uncertainty and constantly evolving changes surrounding COVID-19 related guidance affected your pharmacy practice?
4. Now I would like to ask you some questions on misinformation specifically: Do you believe addressing misinformation is one of the roles and responsibilities of pharmacists? Why or why not?*
5. Of your patients who presented COVID-19 related misinformation would you characterize them as being vaccine hesitant, vaccine resistant, or a vaccine rejector? (Share screen of definitions and read the definitions aloud)
    a. What factors helped you to understand which group the patient belongs to?
6. What common topics of misinformation do you hear from your patients about COVID-19 or COVID-19 vaccinations? *
    a. How do you know these topics are misinformation?
    b. Do they mention the sources that led them to the misinformation? (What were the sources?)
    c. What resources or background information do you use when checking the validity of the patient's misinformation?
    d. Can you walk me through how you would typically respond to misinformation presented by patients? For instance, if a patient said they didn't want to get vaccinated because they believed there were microchips in the vaccine, how would you respond?*

7. Of the topics you just mentioned (list the topics they said), what is one specific instance or encounter with your patients that you can recall? Please provide as much detail as possible *
    a. Did you respond? *
        i. If no, what barriers prevented you from addressing the misinformation?
        ii. If yes, how did you respond?
            1. What information did you need to recall from pharmacy school in order to address the misinformation?**
8. Using the same example you just provided, from your understanding, what was the underlying reasoning they used to justify their belief in the misinformation?*
9. Using the same example you just provided, did their underlying reason for believing the misinformation affect whether you chose to respond?
10. Generally speaking (moving away from the example), does the specific nature or content of COVID-19 related misinformation affect whether you chose to respond? If so, how? (For example, if a patient questioned how serious COVID-19 was versus if they questioned vaccine safety versus if they said the government is using the vaccines to microchip us) *
11. What factors (whether it be your physical environment, characteristics about the patient or your own mental, emotional state) do you consider when deciding whether to engage with a patient who is expressing COVID-19 related misinformation? *
12. Did your pharmacy school curriculum prepare you to address misinformation? If so, how?**
13. Did your APPE rotations prepare you to address misinformation? If so, how?
14. Having gone through this experience in your practice, what additional information or training either when you were a student pharmacist or now in your professional role would be helpful to you? *
15. Is there anything else you would like to share?
16. Do you know any colleagues who are PharmD 2020 and/or 2021 graduates who would be interested in participating in this interview? Do you have their email addresses/contact information? They will not be required to participate in the interview but we would just like to reach out to them and ask if they are interested.

APPENDIX D. Relation of Interview Questions to HURIER Constructs and Subconstructs

Construct/Subconstruct	Interview Question
Hearing	6. What common topics of misinformation do you hear from your patients about COVID-19 or COVID-19 vaccinations?
	7. Of the topics you just mentioned (list the topics they said), what is one specific instance or encounter with your patients that you can recall? Please provide as much detail as possible
Understanding (subconstruct: Identifying topic)	6. What common topics of misinformation do you hear from your patients about COVID-19 or COVID-19 vaccinations?
	6a.. How do you know these topics are misinformation?
	5. Of your patients who presented misinformation would you characterize them as being vaccine hesitant, vaccine resistant, or a vaccine rejector?
	5a. How did these groups differ?
	8. Using the same example you just provided, from your understanding, what was the underlying reasoning they used to justify their belief in the misinformation?
Interpreting (subconstruct: Identifying technique)	6a.. How do you know these topics are misinformation?
	5a. What factors helped you to understand which group the patient belongs to?
	8. Using the same example you just provided, from your understanding, what was the underlying reasoning they used to justify their belief in the misinformation?
Evaluating	6b. Do they mention the sources that led them to the misinformation? (What were the sources?)
	6c. What resources or background information do you use when checking the validity of the patient's misinformation?

	5. Of your patients who presented misinformation would you characterize them as being vaccine hesitant, vaccine resistant, or a vaccine rejector? (Share screen of definitions and read the definitions aloud)
	5a. How did you decide which group the patient belongs to?
	8. Using the same example you just provided, from your understanding, what was the underlying reasoning they used to justify their belief in the misinformation?
	11. What factors (whether it be your physical environment, characteristics about the patient or your own mental, emotional state) do you consider when deciding whether to engage with a patient who is expressing COVID-19 related misinformation?
Responding (subconstructs: Choosing to respond to topic/Choosing to respond to technique)	6d. Can you walk me through how you would typically respond to misinformation presented by patients? For instance, if a patient said they didn't want to get vaccinated because they believed there were microchips in the vaccine, how would you respond?
	7a. Did you respond (to the misinformation)?
	7ai. If no, what barriers prevented you from addressing misinformation?
	7aii. If yes, how did you respond?
	7aii1. What information did you need to recall from pharmacy school in order to address the misinformation?
	9. Using the same example you just provided, did their underlying reason for believing the misinformation affect whether you chose to respond?
	10. Generally speaking (moving away from the example), does the specific nature or content of COVID-19 related misinformation affect whether you chose to respond? If so, how? (For example, if a patient questioned how serious COVID-19 was versus if they questioned vaccine safety versus if they said the government is using the vaccines to microchip us)
Listening Filter: Organizational Role	2. How has the pandemic impacted your experiences starting out as a newly practicing pharmacist in comparison to your pre-pandemic experiences in pharmacy training (e.g. rotations as a pharmacy student or working as a pharmacy technician/intern)?

	7ai. If no, what barriers prevented you from addressing misinformation?
	4. Now I would like to ask you some questions on misinformation specifically: Do you believe addressing misinformation is one of the roles and responsibilities of pharmacists? Why or why not?
	11. What factors (whether it be your physical environment, characteristics about the patient or your own mental, emotional state) do you consider when deciding whether to engage with a patient who is expressing COVID-19 related misinformation?
Listening Filter: Attitudes	3. How has the effect of uncertainty and constantly evolving changes surrounding COVID-19 related guidance affected your pharmacy practice?
	9. Using the same example you just provided, did their underlying reason for believing the misinformation affect whether you chose to respond?
	4. Now I would like to ask you some questions on misinformation specifically: Do you believe addressing misinformation is one of the roles and responsibilities of pharmacists? Why or why not?
Listening Filter: Previous Experiences	7aii1. What information did you need to recall from pharmacy school in order to address the misinformation?
	12. Did your pharmacy school curriculum prepare you to handle misinformation? If so, how?
	13. Did your APPE rotations prepare you to address misinformation? If so, how?
	14. Having gone through this experience in your practice, what additional information or training either when you were a student pharmacist or now in your professional role would be helpful to you?
Listening Filter: Values	4. Now I would like to ask you some questions on misinformation specifically: Do you believe addressing misinformation is one of the roles and responsibilities of pharmacists? Why or why not?
Listening Filter: Bias	1. First I want to ask you some questions about your practice setting: In your current practice setting what does your patient demographics/patient population look like?
	5a. What factors helped you to understand which group the patient belongs to?
	8. Using the same example you just provided, from your understanding, what was the underlying reasoning they used to justify their belief in the misinformation?

	9. Using the same example you just provided, did their underlying reason for believing the misinformation affect whether you chose to respond?
	10. Generally speaking (moving away from the example), does the specific nature or content of COVID-19 related misinformation affect whether you chose to respond? If so, how? (For example, if a patient questioned how serious COVID-19 was versus if they questioned vaccine safety versus if they said the government is using the vaccines to microchip us)
	10. Generally speaking (moving away from the example), does the specific nature or content of COVID-19 related misinformation affect whether you chose to respond? If so, how? (For example, if a patient questioned how serious COVID-19 was versus if they questioned vaccine safety versus if they said the government is using the vaccines to microchip us)

APPENDIX E. Recruitment Email

Dear xxx,

I am Dr. Saara Nasruddin, a current PhD student in the University of Mississippi Department of Pharmacy Administration and a St. John's University PharmD alumni class of 2020.

I am conducting research to understand the experiences of new pharmacist practitioners (graduated in years 2020 or 2021) in handling misinformation presented by patients. Misinformation is defined in this context as both the intentional or unintentional belief in false or misleading information. I hope you are willing to participate in an interview as your experience as a new pharmacist is valuable.

Participants will receive a $25 Amazon gift card after completion of the 30-minute interview. The interviews will be completed over Zoom. You can click the link below to schedule an interview at your convenience. Thank you!

APPENDIX F. Standardized Definitions Provided to Participants

Misinformation: false or misleading information that is actively spread whether intentional or not

Infodemic: the overabundance of information including false or misleading information in digital and physical environments during a disease outbreak[1]

Vaccine Hesitant: those who are not committed to misinformation about vaccinations but have generalized anxiety and specific concerns about vaccination[2]

Vaccine Resistant: those who are currently rejecting vaccination due to beliefs BUT are willing to consider information regarding safety and efficacy of vaccines[2]

Vaccine Rejectors: those who are adamant in refusal to consider vaccination information due to strongly held beliefs[2]

1. Infodemic. Accessed March 7, 2021. https://www.who.int/westernpacific/health-topics/infodemic
2. Hagood, E. A., & Herlihy, S. M. (2013). Addressing heterogeneous parental concerns about vaccination with a multiple-source model. Human Vaccines & Immunotherapeutics, 9(8), 1790–1794. https://doi.org/10.4161/hv.24888

VITA

Saara Z. Nasruddin graduated from St. John's University in 2020 with a Doctor in Pharmacy before enrolling in graduate school at the University of Mississippi. She was recognized as the P1 Teaching Assistant of the Year in 2020 by the UM School of Pharmacy, a University of Mississippi Medical Center Graduate Training and Education Center Robert Smith, MD, Graduate Scholar in 2021 and a Rho Chi Society member and secretary in 2022.