EXAMINING PROVIDER DECISION-MAKING FOR DIAGNOSING AND TREATING MEDICALLY UNEXPLAINED SYMPTOMS IN THE CONTEXT OF PATIENT GENDER AND MENTAL HEALTH HISTORY

by

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ABSTRACT

LESLIE ANN SNAPPER. Examining Provider Decision-Making for Diagnosing and Treating Medically Unexplained Symptoms in the Context of Patient Gender and Mental Health History. (Under the direction of DRS. AMY PETERMAN and VICTORIA SCOTT)

Medically unexplained symptoms (MUS), defined as symptoms lacking objective test findings or known biological causes, are highly prevalent and pose significant challenges for healthcare providers. Often associated with complex biopsychosocial origins, MUS can lead to diagnostic uncertainty. Consequently, providers may rely on patient characteristics, such as gender and mental health history, when making a diagnosis or determining appropriate treatments, which may introduce bias into their decision-making. This study investigated how these factors influence provider decision-making in diagnosing and treating MUS, focusing on two key research questions: (1) How does knowledge of a patient's gender and mental health history affect diagnostic assessment? And (2) How does it impact treatment likelihood?

Through an online survey, 152 primary care providers participated in the study, which implemented a 2x2 factorial between-subjects design. Participants were randomized into one of four conditions and reviewed clinical case vignettes, responding to questions regarding diagnostic and treatment considerations. The findings revealed a significant effect of patient gender and mental health history on treatment decisions. Providers were less likely to recommend medical follow-up for female patients with a history of depression and anxiety compared to male patients without a history of mental health concerns. For symptoms specifically involving generalized pain and fatigue, providers were more likely to attribute them to behavioral health factors than medical causes in female patients with histories of depression and anxiety compared to other groups. Conversely, for patients without a mental health history, providers favored medical follow-up over behavioral health interventions, regardless of patient gender. No significant differences emerged for diagnostic assessment or behavioral health treatment recommendations across groups.

These results suggest that patient gender and mental health history influence provider decision-making regarding the management of MUS, highlighting the need for strategies to reduce bias and improve equity in clinical decision-making. Additional research is warranted to explore these relationships further and better understand how various factors impact the assessment and treatment of ambiguous symptoms.

Keywords: Medically Unexplained Symptoms (MUS), Persistent Physical Symptoms (PPS), Provider Decision-Making, Gender Bias, Mental Health History, Primary Care, Diagnosis and Treatment, Health Disparities, Biopsychosocial Model, Clinical Bias, Patient Characteristics

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DEDICATION

I want to dedicate this dissertation to all the patients who
have shared their experiences with me and entrusted me with their care.
Their stories helped inspire this work.

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LIST OF ABBREVIATIONS

MUS	Medically Unexplained Symptoms
PPS	Persistent Physical Symptoms
FSS	Functional Somatic Symptoms
NFS	Nonspecific, Functional, and Somatoform
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
WHO	World Health Organization
PCP	Primary Care Provider
CHD	Coronary Heart Disease
OTC	Over the Counter (medication)
ADL	Activities of Daily Living
ANOVA	Analysis of Variance
MD	Doctor of Medicine
DO	Doctor of Osteopathy
IBS	Irritable Bowel Syndrome
CFS	Chronic Fatigue Syndrome
MS	Multiple Sclerosis
DSM-5-TR	DSM-5 Text Revision
ED	Emergency Department

CHAPTER 1: INTRODUCTION

1.1 Medically Unexplained Symptoms Terminology and Classification

There is a widespread phenomenon in the medical field that describes the experience of patients suffering from persistent somatic symptoms, or physical symptoms in the body, with unknown causes. The most common terminology used to describe this phenomenon is “medically unexplained symptoms” (MUS) (Olde Hartman et al., 2017). However, the terminology, conceptualization, and management of these symptoms or syndromes are often inconsistent, creating problems for both research and clinical practice (Murray et al., 2016). The use of the term MUS has also been a source of controversy and continued debate due to concerns of perpetuating bias, stigma, and discordant or ineffective treatment approaches (Marks & Hunter, 2015). Further complications for understanding this phenomenon relate to various diagnostic criteria that include inherent mind-body dualism. For example, symptoms unable to be categorized according to a specific disease are often automatically assumed to indicate a mental disorder, such as somatic symptom disorder (Murray et al., 2016). In addition, functional labels – such as irritable bowel syndrome or tension-type headaches – are often used by providers for these types of symptom clusters or syndromes that would fall under MUS. This phenomenon is also characterized by patient experiences of feeling their symptoms are dismissed, ignored, or invalidated by their healthcare providers, impacting further care and prognosis (Dusenbery, 2018; Polakovská & Řiháček, 2021). Despite diagnostic inconsistencies and varying terminology across research, the phenomenon of MUS is clearly documented as an area requiring further investigation, especially from a health psychology perspective.

MUS describes symptoms or syndromes without a known biomedical origin, characterized by an absence of objective test findings and an inability to explain them through structural or organic disease processes. It is important to note that the distinction of "unexplained" symptoms is a generalization of complex and nuanced factors and experiences. While symptoms are typically differentiated as either medically "explained" or "unexplained" based on known biological origins and treatments, the reality of symptoms and how each individual experiences them is more continuous and interconnected. For example, continued advances in cognitive neuroscience have demonstrated that all symptoms are processed along convergent pathways in the body and brain, regardless of the origin of those symptoms (Barsky & Silbersweig, 2023). Recent literature have also demonstrated that the experience of "unexplained" symptoms can actually be explained by various systems in the body despite deviating from known biomedical models of conditions (Alme et al., 2023; Reme, 2024). Specifically, they tend to lack specific biomarkers or biological pathology and present with overlapping symptoms to other conditions (Alme et al., 2023). While MUS is not a diagnostic term and should be used intentionally and with caution (Scott et al., 2022), it does encompass several formal diagnostic terms as well as a broader phenomenon that has been a significant source of burden for patients, providers, and the healthcare system (Olde Hartman et al., 2017).

There are several other terms used throughout the literature and practice to describe the same broad phenomenon, which may further complicate how MUS is understood and managed. Some of these terms include persistent physical symptoms (PPS), functional somatic symptoms (FSS), and nonspecific, functional, and somatoform (NFS) bodily complaints or syndromes. The term "non-specific" typically refers to symptoms that cannot be categorized as belonging to a specific disease (Murray et al., 2016). Meanwhile, the term "functional" is used to describe symptoms that cannot be classified as "structural" – or linked to structural changes in the body, such as muscle or ligament strain in the case of back pain (Roenneberg et al., 2019). When used alone, the term “somatic” refers to symptoms relating to the body and typically infers distinction from the mind. However, the terms “somatoform” and “somatoform type disorders” generally are used to refer to mental health symptoms that result in physical bodily symptoms due to psychological distress (Fors et al., 2012). The term “psychosomatic” is also often used to describe symptoms that are caused or aggravated by mental factors, such as internal conflict or stress. There is a significant overlap between these terms. For example, somatoform-type disorders are viewed as analogous to NFS and “non-specific” is often used to describe MUS (Murray et al., 2016). The variety of terminology and diagnostic labels may represent the general uncertainty and lack of cohesive frameworks for diagnosing and treating these conditions.

While MUS continues to be widely used in the literature, the American Psychiatric Association explicitly rejected the use of the term in 2013 with the release of the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) to better reflect the integrated nature of symptoms and discourage dualistic diagnostic decisions (American Psychiatric Association, 2013). The DSM-5 also replaced “somatization” with “somatic symptom disorder.” Somatic symptom disorder is defined by the presence of one or more somatic symptoms that a) cause distress and/or significant impairment in daily life, b) are associated with excessive thoughts, feelings, or behaviors related to those symptoms, and c) persist for more than six months (American Psychiatric Association, 2013). The World Health Organization (WHO) also chose to replace “somatization” with “bodily distress disorder” in the updated International Classification of Diseases (ICD-11) (Gureje & Reed, 2016). Bodily distress disorder is defined by the presence of distressing bodily symptoms, with excessive attention directed towards those symptoms, and is not alleviated through additional clinical examination and testing (Gureje & Reed, 2016). The diagnosis of bodily distress syndrome has been recommended to fill the parallel of somatic symptom disorder in primary care settings (Goldberg et al., 2016). While there is overlap between these diagnoses, they are not synonymous.

Alternative terms and diagnostic classifications for MUS have continued to emerge at a surprising rate over recent years. Additional labels that may be used in the literature include “functional disorders,” “psychogenic disorders,” or “psychosomatic symptoms.” None of the terms used to name diagnostic uncertainty do so without also implying psychological origins or assumptions (O'Leary & Geraghty, 2020). Consequently, the terminology used to define and describe MUS further perpetuates mind-body dualism due to these assumptions. Even if the symptoms are primarily caused or exacerbated by psychosocial factors, this bias in the assessment of symptoms has the potential to negatively impact patient care and well-being, especially given the high prevalence of these experiences.

Although MUS should not be used as a diagnostic term and presents limitations and some controversy, there continues to be value in the broader classification that the term represents. Notably, the term PPS has grown more favorable MUS in recent years to reflect a growing understanding of the phenomenon and reduce stigma around these experiences (Burton et al., 2024; Marks & Hunter, 2015). For this dissertation, the term MUS will be used to broadly encompass the various terms and descriptions that share the same phenomenon of lacking clear medical explanation, creating a burden for the healthcare system and patients that experience these symptoms, and often being attributed to psychosomatic origins by providers. The term is also being used to describe the common experience reported by patients who feel their symptoms are dismissed, ignored, invalidated, or not taken seriously by their healthcare providers (Dusenbery, 2018; Polakovská & Řiháček, 2021). The term MUS encompasses difficulty applying an appropriate diagnosis, compared to other terminology, which is a necessary component to capture.

Since one component of MUS is the difficulty in identifying appropriate diagnoses, it is essential to use MUS to investigate the broader impact of this phenomenon beyond individual diagnoses like fibromyalgia or chronic back pain. Being able to classify symptoms and experiences as MUS is vital for providing explanations to patients, guiding clinical decision-making, and furthering research (Olde Hartman et al., 2017). This is also congruent with patients' desire to understand and make sense of their symptoms (Kornelsen et al., 2016; Nettleton et al., 2005). MUS as a classification is an initial step that may help guide treatment and/or support for self-management of symptoms (Olde Hartman et al., 2017). The choice to use the term MUS to capture this complex phenomenon in the present dissertation is made with acknowledgement of the limitations and concerns associated with the term.

1.2 Prevalence and Incidence of MUS

Symptoms lacking clear or known medical explanation or etiology are estimated to account for approximately 20-50% of primary care consultations (Goldberg & Bridges, 1987; Haller et al., 2015; Husain & Chalder, 2021; Knapp et al., 2011; Steinbrecher et al., 2011), with a broader range of 11-86% documented in the literature (Johansen & Risor, 2017; Kroenke & Mangelsdorff, 1989; Swanson et al., 2010). In one western setting, MUS accounted for two-thirds of all reported symptoms in primary care clinics, with the highest rates being found in women, younger individuals, and non-native English speakers (Steinbrecher et al., 2011). More recent prevalence estimates, including those specific to the United States, are unavailable currently. Despite the wide range of prevalence estimates and lack of updated epidemiological information in the literature, cases lacking diagnostic clarity are recognized as highly common in everyday medical practice and are thought to make up about 50% of patients seen in outpatient settings (O'Leary & Geraghty, 2020).

1.3 Rates of Misdiagnosis

General estimates outside of MUS suggest that diagnostic errors occur in approximately one out of seven encounters (approximately 14%) between a provider and a patient (Scott & Crock, 2020). A review of diagnostic evaluation studies found 8.8% of MUS to be classified as a misdiagnosis upon natural follow-up with a median duration of 42 months (Eikelboom et al., 2016). Classification of misdiagnosis was based on identifying a medical or somatic diagnosis for symptoms previously labeled as FSS. As noted previously, FSS falls under the umbrella of MUS and is defined as bodily complaints without a clear etiology or unable to be explained by known somatic pathology (Eikelboom et al., 2016). Other research highlights misdiagnosis as commonplace under the broad classification of MUS and cites incorrect provisional diagnoses occurring in approximately one-fifth to one-third of cases (Nimnuan et al., 2001; Scott & Crock, 2020). Despite limited data and difficulties associated with classifying misdiagnoses related to MUS, the available estimates highlight that misdiagnoses do occur, and this may have adverse implications for patient well-being, the patient-provider relationship, and healthcare utilization.

From the medical perspective, it is thought that “psychosomatic” symptoms, or symptoms caused or exacerbated by mental factors such as stress, are often misdiagnosed as a biomedical disease and given subsequent unnecessary or ineffective medical treatments. This process is termed “medicalization” by the medical community and is used to support the argument that MUS should be more quickly identified as psychosomatic to avoid unnecessary testing and potential misdiagnosis (Baloh, 2020). Perpetuated by reductive perspectives that continue to associate MUS with psychological etiology, the “medicalization” of psychosomatic symptoms is seen as burdensome for patients, providers, and the healthcare system more broadly. However, evidence supporting psychosomatic factors being misdiagnosed as a biomedical disease is lacking.

The rates of misdiagnosis among MUS experiences may also vary depending on time, symptom severity, and specific diagnoses. For example, a UK-based study of 233 individuals with lupus, an autoimmune condition, found the average time to receive a diagnosis was nearly seven years, with 67% reporting at least one misdiagnosis, 47% of which were classified as mental health or “non-organic” diagnoses (Sloan et al., 2020). Most studies investigating MUS longitudinally do not sustain follow-up for seven years to track symptoms and diagnoses. MUS tends to be persistent and frequently remains unresolved, making it challenging to track and assess potential misdiagnoses. A prospective cohort study found that 43% of patients continued to suffer from their initial complaints at 12-month follow-up, with 57% of all symptoms remaining “unexplained” (Koch et al., 2009). It is essential to highlight that a primary limitation of follow-up studies on MUS is the low percentage of successful follow-up. Previous research has documented that approximately 90% of patients with unexplained symptoms do not revisit their provider within one month of their consultation (Kroenke & Jackson, 1998). It is unclear if more recent estimates of follow-up are available. However, these results indicate potential limitations of follow-up studies lacking findings for individuals who do not return. These factors have implications for research investigating rates of misdiagnosis, including limits to generalizability and potential deficits in how results are interpreted.

Patient narratives frequently report having symptoms dismissed and then later, typically after several years, diagnosed as something else (Dusenbery, 2018). However, even some of these diagnoses tend to fall under the MUS category due to the lack of known organic etiology.

Examples include fibromyalgia, chronic fatigue syndrome, and chronic low back pain. While these are recognized diagnoses and may even have typical courses of treatment, they are still characterized by the essence of MUS classification, namely assuming the lack of biological etiology and attributing psychosomatic origins to symptoms. Still, missing or delaying these diagnoses can negatively impact patient care and healthcare utilization.

Rates of misdiagnosis typically refer to missing an important "medical" diagnosis accompanied by recommended treatment protocols, which could be potentially life-threatening, depending on the condition. However, sources of error in MUS are more complex than just the possibility of missing a somatic illness. Errors of over-diagnosis, under-diagnosis, and misdiagnosis are all problematic for the patient and the healthcare system more broadly, as they contribute to patient dissatisfaction, increased healthcare utilization, and associated costs. In addition, a variety of factors, such as patient gender and mental health history, may also influence the accuracy of MUS-related diagnoses.

High incidence rates and evidence of the high potential for misdiagnosis illustrate part of the issue MUS presents. Given the general complexity of diagnosing these types of symptom presentations, these symptoms may be difficult for providers to manage and understand. If symptoms are not appropriately diagnosed, patients are presumably not connected to appropriate treatment and symptom management. These issues pertaining to MUS, especially how these symptoms are diagnosed and subsequently managed, have severe implications across multiple ecological levels, including the healthcare system, relationships and interactions between patients and providers, and individual patients and providers.

1.4 Implications of MUS

Complexity in Classification of MUS

MUS and rates of misdiagnosis present several challenges and associated implications for patient well-being, providers, patient-provider relationships, and the healthcare system. Many of the impacts depend on the individual case and related diagnostic factors. For example, there may be different implications in a situation where MUS is missed compared to incorrectly classifying symptoms as MUS. There are many instances where a diagnosis that falls within MUS would be appropriate and necessary, especially given what is known about the intersection between mental and physical health and how mental health concerns can manifest in the body (Sowers et al., 2009).

Correctly identifying when MUS-related diagnoses are appropriate can help avoid unnecessary and potentially invasive testing that may be linked to iatrogenic consequences, or harm caused by medical examination or treatment (Husain & Chalder, 2021). It can also help avoid time delays in identifying an accurate diagnosis and treatment plan, including potential referral to behavioral health for treatment and support if appropriate (Houwen et al., 2020). If a MUS-related diagnosis is appropriate but is not made, it may lead to increased suffering for the patient (Husain & Chalder, 2021; Jackson & Passamonti, 2005).

Even when a MUS-related diagnosis is appropriate, there are barriers to treatment receptivity that may impact care and outcomes. These may include stigma and biases related to MUS, psychosocial factors, behavioral health treatment for both patient and provider, the relationship dynamic between a patient and their provider, provider knowledge of how to treat MUS, access to appropriate treatment options, and a patient’s sense of their symptoms being validated and taken seriously regardless of their origins (Lehmann et al., 2021; Lipsitt et al., 2015). The patient-provider relationship is likely critical as it ties together the impact of stigma and bias and the patient’s perception of care. For example, a negative relationship dynamic where a patient feels their concerns are dismissed or invalidated may be more likely to result in the patient not following through with treatment recommendations, including a behavioral health referral (Mariman et al., 2021). It may also contribute to the phenomenon known as “doctor shopping,” where patients seek care from multiple healthcare providers for a multitude of reasons, including feeling like their concerns aren’t taken seriously (Sansone & Sansone, 2012).

While providers are often encouraged to identify symptoms as medically unexplained more quickly to connect patients to behavioral health interventions, it may backfire depending on the relationship and communication factors between patient and provider (Eikelboom et al., 2016). Suppose the patient feels their symptoms are being invalidated or dismissed, leading them to ignore recommendations from their provider and seek a new doctor. This not only drives up healthcare costs due to higher utilization but also causes delays in both medical intervention and effective symptom management. The problem likely stems from other factors such as negative attitudes and perceptions, stigma, biases, and ineffective communication (Scott et al., 2022). Patients are likely still unsatisfied and left to deal with distressing symptoms; providers are either unaware of the outcomes or further frustrated themselves. The healthcare system continues to be burdened by costs associated with navigating care for patients with MUS. Pairing behavioral health treatment with MUS has the potential for great benefits and is often an appropriate option (Kleinstäuber et al., 2019).

There are also instances where a MUS-related diagnosis is given but may be inaccurate, inappropriate, or premature, given without appropriate evidence. This can lead to missing potentially life-threatening conditions with clear treatment implications, inappropriate treatment recommendations, continued or worsening suffering, additional healthcare costs, doctor shopping, and more (O'Leary, 2018). Provider biases are one factor that may contribute to an increased likelihood of attributing symptoms to psychosomatic origins, and potential error in this attribution. Patient gender and mental health history are two such biases. As will be described in greater detail below, female patients are more likely to have symptoms attributed to psychosomatic origins and less likely to receive additional testing (Samulowitz et al., 2018). In addition, there are evident connections between MUS and mental health that make it likely for mental health factors to lead to additional potential bias when providers are assessing symptoms (Nimnuan et al., 2001).

The issue with diagnosing and treating MUS is multifaceted and complex. Simple solutions, such as quicker identification of symptoms, are likely not effective for addressing the burden associated with MUS. This dissertation aims to investigate how specific patient characteristics (i.e., gender and mental health history) impact provider diagnostic and treatment decision-making for MUS. This is just one aspect of the larger issue to provide additional insights to guide improvements in clinical practice. Until more comprehensive solutions are effectively implemented, implications of MUS will likely continue to negatively impact the healthcare system, healthcare providers, patient well-being, and the patient-provider relationship, among other aspects of healthcare.

The Burden of MUS on the Healthcare System

There is a large consensus that MUS continues to be a significant burden on the healthcare system, partly due to MUS being a significant cause of morbidity (Barsky et al., 2005; Bermingham et al., 2010; Isaac & Paauw, 2014). Additional burdens to the healthcare system include high utilization of healthcare services and associated costs over a prolonged period of time. For example, a retrospective cohort study found that healthcare utilization of patients with

FSS continued to increase over 15 years (Schneider et al., 2021). Healthcare utilization was even higher among patients who lacked coordination of care by their primary care providers.

Somatoform disorders, which are often assumed to explain the majority of MUS and are defined as mental health disorders that result in physical bodily symptoms from psychological distress, have been estimated to cost billions of dollars annually (Gustavsson et al., 2011). Somatoform symptoms and disorders have also been connected to increased healthcare utilization across departments, including primary care, specialty care, and the emergency department (Barsky et al., 2005). Specifically, patients with somatization were found to use outpatient and inpatient services twice as much as patients without somatization. They were also found to have approximately double the annual healthcare costs, independent of psychiatric and medical comorbidity (Barsky et al., 2005). Furthermore, there is evidence that greater resource utilization can prevent appropriate care and exacerbate NFS (Murray et al., 2016).

There are also concerns that unnecessary treatment may increase dependence on medical care, and thus lead to further healthcare utilization and costs (Salmon et al., 2007). Patients with functional somatic symptoms have been shown to have higher rates of radiography, imaging such as CT scans and MRIs, and outpatient surgery compared to controls (Schneider et al., 2021). This increases the risk of potentially harmful and costly diagnostic testing and unnecessary outpatient surgery (Schneider et al., 2021). These risks support the common medical argument to identify MUS as psychosomatic sooner to avoid extraneous burden on the healthcare system (Chew-Graham et al., 2017; Smith, 2020).

The Burden of MUS on Healthcare Providers

Healthcare providers consistently report difficulties and find consultations involving MUS challenging (Houwen et al., 2020; Johansen & Risor, 2017; Salmon et al., 2007). The burden providers experience is likely multifaceted and due to the general complexity of MUS. Providers must consider multiple competing interests and expectations that often conflict. For example, providers need to balance the concerns of unnecessary testing and iatrogenic risks with the risks of missing a potentially life-threatening physical disease (Warner et al., 2017). This balance, accompanied by the uncertainty and unknowns of MUS, likely contributes to the stress providers report experiencing when confronted with these symptoms. It is possible that providers' view of MUS as burdensome translates into negative attitudes towards patients dealing with MUS, which may further impact a provider's clinical judgment.

A qualitative study reported how providers feel unprepared to deal with MUS, viewing MUS as frustrating and challenging to manage (Wileman, 2002). In healthcare settings, providers often hold more power in interactions with patients. However, when confronted with MUS, many providers report a shift in power dynamics and a sense of powerlessness. In addition, some providers report feelings of resentment towards patients with MUS (Wileman, 2002). Providers also tend to conceptualize MUS as a result of the medicalization of distress and inability to tolerate somatic symptoms. Furthermore, they report viewing patients with MUS as "problematic" due to their symptom presentations and perceived resistance to medical advice and treatment (Wileman, 2002). While this qualitative study is now somewhat dated and has limitations in generalizability due to a smaller sample size, the findings are consistent with more recent studies and highlight the critical implications of MUS on providers.

For example, a recent narrative review reported consistent themes of healthcare providers' negative attitudes and perceptions toward patients with MUS (Mariman et al., 2021). One qualitative study in the review highlighted how medical students reported difficulty viewing an illness as "real" without a known physical cause or diagnostic test (Stenhoff et al., 2015). The medical students reported viewing these types of illnesses as “difficult,” “frustrating,” and “intimidating” to manage, given the associated complexity and “invisible” nature. They also reported difficulty understanding these types of illnesses within a traditional biomedical framework (Stenhoff et al., 2015). Another study included in the review found that providers described patients with MUS as “impossible” to treat and questioned the legitimacy of their demands on healthcare resources, including the provider’s time (Wilkins et al., 2018).

A recent survey of primary care providers (PCP) found that providers continue to perceive patients with MUS as burdensome (Lehmann et al., 2021). Providers report feeling pressure to explain symptoms to patients and deliver effective treatment. This perceived pressure is referenced as a common diagnostic and treatment barrier among providers. In addition, providers report finding diagnosis, treatment, and management of MUS ambiguous and challenging due to a collective lack of knowledge, particularly related to treatment guidelines (Lehmann et al., 2021).

There is some evidence that the burden providers experience related to MUS translates into implications for patient care and well-being. For example, providers often prescribe psychotropic medications despite scarce evidence that pharmacological interventions improve MUS (Lehmann et al., 2021). In addition, providers often need to be more informed about the role of psychologists in managing MUS despite rating psychological interventions as very useful for these patients (Sirri et al., 2017). If psychological intervention is considered the best practice, a provider’s lack of knowledge or comfort may impede appropriate referrals and subsequent treatment.

Patient Well-Being

Individuals with MUS are accustomed to having their symptoms dismissed or not being taken seriously by healthcare providers. Dismissive comments, such as “it’s all in your head,” are highly prevalent and may lead to increased harm, even if the comments can be considered technically accurate (Burke, 2019). Statements like the one above become dismissive and ignore the vast complexity of the connections between the brain and the body. Even in the absence of this type of statement, encounters that lack a known medical diagnosis have been described as “awkward” and leave patients to infer that their symptoms are “all in their head.” Some patients may even infer that their provider thinks they are malingering or “faking it” (Robson & Lian, 2017). Furthermore, these types of encounters are also described as resulting in the perpetuation of unnecessary disability and further strain on healthcare resources, as noted previously (Burke, 2019; Scott et al., 2022).

The relationship dynamics between patients and providers in these encounters likely contribute to patients’ reports of concern that provider so not take their symptoms and experiences seriously (Houwen et al., 2017). Meanwhile, the experience of MUS is distressing and often causes severe impairment for patients dealing with them (Jasper et al., 2012). MUS is also linked to a lower quality of life (Feder et al., 2001). A qualitative study exploring patient perspectives on living with MUS found variations in well-being depending on how the patient experienced or explained their symptoms, how they coped, and their expectations of the healthcare system (Sowińska & Czachowski, 2018). For example, the findings suggested that increased acceptance and acknowledgment of psychological symptoms may be empowering for some patients (Sowińska & Czachowski, 2018). However, some research has also demonstrated that perceiving a psychological cause of MUS is associated with more negative health outcomes and more negative emotional coping (McAndrew et al., 2019). These conflicting findings highlight the complexity associated with psychological explanations and treatment options for MUS.

Existing literature on patient experiences with MUS has repeatedly shown that patients often wish to make sense of their symptoms (Kornelsen et al., 2016; Lidén et al., 2015; Nettleton et al., 2005; Olde Hartman et al., 2017; Sowińska & Czachowski, 2018). A qualitative study found that patients with MUS sought validation of their symptoms through naming, even if naming did not fully recover symptoms (Kornelsen et al., 2016). Furthermore, they perceived "system disengagement" in the absence of a diagnosis or when a diagnosis is prolonged. Patients characterized system disengagement as getting lost or forgotten in the healthcare system and experiencing active discrimination and disrespect. Patient accounts of subtle gestures, such as eye-rolling, implications of malingering, and dismissive or degrading comments supported the latter. Patients also described feeling angry in response to providers suggesting the absence of a diagnosis as an indication for a psychiatric diagnosis. Despite general openness to exploring psychosocial connections, patients noted fears due to social stigma associated with psychiatric concerns (Kornelsen et al., 2016). Many patients also reported experiencing self-doubt and questioning in response to repeated dismissive comments (Kornelsen et al., 2016).

A recent qualitative study investigating symptom management perspectives from patients with fibromyalgia in France revealed gaps in care and challenges perpetuated by the patient-provider relationship (Kachaner et al., 2023). For example, patients reported significant suffering and functional impairment as well as constant fear of not being heard or believed by providers. Furthermore, patients noted loss of control exacerbated by imbalances in their relationships with providers (Kachaner et al., 2023).

Patient-Provider Relationship

The patient-provider relationship is crucial in situations involving MUS. A qualitative meta-analysis identified patient-provider relationships as a critical factor impacting patient experiences with MUS (Kornelsen et al., 2016). Many patients with MUS report their relationship with their PCP as an anchor for navigating their experiences and symptom management. Furthermore, positive relationships between patients and providers have been shown to mitigate the challenges associated with a general lack of clarity in relation to MUS. Patients describe experiences related to positive relationships as including feeling respected by their provider and having their symptoms and use of healthcare validated (Kornelsen et al., 2016).

Most importantly, patients report feeling heard as a key component of a positive therapeutic relationship with their doctor. Many described a “glassy-eyed look” from providers that they interpreted as disinterest, resulting in them not feeling heard and altering their overall perception of the patient-provider relationship (Kornelsen et al., 2016). Positive therapeutic relationships characterized by effective communication and partnership are considered the foundation of healing for MUS (Kornelsen et al., 2016).

While a positive patient-provider relationship can lead to beneficial implications for patients, providers, and the healthcare system more broadly, there is also evidence that MUS has negative implications on the patient-provider relationship (Mariman et al., 2021). For example, discordance in the relationship is a typical result of patients with MUS needing to engage in self-advocacy or challenge diagnostic and treatment decisions from their provider (Kornelsen et al., 2016). While patients may feel the need to advocate for themselves, this may also lead to providers feeling controlled or dominated by patients with MUS, which has been shown to impact the course of a consultation negatively (Murray et al., 2016). This issue of discordance is exacerbated by patients and providers having differing views of symptom etiology, which may have negative implications on the patient-provider relationship through emotional consequences (Chew-Graham et al., 2008; Greer & Halgin, 2006). For example, some providers report fear of adverse consequences if they suggest to a patient that their symptoms are influenced by psychosocial factors (Lundh et al., 2004; Wainwright et al., 2006). Both patients and providers frequently perceive negative experiences related to managing MUS in primary care consultations. These negative experiences then create difficulties in the patient-provider relationship (Houwen et al., 2020).

1.5 Historical Roots of MUS

As with many phenomena, the classification of MUS is rooted in a historical context that has continued to shape current medical practice. One such context is the diagnosis of "hysteria." Hysteria is also described as the first mental disorder attributable to women, dating back almost 4,000 years (Tasca et al., 2012). The first description is attributed to ancient Egyptians and references hysterical disorders being caused by spontaneous uterus movement in women's bodies (Soule, 1951). The Greek physician Hippocrates was the first to use the term "hysteria" in the 5th century BC (Tasca et al., 2012). The term itself is derived from the Greek word for uterus. Like ancient Egyptians, Greek physicians believed the disease was the result of abnormal movements of the uterus in the body, or a "wandering uterus" (Tasca et al., 2012).

The concept that the uterus could physically move around a woman's body because of some deficiency has perpetuated gender biases rooted in women being portrayed as "erratic." Many Greek physicians believed that a woman's "madness," which they labeled hysteria, resulted from a lack of sexual satisfaction (Tasca et al., 2012). The early treatments for hysteria often centered around sexual stimulation through vaginal penetration. Women were instructed to have sex with their husbands, and if they were not married, they were instructed to marry (Scull, 2009). While the origins of hysteria were attributed to the uterus, suspected causes of unknown symptom clusters - particularly those that would now be understood as mental health concerns - ranged from being possessed by the devil in the Middle Ages to being related to the brain and the nervous system in the 16th century (Tasca et al., 2012). It was even connected to the accusations, and hangings of those accused, of witchcraft in Salem, Massachusetts during the 17th century (Wing, 2017). In the 18th century, experiences of hysteria started to be more clearly connected to societal expectations for women and the belief that the disease was a result of moral and physiological imbalances when women broke away from expected societal standards (Duby & Perrot, 1991). Psychotherapy-type treatments for hysteria first emerged in the Middle Ages. However, trends of stigma related to women and mental health concerns continued to influence the conceptualization and treatment of hysteria well into the 21st century (Tasca et al., 2012).

Hysteria has included a multitude of non-specific symptoms that were attributed to the diagnosis, including dizziness, fatigue, weakness, generalized pain, headaches, emotional outbursts, and cognitive impairments (Baloh, 2020). While hysteria is no longer acknowledged or accepted as a formal diagnosis, the history of the diagnosis continues to impact current healthcare practices, primarily in relation to medically unexplained, functional, or psychological symptoms that present in women. Our current understanding of hysteria describes a phenomenon of women's symptoms being dismissed or labeled as psychosomatic in origin (Dusenbery, 2018). While the gender differences and stereotypes perpetuated by hysteria are particularly pronounced for women, they can also be linked to the underdiagnosis of mental health conditions, including depression, in men. Differences in gender norms related to mental health concerns and symptom presentations—men present with different symptoms of depression compared to women—

contribute to this continued pattern of underdiagnosis and inverse impact of hysteria (Call & Shafer, 2018; Smith et al., 2018). Another bias stemming from the history of hysteria and MUS relates to mind-body dualism and assumptions that something lacking a clear medical explanation is "all in your head" or solely attributed to psychological origins.

1.6 Biomedical Versus Biopsychosocial Perspectives

Despite its being outdated, western societies continue to be primarily guided by mind-body dualism, as evidenced by growing research and understanding highlighting the integrated nature of physical and mental health (Taylor, 2011). While integrated behavioral healthcare, rooted more in the biopsychosocial model of health, is recognized as invaluable and considered best practice for primary care settings, the biomedical model continues to be predominant in practice. This is evidenced by continued siloed care, particularly between general and specialty providers, and continued criticism of limitations to the biopsychosocial model (Papadimitriou, 2017). Despite meaningful strides toward integrated behavioral healthcare and more holistic care, there are still barriers to full integration (Grazier et al., 2016). One such barrier is that mental health concerns continue to be subject to siloed treatment in most settings, which further perpetuates negative social stigma towards mental health concerns and impacts the types of treatment individuals can access.

Most medical providers are trained based on reductionist biomedical models that assume all diseases can be reduced to a biological cause and that the treatment for those diseases would also focus on biological aspects, such as surgery or medication (Rocca & Anjum, 2020). Reductionist models tend to focus solely on dualistic perspectives. Cognitive and social psychology concepts further support these perspectives and why they are so prominent and challenging to overcome. For example, social psychology explains how the use of heuristics, or mental shortcuts, helps guide and influence decision-making processes in social interactions (Finkel & Baumeister, 2019). It is also recognized that heuristics have a high potential to be influenced by biased assumptions. Common cognitive distortions, such as “all-or-nothing” thinking, also highlight the prevalence of dualistic thinking (Leahy, 1996). These thinking patterns then contribute to internalized biases that impact how providers label and treat symptoms. The lack of integration of physical and mental health presents barriers to holistic conceptualizations of disease models and treatment approaches. It also presents a barrier to diagnosing and treating individuals who suffer from persistent MUS (Murray et al., 2016).

The predominance of the biomedical model of disease is evident from both physician and patient perspectives. For instance, patients with MUS often emphasize their physical symptoms and expect medical treatment rather than psychological intervention (Dwamena et al., 2009). Many fear that mentioning psychosocial factors could shift their provider’s focus away from potentially serious medical conditions (Peters et al., 2009). Additionally, some patients may lack psychological insight, leading to resistance in attributing symptoms to psychological causes. This resistance is often linked to fears of social stigma and negative consequences associated with psychosocial explanations for their somatic symptoms (Murray et al., 2016).

Instead of viewing the origin of symptoms as either organic or psychosomatic, a more comprehensive approach could focus on the impact of the specific symptoms on a patient’s overall functioning and quality of life and specifically look for points of intersection between physical and mental health concerns. Physical health symptoms can be distressing and contribute to mental health concerns. Similarly, mental health concerns can cause or exacerbate physiological symptoms. Both are true and neither makes the symptoms one is experiencing invalid. Yet, dualistic perspectives continue to be the standard approach to treating symptoms that present with comorbid physical and mental health concerns, including in the context of MUS, when there is an absence of a known biological cause. The biopsychosocial model is thought to be useful for physicians in helping them understand and manage MUS. As such, it has been recommended that medical students spend more time learning about medicine from a biopsychosocial lens to better incorporate an integrated perspective into patient care (Rasmussen & Rø, 2018).

Despite limitations and barriers, research continues to highlight the utility of the biopsychosocial model as a more appropriate framework for understanding the factors that contribute to health and well-being as well as disease and illness (Farre & Rapley, 2017). Initially introduced by George Engel, the biopsychosocial model was presented as an alternative to the biomedical model to accommodate illness's social, psychological, and behavioral components (Engel, 1977). The biopsychosocial model posits that there are biological, psychological, and social dimensions of health and illness. This model continues to acknowledge the biomedical approach's value while emphasizing the importance of giving equal attention to psychological and social factors (Farre & Rapley, 2017). Despite its introduction over 40 years ago and widespread acknowledgment, there are continued difficulties in implementing the biopsychosocial framework into practice (Papadimitriou, 2017). The assessment and treatment of MUS is one example of this continued challenge.

The biopsychosocial model lends strength to recognition of the high comorbidity between somatic symptoms, including those labeled as MUS, and mental health concerns. For example, one study found that half of the individuals dealing with PPS also suffered from associated anxiety or depression (Nimnuan et al., 2001). Mind-body dualism may perpetuate the narrative that symptom etiology, or the cause of the symptom, is separate or that symptoms should be attributed to either the body or the mind. This perspective continues to suggest that unexplained physical symptoms are the result of mental health concerns. A more accurate perspective would be to assume integration and overlap of symptoms, consistent with the biopsychosocial model. Full integration would recognize a fluid dynamic between mental and physical health rather than seeking to define symptom etiology as either biological or psychological. Despite some growth in viewing the reality of symptoms and experiences being integrated, mental health concerns are still treated differently than physical health concerns. This issue is perpetuated by mental health stigma that is highly prevalent in healthcare settings (Maranzan, 2016).

1.7 Mental Health Stigma in Healthcare Settings

Given the high comorbidity between MUS and mental health concerns, it is likely that mental health stigma has negative implications on provider diagnostic and treatment-based decision-making for patients with MUS. Mental health stigma has been consistently reported among the general population over the past 40 years and has been shown to limit help-seeking behavior and treatment of mental health concerns (Clement et al., 2015; Mackenzie et al., 2014). Mental health stigma is also highly prevalent in healthcare settings, perhaps more so than in the general population, despite providers having greater knowledge and understanding than the general population (Maranzan, 2016). Stigmatization of mental health concerns remains widespread among healthcare professionals and systems across the globe and has negative implications for the provision of care and health outcomes of the patient (Raj, 2022).

Stigmatization of mental health concerns is associated with lower quality healthcare delivery (Kane et al., 2019). A survey conducted by the Mental Health Foundation found that nearly half of individuals with mental illnesses felt they were being dismissed or discriminated against by their healthcare providers (Chadda, 2000). More recent estimates of perceived discrimination by healthcare providers are currently unavailable. However, there are more recent findings that suggest individuals who perceive mental health discrimination often feel that it negatively impacts their mental health (Hamilton et al., 2016). A survey of individuals with mental illness found that health professionals were frequently cited as a source of discrimination (Corker et al., 2013). Another study found that patients with mental illness reported being treated with disrespect, experiencing longer wait times compared to other patients, and feeling like their physical complaints were being treated as “imagined” (Schulze & Angermeyer, 2003).

The extent to which providers stigmatize mental health concerns can negatively impact patient care, regardless of whether the stigma was intentional or not (Oliver et al., 2005). For example, stigma can cause providers to prioritize other symptoms that they perceive as more important. This may contribute to dismissing or ignoring concerns that a provider attributes to psychological factors in favor of other concerns that may be viewed as more ‘valid.’ One problem with this is it may lead to false attribution of complaints to psychological factors despite being unrelated to mental health concerns. Mental health stigma can also negatively impact the patient-provider relationship, which can have further negative effects on care and outcomes. Finally, stigma can result in patients being treated differently based on their mental health (Jones et al., 2008; Oliver et al., 2005).

Given the rise of mental health concerns over the past two decades (Twenge et al., 2019) and the continued trends in societal stigma and misunderstanding about mental health, it is unsurprising that mental health discrimination in healthcare settings remains prevalent. A recent review highlighted findings that patients with mental health concerns feel disrespected by their healthcare providers (Knaak et al., 2017). They also reported feeling their credibility is judged based on how they describe their physical symptoms and that their concerns are often ignored by their providers (Knaak et al., 2017). Health professionals' attitudes towards mental health are thought to contribute to the stigmatization of individuals who seek treatment for mental health concerns (Waugh et al., 2017). In a sample of adults, a recent study found that mental health stigma, directly and indirectly, influences attitudes about mental health treatment, such that greater mental health stigma is associated with more negative attitudes towards treatment seeking. They also found that mental health stigma impacted an individual's physical health symptoms depending on their reported level of anxiety (Sickel et al., 2019).

A study investigating depression-related stigma among primary care providers found trends of higher stigma based on provider gender and training level (i.e., resident versus non-resident). Male providers were found to have higher stigma scores compared to female providers while residents were found to have higher stigma scores compared to non-residents (i.e., attending physicians). The study also found that providers with greater exposure to treating depression and with personal exposure to mental illness had lower stigma scores (Kluemper et al., 2021). These findings suggest that level and specificity of training to increase awareness of mental health factors, has the potential to decrease associated stigma. This is particularly important in the case of MUS given the overlap between somatic and psychological symptoms.

1.8 Provider Decisions Are Influenced by Patient Mental Health History

The term 'diagnostic overshadowing' has been used to describe a phenomenon experienced by individuals with mental illness who also have poorer physical health. These individuals' poorer physical health is thought to be partly due to healthcare professionals misattributing physical symptoms to the individual's mental illness (Jones et al., 2008). In the presence of diagnostic uncertainty, this presents concerns with how symptoms are assessed, diagnosed, and treated. It also highlights the potential for mental health concerns to create bias in the decision-making process, which could be either advantageous or disastrous. While some research and clinical guidelines encourage quicker identification of MUS to avoid iatrogenic harm, they also acknowledge that labeling symptoms as MUS too early may increase the risk of misdiagnosis, including missing diseases (Houwen et al., 2020). Previous research also found a higher risk of error associated with provider prejudice when applying the label MUS (Schulman et al., 1999; Todd et al., 1993).

Mental health concerns, such as depression and anxiety, have been highlighted among patient experiences with MUS as contributing to the dismissal or invalidation of other somatic symptoms (Dusenbery, 2018). Preliminary research suggests that a patient’s mental health history influences diagnostic and treatment decisions made by providers. For example, one study found that providers were less likely to investigate a patient’s severe headache or abdominal pain as a serious illness if the patient had a history of depression (Graber et al., 2000). Providers were also less likely to consider ordering additional tests for patients with a history of depression, compared to the same symptom presentation without a history of depression (Graber et al., 2000). A study focused on the Veterans Affairs (VA) medical system found that providers who endorsed greater stigmatizing characteristics of a male patient with schizophrenia were more likely to believe the patient would not adhere to treatment for low back pain due to arthritis, and were, therefore, less likely to refer to a specialist or refill his prescription (Corrigan et al., 2014). Another study found that including background information about a patient having a history of schizophrenia increased the number of mistakes providers made in their decision-making (Yamauchi et al., 2019).

While there are limited studies specifically investigating how a patient’s mental health history may impact the care they receive and how a provider interprets and makes decisions about their symptoms and experiences, it is an issue that warrants further investigation. The current research on this topic illustrates preliminary evidence that a patient's mental health history may be associated with bias in provider diagnostic and treatment decision-making. Additional research can help improve understanding of how a patient's mental health history may impact provider decision-making. This understanding could help inform efforts to address mental health stigma, practice guidelines, and reporting of mental health symptoms or disorders in electronic medical records. One aim of this study is to investigate how mental health history impacts provider diagnostic and treatment decision making for patients presenting with MUS. This is particularly important for MUS given the history and continued intersection with mental health concerns. If mental health history creates a bias among providers that then impacts how they diagnose and treat patients, it could have severe implications for patient well-being, including the potential of missing a life-threatening illness, in addition to other factors.

1.9 Role of Gender Bias

Beyond mental health history, other patient characteristics, such as sex and gender, are better documented regarding bias associated with provider decision-making for diagnosis and treatment approach (Samulowitz et al., 2018). While more research is needed to better understand the relationship and translate findings to improve clinical practice, these findings highlight that provider decisions are influenced by patient characteristics, particularly in the case of MUS. The terms "men," "women," and "gender" are used in this dissertation proposal to refer to sex assigned at birth and associated gender norms. It is important to recognize that sex and gender are two separate constructs, each existing more accurately on spectrums beyond these dichotomized labels. The term "gender" is used in this dissertation to capture associated gender norms with biological sex and how those influence gender biases in medical settings. While sex and gender hold their own complexities and requirements for additional research, there is an overwhelming amount of research depicting gender bias in healthcare.

While hysteria is no longer acknowledged as a credible diagnosis, women continue to face greater bias in medical settings, mainly when dealing with MUS. It is likely that this bias may be even greater for women coping with comorbid or past mental health concerns. There are several reasons thought to contribute to the trend beyond the hysteria phenomenon, including less research that has focused on female subjects. Therefore, our understanding of disease models and symptom presentations is based on male patients without sufficient consideration for potential gender differences. For example, myocardial infarction (i.e., heart attack) has recently been shown to produce different symptoms in women compared to men. Despite this new knowledge, women presenting to the emergency department experiencing a heart attack are still frequently turned away with their symptoms dismissed and attributed to an alternative cause, such as anxiety (Martinez-Nadal et al., 2021). One study found that women are two times more likely than men to be diagnosed with a mental health condition when their symptoms are consistent with heart disease (Maserejian et al., 2009). National statistics found that over 40% of women in the U.S. have heart disease, with it being a leading cause of death among women (National Center for Health Statistics, 2024a; Tsao et al., 2023). Even today, women continue to be underrepresented in research studies, particularly those investigating physiological systems in the body, due to the “complexity” and associated unknown factors of the female body that are thought to potentially confound study findings (Sosinsky et al., 2022).

There is a significant amount of evidence highlighting the inequalities women face in the healthcare system (Carrero et al., 2018; Heise et al., 2019; Samulowitz et al., 2018). For example, women are 50% more likely to be misdiagnosed than men (Hamberg, 2008; Wu et al., 2018). Women are also less likely to receive diagnostic investigation compared to men, even for symptoms that are more prevalent among women, such as respiratory symptoms (Groeneveld et al., 2020). Women have also been shown to receive less attention, be asked fewer questions, and receive less extensive examinations for symptoms of coronary heart disease (CHD) compared to men (Arber et al., 2006). Women are also less likely to receive additional diagnostic investigation and more likely to receive a diagnosis that would be classified as MUS compared to men (Arber et al., 2006; Loikas et al., 2015; Ruiz-Cantero et al., 2007).

There is also significant and growing evidence of providers displaying gender bias in the diagnostic assessment of MUS (Claréus & Renström, 2019). An observational cohort study found that women received fewer physical exams, diagnostic imaging, and specialist referrals compared to men. They were also less likely to receive a diagnosis for common somatic symptoms compared to men (Ballering et al., 2021). The same study found that diagnostic interventions mediated the relationship between patient sex and disease diagnosis, such that fewer diagnostic interventions were associated with fewer disease diagnoses in female patients (Ballering et al., 2021). A prospective cohort study found that male gender was the most significant predictor of MUS diminishing or being explained by the 12-month follow-up (Koch et al., 2009). This suggests that female patients, compared to male counterparts, are more likely to continue suffering from MUS and continue lacking insight and understanding into their symptoms.

A clear pattern of gender bias and gendered norms in the treatment of chronic pain has been identified in the literature (Samulowitz et al., 2018). Chronic pain is one of the most prevalent diagnoses under the broader category of MUS. Despite reported greater experiences of pain, women frequently receive less intensive and less effective care for their pain (Chen et al., 2008; Hoffmann & Tarzian, 2001; Lord et al., 2009; Roger et al., 2000). When presenting with pain, women are less likely to receive prescription pain medications but more likely to be prescribed antidepressants and be referred to behavioral health compared to men (Chen et al., 2008; Hirsh et al., 2014; Lord et al., 2009). Pain in women is also more likely to be treated as a product of a mental health condition, rather than a physical condition (Samulowitz et al., 2018).

Although there is a growing understanding of the physiological mechanisms, and thus biomedical etiology, chronic pain is still considered under the broader category of MUS. It is frequently described as challenging to fit into the traditional biomedical model, especially the symptom presentations dominated by women, such as when pain is the only symptom (Dao & LeResche, 2000; Grace, 2001; Samulowitz et al., 2018). Given that these symptoms often receive a low status in the medical hierarchy of diagnoses due to deviating from the norm, it frequently leads to women with these diagnoses being questioned as patients (Samulowitz et al., 2018). Women’s pain also tends to be psychologized by healthcare providers, which causes them to feel their pain is dismissed and may cause further stress (Hoffmann & Tarzian, 2001; Tait et al., 2009; Werner et al., 2004). According to hegemonic masculinity, psychological distress is considered to be feminine and is therefore belittled in comparison to somatic or biological conditions (Möller-Leimkühler, 2002). This turns into a negative cycle as providers take patients’ pain less seriously when they perceive the patient as experiencing stress (Tait et al., 2009).

Biases in healthcare associated with patient gender and mind-body dualism are likely sustained by the continued assumptions of stress and psychological distress as feminine and therefore attributed primarily to women (Samulowitz et al., 2018). In addition, despite increased efforts for behavioral health integration and adoption of the biopsychosocial model, healthcare continues to view a hierarchical structure between somatic or medical concerns and psychological concerns (Samulowitz et al., 2018). These biases rooted in gender norms will likely continue to exist and impact the quality of healthcare until they are more actively and adequately addressed.

1.10 Gaps in the Literature

Although existing literature highlights the influence of patient characteristics, such as sex/gender and mental health history, on the healthcare they receive, significant gaps remain in understanding how these factors affect provider decision-making for MUS. While mental health stigma in healthcare is well-documented – primarily by studies focusing on reducing stigma via targeted interventions – there is a critical lack of research exploring how a patient's mental health history directly influences diagnostic and treatment decisions for MUS in primary care. Notably, much of the existing literature on mental health stigma, particularly its impact on provider decision-making, is outdated or conducted outside of the United States. For instance, there is a scarcity of research evaluating how U.S.-based primary care providers approach clinical decision-making for patients with mental health histories (Kluemper et al., 2021).

These geographic and temporal limitations present challenges in the generalizability of findings, especially as healthcare systems, provider training, and cultural attitudes toward mental health vary considerably across countries (Krendl & Pescosolido, 2020; Wager & Cox, 2024; Weggemans et al., 2017; Zavlin et al., 2017). Consequently, it remains to be seen if these previous findings apply within the unique context of the U.S. healthcare system, where issues such as time constraints, insurance structures, and patient-provider relationships may further complicate the diagnosis and treatment of MUS.

Given that MUS is often accompanied by psychosomatic assumptions, which may further accentuate biases about a patient’s mental health history, the need for modern U.S.-based research is increasingly pressing to understand how these factors impact clinical decision-making. Moreover, given the documented intersection between gender and mental health stigma, it is essential to explore how these two characteristics - when present simultaneously - might uniquely shape provider decision-making and patient outcomes in cases of MUS. Understanding these dynamics could help inform targeted interventions to reduce bias and improve patient care, especially for those presenting with ambiguous symptoms.

1.11 Research Questions and Hypotheses

The purpose of the present study is to investigate how a patient’s mental health history and gender influence provider decision-making when faced with symptoms that do not fit within a typical presentation and appear to be “medically unexplained.”

Research Question 1 (RQ1): How does knowledge of a patient’s gender and mental health history impact provider diagnostic decision-making for MUS?

> **Hypothesis 1a**: Providers are more likely to suggest a MUS congruent diagnosis for a female patient with a known history of mental health concerns.
>
> **Hypothesis 1b:** Providers will indicate a smaller likelihood of a medical diagnosis for female patients with a history of mental health concerns.
>
> **Hypothesis 1c:** Providers will indicate a greater likelihood of a behavioral health diagnosis for female patients with a history of mental health concerns.

Research Question 2 (RQ2): How does knowledge of a patient’s gender and mental health history impact provider decision-making for treatment and follow-up likelihood regarding MUS?

Hypothesis 2a: Providers will indicate a smaller likelihood of medical testing and follow-up for female patients with a known history of mental health concerns.

Hypothesis 2b: Providers will indicate a greater likelihood for behavioral health referral/treatment for female patients with a history of mental health concerns.

CHAPTER 2: METHOD

2.1 Introduction

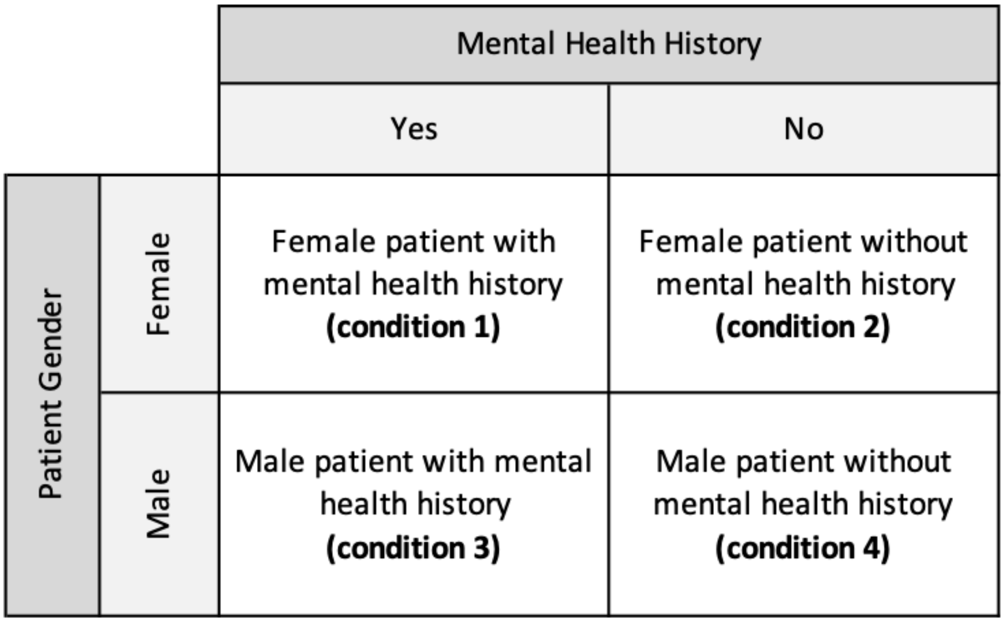
The present study aims to investigate the extent to which patient gender and a history of mental health concerns in patients presenting with medically unexplained symptoms (MUS) influence provider decision-making around diagnosis and treatment approaches. Physicians in primary care, family medicine, and internal medicine clinics were presented with vignettes describing patients with symptoms that do not fit a typical presentation of a condition with known biological origins. Once presented with a case describing MUS, providers answered questions about suspected diagnosis and what course of action they would take. This chapter describes and provides a rationale for the methodology used to address the previously stated research questions and hypotheses.

2.2 Rationale for Research Design

This study is a 2x2 factorial between-subjects design, with mental health history and patient gender being manipulated between conditions (Figure 1). Participants were randomized into one of four groups to determine which set of vignettes they were exposed to prior to answering questionnaires. Patient gender was depicted as either male (with he/him pronouns) or female (with she/her pronouns). Vignettes under conditions of positive mental health history mentioned a history of depression and anxiety, while conditions of negative mental health history did not reference any mental health conditions or symptoms. Depression and anxiety were chosen to represent mental health concerns in the present study, compared to diagnoses such as schizophrenia (which has been used in other studies to represent mental health), given the high prevalence of these conditions among the general U.S. population (National Center for Health Statistics, 2024b) as well as documented comorbidity with physical symptoms, including those that may be considered “unexplained” (Kroenke, 2003; Wessely et al., 1999). The presented case vignettes are described in greater detail below.

Figure 1

2x2 Factorial Design for Vignette Conditions



		Mental Health History	
		Yes	No
Patient Gender	Female	Female patient with mental health history **(condition 1)**	Female patient without mental health history **(condition 2)**
	Male	Male patient with mental health history **(condition 3)**	Male patient without mental health history **(condition 4)**

The use of case vignettes as a methodological tool is a common design element (Tremblay et al., 2022) and serves as a valuable technique to explore perceptions and beliefs, particularly for more sensitive or less accessible areas of investigation (Barter & Renold, 1999). They can be a beneficial tool for studying factors that influence a medical provider’s judgment or decision-making (Evans et al., 2015). The use of vignettes allows for a more targeted examination by isolating the unique impact of specific factors (Matza et al., 2021). The insights gleaned from vignettes can also be generalized to real-life situations, such as a provider’s mental and behavioral processes (Evans et al., 2015). This is particularly beneficial for overcoming potential ethical or practical limitations with other methodological approaches, such as direct observation or self-reporting. When designed and implemented appropriately, vignettes can have both high internal and external validity (Evans et al., 2015). The use of case vignettes for investigating provider judgments and decision-making is also highly consistent with medical training structures and practices (Kathiresan & Patro, 2013). Vignettes are frequently used as a training tool to practice conceptualization and treatment of varying clinical presentations. They are also used as a method to test knowledge and disseminate learning from particular cases to other providers. In the medical community, vignettes are a common tool to summarize and communicate clinical cases concisely and efficiently (Kathiresan & Patro, 2013).

The use of case vignettes in the present study is consistent with prior literature seeking to examine similar research questions about provider biases when confronted with medically unexplained symptoms. A study investigating religious biases and treatment recommendations for MUS utilized vignettes to isolate the impact of religious observance on provider treatment recommendations (Lawrence et al., 2013). Another study presented case vignettes to providers varying the patient’s gender to investigate gender bias in the assessment of MUS symptoms (Claréus & Renström, 2019). Beyond provider biases, case vignettes have also been used to investigate social stigma and attitudes toward individuals with MUS in a sample of college students (Eger Aydogmus, 2020).

There is a consistent acknowledgment of the utility and value of case vignettes in research design across the literature. However, it is imperative to consider guidelines for implementation to ensure validity and reliability when using case vignettes. The construction of vignettes is a fundamental process to ensure appropriate isolation and manipulation of the unique factors being investigated. First and foremost, it is essential to ensure the prepared vignettes are congruent with the purpose of the study (Erfanian et al., 2020). A recent scoping review investigating the use of vignettes as a methodological tool for identifying unique drivers in healthcare delivery variations highlighted several considerations for constructing and implementing robust vignettes (Sheringham et al., 2021). These included considerations of the source information used to construct the vignettes, the number of vignettes presented, variability in representation to enhance generalizability, the format of vignette presentation (e.g., text, video, picture, etc.), how vignettes are evaluated prior to implementation, and the importance of including the vignettes when presenting or publishing findings (Sheringham et al., 2021).

Real-life examples of individuals experiencing MUS informed vignettes in the present study. Neither vignette is based on a single person but rather a composite of individuals who have had similar experiences. The present vignettes were informed by symptom presentations associated with MUS in the literature (Baloh, 2020). For example, abdominal pain is a common component of symptom clusters frequently associated with MUS, such as through the diagnosis of irritable bowel syndrome (IBS). Importantly, the symptoms detailed in the vignettes are consistent with experiences described by patients who report being dismissed or ignored by medical providers and causing significant distress or impairment in daily functioning (Baloh, 2020; Dusenbery, 2018). Additionally, the vignettes depicted patients emerging to young adulthood, specifically the 25-34 age range. While individuals in this age range are not immune to serious health concerns, they are typically at a lower risk for chronic health concerns and disability compared to older adults (Halloran, 2024). They tend to experience higher health risks associated with substance use and pregnancy complications. As such, younger adults tend to be more susceptible to MUS as physical illnesses are more likely to occur in older adults and younger adults are more likely to have comorbid psychological concerns (Jurewicz, 2015).

Vignettes were presented in text format as this is consistent with typical medical practice. While text format may limit generalizability to how physicians practice in real life, it allows for more control of potentially confounding variables, such as other patient characteristics that would be observable through picture or video vignettes. This control allows for targeted investigation of specific variables. Two vignettes, with different symptom presentations, were included in each condition to increase the data's robustness and generalizability.

In order to ensure the construction of realistic and clinically valid vignettes, the vignettes were reviewed by several medical professionals and piloted on a sample of 17 medical students. Having the vignettes reviewed and piloted helped ensure the necessary information was included and that the vignettes accurately reflected the symptoms and experiences congruent with the purpose of the study. Results from the pilot study highlighted the vignettes were clear, easy to follow, and similar and consistent to those commonly used in medical school. There were minimal suggestions for changes or improvements. Some responses from the pilot study indicated that it would be helpful to have additional information on labs or other medical testing. Given these comments, further review by medical professionals was used to explore the utility of providing additional information. Following this review and consultation with literature on diagnostic algorithms used by medical professionals (Charles et al., 2019; Fosnocht & Ende, 2020; Lam et al., 2016), the vignettes were revised to include non-descriptive references to past unremarkable lab results to accurately represent the nature of the patient presentation they aimed to represent. Prior literature has documented that several common laboratory tests are often repeated after a 6–12-month period, with the likelihood of repeating tests increasing over time (Morgen & Naugler, 2015). As such, the previous unremarkable test results described in the vignettes were noted to have occurred six months and one year prior to the current clinical encounter. The vignettes aimed to represent a patient presenting to the provider for the first time, allowing space for ambiguity around previous medical encounters with other providers/clinics and more nuanced decision-making. Limiting the information provided around specific lab/test results allows for greater sensitivity between groups and reduces the chances of a “ceiling effect,” particularly around diagnostic implications. This structure is also consistent with prior studies using vignettes to investigate questions around MUS (Claréus & Renström, 2019; Eger Aydogmus, 2020; Lawrence et al., 2013). The vignette structures are provided in the Materials section below.

2.3 Research Setting/Context

General medicine physicians, including those in primary care, family medicine, and internal medicine settings are the most likely to encounter MUS, whether new or ongoing (Olde Hartman et al., 2017). These physicians often serve as gatekeepers to other more specialized providers and additional assessments. Therefore, these providers have an impact on subsequent treatment approaches or attitudes towards the patients and their symptoms. They also impact patient well-being through their interactions and attitudes toward symptom presentations.

2.4 Participants

Participant recruitment involved a target sample of 130 residents, fellows, and attending-level physicians. The target sample included general practitioners, such as physicians in primary care, family medicine, or internal medicine settings. Participants were recruited through local medical settings, networking connections, and residency programs across the country. They were invited via email to complete a brief online survey through Qualtrics XM. Survey responses were anonymous with personal information (i.e., emails) collected and stored separately from survey responses only for reimbursement purposes. This study was approved as an exempt study by the Institutional Review Board at UNC Charlotte (IRB-23-0715).

2.5 Procedure

Physicians, including residents, fellows, and attending-level physicians, were invited to complete a brief online survey through Qualtrics XM. First, they answered brief screening questions to ensure they were primary care, family medicine, or internal medicine physicians practicing in the U.S. If they were eligible based on their responses to the screening questions, they were presented with informed consent and asked to review and agree before proceeding to the vignettes and questionnaires. Following the provision of informed consent, participants were randomized into one of four conditions, which determined the vignettes they were presented with. Within each condition, providers were exposed to two vignettes varying in the symptom presentation. After each vignette, providers answered questions about diagnostic and treatment considerations. Following the vignettes, providers also answered brief demographic questions as well as a few questions related to typical patient characteristics in their practice and exposure to behavioral health/integrated care training or experience. At the end of the survey, participants were invited to provide contact information (i.e., emails) in a separate Qualtrics survey if they were interested in being entered into a drawing for a chance to win a gift card. This contact information was stored separately from the survey data.

2.6 Materials

Screening Questions

Participants were asked if they were a primary care, family medicine, or internal medicine physician currently practicing in the U.S. to determine their eligibility to participate in the present study. If they responded “yes,” they were directed to the informed consent and subsequent study materials. If they responded “no,” they received a message informing them they were ineligible to participate and thanking them for their time.

Demographics

Demographic information was collected for each participant, including their age, gender identity, race, ethnicity, years of practice, state in which they currently practiced medicine, type of degree (i.e., MD or DO), and status as either a resident, fellow, or attending-level physician. At the end of the survey, to avoid priming, participants were also asked a few questions about additional training/education experiences they have had (e.g., integrated behavioral healthcare, implicit bias, and women's health) and typical demographic characteristics of patients they encounter in their practice.

Case Vignettes

Case vignettes were used to provide a description of a unique and realistic patient presenting with medically unexplained symptoms. Patient gender and history of depression and anxiety were manipulated between conditions. Each participant saw two text-based vignettes varying in the symptoms presented. The two vignette structures were:

(1) A 28-year-old [Male/Female] patient [with a history of depression and anxiety] presents as a new patient to your outpatient primary care clinic with symptoms of abdominal pain and changes to bowel movements, including intermittent constipation and diarrhea. [He/She] denied acute onset and reported worsening symptoms over the past year, including worsening bloating and abdominal cramping. The pain has had a significant impact on [his/her] ability to carry out daily activities and tends to get worse during the workweek. [He/She] reports a lack of symptom relief from OTC medication, such as Tums or Pepto Bismol Initial lab work-up from six months ago was normal per patient report.

(2) A 33-year-old [Male/Female] patient [with a history of depression and anxiety] presents for the first time to your outpatient primary care clinic with symptoms of fatigue, generalized muscle pain and weakness, and headaches. [He/She] reports that the symptoms started about two years ago and have increased in severity and impairment since then. [He/She] denies any known precipitating factors prior to the start of the symptoms, including illness, injury, and psychosocial stressors. Since the onset of symptoms [he/she] has reported a significant loss of functioning and impaired ability to carry out ADLs. [He/She] was let go from work after the first few months required [him/her] to take significant sick leave and has been unable to work since. The patient indicated having labs run over a year ago with a prior doctor, denying remarkable findings.

Provider Decision-Making

Following each vignette, participants were presented with a series of questions about assessing and treating the presented symptoms. These questions included a multiple-choice question about which diagnosis they were considering based on the available information. Multiple choice options for both vignettes included diagnoses on a continuum of those with known biological etiologies to those that are considered more “functional” or may be attributed to psychosomatic origins. These options helped to represent the range and nuances associated with MUS, including options that may fall in the middle of the continuum, such as irritable bowel syndrome and fibromyalgia. Diagnoses considered within the classification of “medically unexplained” are consistent with prior research (Claréus & Renström, 2019).

Following the multiple choice question regarding diagnosis, participants were asked a series of questions about the likelihood that: 1) the patient described having an explainable medical illness that can be easily treated; 2) the patient’s somatic complaints were related to behavioral health concerns; 3) the provider ordering additional tests or referring the patient to a specialty provider; and 4) the provider referring the patient to behavioral health services. Participants were asked to rate the likelihood of each option on a scale of 0-100.

CHAPTER 3: DATA ANALYSIS

3.1 Power Analysis

For the primary analyses, a power calculation was performed using G*Power 3.1 (Faul et al., 2007) for ANOVA. Parameters were 1-Beta = 0.8, alpha error probability = 0.05, and effect size $f = 0.3$. This yielded a minimum sample of 128 needed to detect a moderate to large effect size.

3.2 Descriptive Statistics

Descriptive statistics (e.g., frequencies and percentages for categorical variables and means and standard deviations for continuous variables) were run as a first step to ensure the data was normally distributed and had adequate statistical variance for the analyses. Descriptive statistics were also used to report the demographic variables of providers and their practice characteristics.

3.3 Analytical Plan Across Vignettes

Mean likelihood scores were calculated for both individual vignette responses and averaged across the two vignettes for a combined score within each condition. Subsequent analyses were run on both the individual and combined vignette scores. Additionally, zero-order correlations were used to examine associations between variables, including responses per each vignette to review potential variations based on symptom presentations.

3.4 Analysis of Specific Research Questions

To examine the first hypothesis (Hypothesis 1a), categorical diagnoses were re-coded as dichotomous with the options indicating either a medically “explained” or “unexplained” condition, consistent with prior research (Claréus & Renström, 2019). For the first vignette, responses of irritable bowel syndrome and somatization were coded as MUS, while responses of

Crohn’s disease, ulcerative colitis, and GERD were coded as “medically explained.” For the second vignette, responses of chronic fatigue syndrome, somatization, and fibromyalgia were coded as MUS, while lupus and multiple sclerosis were coded as “medically explained.” The values for both vignettes were then averaged to create a comprehensive score of 0, 0.5, or 1 for each participant. This study aimed to use a chi-square test to determine whether there are statistically significant differences in categorical diagnoses between conditions. However, this analysis was not conducted due to the data distribution, which is discussed in further detail in Chapters 4 and 5.

A series of four ANOVAs were conducted to examine the remaining hypotheses under RQ1 and the hypotheses associated with RQ2. The first ANOVA model compared the likelihood of medical diagnosis across conditions (Hypothesis 1b). The second ANOVA model compared the likelihood of a behavioral health diagnosis across conditions (Hypothesis 1c). To help address the second research question, a third and fourth ANOVA model assessed the likelihood of medical treatment (Hypothesis 2a) and behavioral health treatment (Hypothesis 2b) across conditions. For significant models ($p < 0.05$), between-group differences were analyzed using Dunn-Bonferonni post hoc comparisons.

3.5 Secondary Analyses

Following preliminary analyses, including descriptive statistics and correlations, and primary analyses comparing means across groups, several observed trends indicated additional analyses. For example, correlational data and differences within groups between medical and behavioral health diagnosis and treatment options suggested the primary analyses were not capturing the full relationship between the key study variables in relation to the specific research questions and hypotheses (see Tables 2 and 3 and Figures 3-6 in the results and Appendix A for depictions of data trends). Given these observed trends, additional analyses were conducted to investigate differences in the likelihood of a medical versus behavioral health explanation for the patient’s causes. Specifically, secondary analyses were implemented to compare the likelihood that a patient’s symptoms were rated as due to a medical condition to the likelihood that a patient’s symptoms were rated as due to a behavioral health concern using paired sample t-tests to compare within-subjects responses for each condition. An additional power analysis was conducted using G*Power (Faul et al., 2007) for paired samples *t*-tests to ensure adequate power with the present sample size. Parameters were 1-Beta = 0.8, alpha error probability = 0.05, and effect size = 0.5. This yielded a minimum sample of 34 in each group needed to detect a moderate to large effect size. Each condition sample size met this requirement with sample sizes of 36-39. These analyses were conducted for each of the four conditions. Additional paired sample t-tests were conducted to compare mean differences for each of the four conditions between the likelihood of medical treatment and the likelihood of behavioral health treatment.

CHAPTER 4: RESULTS

4.1 Participant Characteristics

A total of 181 individuals participated in the study. Out of those, 29 participants were excluded from data analysis due to incomplete or missing data. Participants were only included if they had complete data for at least one vignette. This left a sample of 152 participants who were included in the analyses, with full demographic data for 134 responses. Demographic questions were optional for participants.

The sample consisted of primary care physicians, including family medicine and internal medicine providers[1]. The average age of participants was 32.35 years (*SD* = 7.89). One-hundred thirteen (113, 84.3%) identified as residents with an average of 1.98 years of practice outside of medical school, while the remaining 21 (15.7%) identified as attending-level physicians with an average of 16.42 years of practice outside of medical school. The majority of the sample identified as cisgender women (57%), White or European American (63%), and as having an MD (69%). The sample included physicians practicing across 28 different states (see Appendix B for state breakdown) including representation of all five regions in the U.S. Participant characteristics are reported in Table 1.

4.2 Practice Characteristics

Providers estimated percentages of patient demographics they see within their practice, including age, race and ethnicity, gender, and co-morbid mental health concerns. On average, providers estimated the highest percentage of patients were aged 50-59 (31%) or 60-69 (33.6%). On average, providers indicated that half of the patients in their practice are white, with the remaining majority representation including Black/African American (28%), Hispanic/Latinx

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[1] The specific breakdown of how many respondents were providers from family medicine versus internal medicine is unavailable.

Table 1

Participant Characteristics

	M	*SD*
Age, years (*n* = 133)	32.35	7.89
Years of practice (*n* = 133)	4.26	6.91
	n	%
Gender (*n* = 134)		
Cisgender Woman	77	57%
Cisgender Man	51	38%
Transgender Woman	1	1%
Gender Queer/Fluid	2	2%
Race and Ethnicity (*n* = 134)		
White or European America	85	63%
South Asian or South Asian American	29	22%
Black, African American, or Afro Caribbean	9	7%
Middle Eastern, Arab American, or North African	9	7%
East Asian or East Asian American	7	5%
Native American/Alaska Native/First Nations	2	1%
Hispanic, Latino/a, or Spanish Origin	2	1%
Native Hawaiian or Pacific Islander	1	1%
Multiracial	1	1%
Degree (*n* = 134)		
Doctor of Medicine (MD)	93	69%
Doctor of Osteopathy (DO)	41	31%
Stage of Practice (*n* = 134)		
Residency	113	84.3%
Attending level	21	15.7%
Additional Training Experiences (*n* = 134)		
Treatment of mental health concerns	66	49%
Implicit Bias	59	44%
Women's health	45	34%
Integrated Behavioral Health/Primary Care	40	30%
Mental/Behavioral Health Counseling	24	18%
Psychiatry	17	13%
Functional Medicine	16	12%
Long COVID/Post COVID	11	8%
U.S. Region of Current Practice (*n* = 134)		
Northeast	21	15.7%
Southeast	23	17.2%
Midwest	53	39.6%
Southwest	13	9.7%
West	11	8.2%

(20%), and multiracial/biracial (16%). Racial and ethnic categories of East Asian, Native Hawaiian/Pacific Islander, Native American, Middle Eastern or North African, and South Asian each comprised 10% or less of the average patient demographics. Average estimates of gender demographics included nearly half of patients identifying as cisgender women with the other half comprising cisgender men. Transgender women, transgender men, and gender queer/fluid/nonconforming comprised smaller estimates, all under 8%. Finally, providers on average estimated that more than half (54.3%) of the patients seen in their practice have co-morbid mental health concerns. See Appendix C for graphs of averaged practice demographics.

4.3 Preliminary Analyses

Average responses for diagnostic and treatment likelihoods per condition are outlined in Table 2 (diagnosis likelihood) and Table 3 (treatment likelihood). Zero-order correlations of study variables are reported in Appendix A. All means were normally distributed with appropriate variability based on the standard deviations. Histograms of primary study variables can be found in Appendix D. Categorical diagnoses were skewed with a majority of the diagnoses selected falling under the category of MUS and only 5% of responses indicating a "explainable" medical condition for the first vignette and 10.5% for the second vignette. Kurtosis was greater than |2| for the individual and combined vignette responses. Given the categorical diagnosis variable was highly skewed, it was excluded from subsequent analyses as a chi-squared test cannot be conducted with highly skewed distributions and very small cells (e.g., five cells had a count of less than five).

Pearson product-moment correlation analysis revealed significant correlations between combined vignette averages for medical diagnosis and medical treatment (0.21, $p = .010$) and behavioral health diagnosis and behavioral health treatment (0.42, $p < .001$). In addition, combined behavioral health diagnosis was negatively correlated with combined medical treatment (-0.19, *p* = .020). Responses for both vignettes were also appropriately correlated. For example, medical diagnosis averages for vignette 1 were significantly correlated with those for vignette 2 (0.56, *p* < .001). This pattern of significant correlation is consistent across diagnosis likelihood and treatment likelihood responses, such that medical diagnosis and treatment likelihood responses are correlated with each other, while behavioral health diagnosis and treatment questions are correlated with each other. The only combination that deviates from that trend is medical diagnosis likelihood and medical treatment likelihood for vignette 1, which are not significantly correlated with each other. Notably, medical likelihood and behavioral health likelihood are not significantly correlated for either diagnosis or treatment. Vignette condition is only correlated with combined medical treatment likelihood (0.18, *p* = .026).

Vignette 1 (Abdominal Pain)

The first vignette described a patient with symptoms of abdominal pain and changes in bowel movements. In condition 1 (female patient with a history of depression and anxiety), 38 (97%) providers identified irritable bowel syndrome (IBS) as the most likely diagnosis, while one respondent indicated Crohn’s disease or ulcerative colitis. Providers within condition 1 indicated a mean likelihood of 57.72% (*SD* = 23.37) that the patient described has an explainable medical illness that can be easily treated and a mean likelihood of 64.13% (*SD* = 18.67) that the patient’s somatic complaints are related to behavioral health concerns. Additionally, providers indicated a mean likelihood of 56.26% (*SD* = 27.49) that they would order additional tests or refer to specialty medical providers (medical treatment) and a mean likelihood of 56.33% (*SD* = 28.18) that they would refer the patient to behavioral health services (behavioral health treatment).

In condition 2 (female patient without a history of mental health concerns), 33 (92%) of providers indicated IBS as the most likely diagnosis, while one provider indicated somatization and two providers indicated Crohn’s disease / ulcerative colitis. Providers in this condition indicated a mean likelihood of 63.83% (*SD* = 17.71) that the patient described in the vignette has an explainable medical illness and a mean likelihood of 58.94% (*SD* = 22.29) that the patient’s symptoms can be attributed to behavioral health concerns. For treatment options, providers indicated a mean likelihood of 68.03% (*SD* = 29.32) that they would pursue medical follow-up and a mean likelihood of 55.89% (*SD* = 28.11) for recommending behavioral health intervention.

For condition 3 (male patient with a history of depression and anxiety), 34 participants (87%) indicated IBS as the most likely diagnosis, while four participants indicated somatization and one participant indicated Crohn’s disease / ulcerative colitis. Providers indicated a mean likelihood of 56.64% (*SD* = 23.51) that the patient described has an explainable medical condition and a mean likelihood of 56.26% (*SD* = 23.97) that the symptoms are attributed to behavioral health concerns. Additionally, providers indicated a mean likelihood of 52.41% (*SD* = 30.77) for medical follow-up and a mean likelihood of 52.10% (*SD* = 29.45) for behavioral health follow-up.

In condition 4 (male patient without a history of mental health concerns), 32 (84%) providers indicated IBS as the most likely diagnosis, while one provider indicated somatization and five providers indicated Crohn’s disease or ulcerative colitis. Providers indicated a mean likelihood of 61.16% (*SD* = 18.88) for a medically explainable diagnosis and a mean likelihood of 54.97% (*SD* = 24.03) for the symptoms being attributed to behavioral health concerns. In response to treatment options, providers indicated a mean likelihood of 73.89% (*SD* = 23.76) for medical follow-up and a mean likelihood of 47.45% (*SD* = 26.72) for behavioral health follow-up.

Vignette 2 (Generalized Pain and Fatigue)

The second vignette describes a patient with symptoms of generalized pain, headaches, and fatigue. In condition 1 (female patient with a history of depression and anxiety), 17 (50%) of providers indicated fibromyalgia as the most likely diagnosis, while nine providers (26%) indicated chronic fatigue syndrome (CFS), four providers (12%) indicated somatization, two providers (6%) indicated lupus, and two providers (6%) indicated multiple sclerosis (MS). Providers indicated a mean likelihood of 44.65% (*SD* = 21.13) that the patient described has an explainable medical condition and a mean likelihood of 61.53% (*SD* = 19.57) that the patient's complaints are attributable to mental health concerns. Additionally, providers indicated a mean likelihood of 61% (*SD* = 31.00) for medical follow-up and a mean likelihood of 64.44% *(SD* = 23.72) for behavioral health treatment.

In condition 2 (female patient without a history of mental health concerns), 18 (53%) providers indicated fibromyalgia as the most likely diagnosis, while eight providers (24%) indicated CFS, five providers (15%) indicated MS, two providers (6%) indicated somatization, and one provider (3%) indicated lupus. Providers indicated a mean likelihood of 53.91% (*SD* = 18.35) for a medically explainable diagnosis and a mean likelihood of 52.47% (*SD* = 16.95) that the symptoms could be attributed to mental health concerns. For treatment options, providers indicated a mean likelihood of 77.03% (*SD* = 23.39) for medical follow-up and a mean likelihood of 58.06% (*SD* = 24.83) for behavioral health follow-up.

Within condition 3 (male patient with a history of depression and anxiety), 13 (35%) providers indicated fibromyalgia as the most likely diagnosis, while 11 (30%) indicated CFS, nine (24%) indicated somatization, three (8%) indicated MS, and one (3%) indicated lupus. On average, providers indicated a likelihood of 43.78% (*SD* = 19.81) that the patient described has an explainable medical illness and a likelihood of 52.24% (*SD* = 22.89) that the symptoms could be attributed to behavioral health concerns. In addition, providers indicated a mean likelihood of 69.76 (*SD* = 30.57) for medical follow-up and a mean likelihood of 58.11 (*SD* = 29.78) for behavioral health follow-up.

In condition 4 (male patient without a history of mental health concerns), 19 (56%) providers indicated fibromyalgia as the most likely diagnosis, while nine (26%) indicated CFS, three (9%) indicated MS, two (6%) indicated lupus, and one (3%) indicated somatization. Providers indicated a mean likelihood of 46.09% (*SD* = 22.11) that the patient described as an explainable medical illness and a mean likelihood of 55.59% (*SD* = 20.76) that the patient's symptoms could be attributed to behavioral health concerns. For treatment options, providers indicated a mean likelihood of 76.91% (*SD* = 19.29) for medical follow-up and 62.82% (*SD* = 24.65) for behavioral health follow-up.

Combined Vignettes

Responses were also combined for an average response across both vignettes. A majority of providers (n = 147; 97%) indicated at least one vignette describing a patient with a condition under the umbrella of MUS. Twenty-one of those had divided responses across vignettes, indicating a MUS-related diagnosis for one vignette and a medically "explainable" diagnosis for the other vignette. Only five providers across all four conditions indicated a medically "explainable" diagnosis for both vignettes.

Combining responses for both vignettes resulted in a mean likelihood of 52.50% (*SD* = 20.51) for medical diagnosis and a mean likelihood of 63.65% (*SD* = 17.37) for behavioral health attribution, within condition 1. In addition, providers in condition 1 had a combined mean likelihood of 58.54% (*SD* = 23.97) for medical follow-up and a combined mean likelihood of 58.60% (*SD* = 25.09) for behavioral health follow-up. Providers in condition 2 had a combined mean likelihood of 59.42% (*SD* = 15.59) for medical diagnosis and a combined mean likelihood of 55.69% (*SD* = 18.08) for attributing the symptoms to behavioral health concerns. Combined treatment responses for condition 2 resulted in a mean likelihood of 71.33% (*SD* = 23.52) for medical follow-up and a mean likelihood of 57.83% (*SD* = 24.53) for behavioral health follow-up. Within condition 3, providers had a combined mean likelihood of 50.50% (*SD* = 20.07) for medical diagnosis and a combined mean likelihood of 54.19% (*SD* = 20.57) of attributing the symptoms to behavioral health. Providers in condition 3 also had a combined mean likelihood of 61.09% (*SD* = 26.26) for medical follow-up and a combined mean likelihood of 55.15% (*SD* = 26.54) for behavioral health follow-up. Providers in condition 4 had a combined mean likelihood of 54.24% (*SD* = 18.24) for medical diagnosis and a combined mean likelihood of 55.55% (*SD* = 20.06) for attributing symptoms to behavioral health. For treatment options, providers in condition 4 had combined mean likelihoods of 74.66% (*SD* = 18.33) for medical follow-up and 53.84% (*SD* = 22.62) for behavioral health follow-up. Mean Plots for each diagnosis and treatment likelihood question can be found in Appendix E.

4.4 Substantive Analyses

A series of one-way ANOVAs were conducted to compare the effect of patient characteristics (gender and mental health history) on diagnosis and treatment likelihoods. Comparisons were made between four conditions of patient characteristics, including female patients with a history of depression and anxiety (condition 1), female patients without a history of mental health concerns (condition 2), male patients with a history of depression and anxiety (condition 3), and male patients without a history of mental health concerns (condition 4).

Diagnostic Likelihood (RQ1)

Two hypotheses were tested to examine how knowledge of patient gender and mental health history impact the likelihood of diagnostic options (RQ1). It was hypothesized that providers would indicate a smaller likelihood of a medical diagnosis for female patients with a history of mental health concerns (Hypothesis 1b). There were no significant differences between conditions of patient characteristics and likelihood of medical diagnosis; $F(3,148) = 1.54$, $p = .207$. The effect size was small, with an eta squared of 0.03 (95% CI: 0.00 - 0.09). It was also hypothesized that providers would indicate a greater likelihood of behavioral health diagnosis for female patients with a history of mental health concerns (Hypothesis 1c). Similarly, there were no significant differences in behavioral health diagnosis likelihood between conditions; $F(3, 148) = 1.98$, $p = .120$. The effect size was small, with an eta squared of 0.04 (95% CI: 0.00 - 0.10). Full results for diagnosis likelihood are reported in Table 2.

Treatment Likelihood (RQ2)

To investigate how knowledge of patient gender and mental health history impact provider decisions about treatment (RQ2), two additional hypotheses were tested with ANOVAs. First, it was hypothesized that providers would indicate a smaller likelihood of medical testing and follow-up for female patients with a known history of mental health concerns (Hypothesis 2a). Results revealed a significant difference between conditions on the mean likelihood of medical treatment at the $p < .01$ level for the four groups; $F(3, 148) = 4.31$, $p = .006$ (Figure 1). The effect size was medium, with an eta squared of 0.08 (95% CI: 0.01 - 0.16). Dunn-Bonferroni post hoc comparisons indicated a significant difference between condition 1 (female

Table 2

Means, Standard Deviations, and ANOVA Statistics for Diagnosis Likelihoods Across Conditions

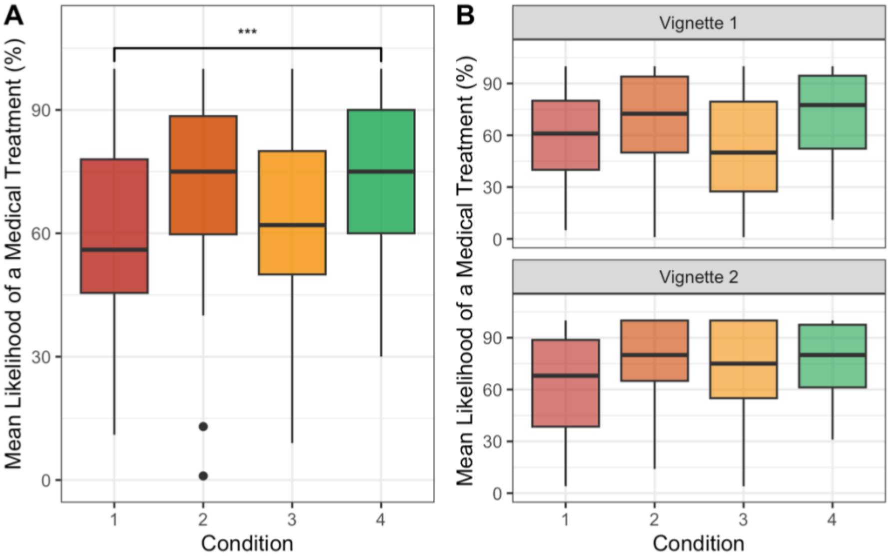
Diagnostic Etiology	Condition 1		Condition 2		Condition 3		Condition 4		ANOVA	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F (3)*	*p*
Vignette 1 (abdominal pain)										
Medical	57.72	23.37	63.83	17.71	56.64	23.51	61.16	18.88	.91	.439
Behavioral Health	64.13	18.67	58.94	22.29	56.26	23.97	54.97	24.03	1.28	.285
Vignette 2 (generalized pain and fatigue)										
Medical	44.65	21.13	53.91	18.35	43.78	19.81	46.09	22.11	1.78	.153
Behavioral Health	61.53	19.57	52.47	16.95	52.24	22.89	55.59	20.76	1.58	.197
Combined Vignettes										
Medical	52.50	20.51	59.42	15.59	50.50	20.07	54.24	18.24	1.54	.207
Behavioral Health	63.65	17.37	55.69	18.08	54.19	20.57	55.55	20.06	1.98	.120

Note. n = 152. ANOVA = analysis of variance.

patients with a history of depression and anxiety) and condition 4 (male patients with no mental health history). The mean difference between condition 1 and condition 4 was 16.12 (SE = 5.29; $p = .017$), such that providers were less likely to consider medical treatment for female patients with a history of depression and anxiety, providing support for the hypothesized relationship (Figure 2). Additionally, it was hypothesized that providers would indicate a greater likelihood for behavioral health referral or treatment for female patients with a history of mental health concerns (Hypothesis 2b). There was no significant difference in the mean likelihood of behavioral health treatment across conditions; $F(3, 148) = 0.31$, $p = .817$. The effect size was negligible, with an eta squared of <0.01 (95% CI: 0.00 - 0.03). Results were consistent when analyzing individual vignette responses and combined responses for all four hypotheses. Full results for treatment likelihood are reported in Table 3.

Figure 2

Mean Likelihood of Medical Treatment Across Conditions for Individual and Combined Vignettes



Note. Vignette 1 describes a patient with symptoms of abdominal pain. Vignette 2 describes a patient with symptoms of generalized pain and fatigue. *** $p < .001$

Table 3

Means, Standard Deviations, and ANOVA Statistics for Treatment Likelihoods Across Conditions

Treatment Domain	Condition 1		Condition 2		Condition 3		Condition 4		ANOVA	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F (3)*	*p*
Vignette 1 (abdominal pain)										
Medical	56.26	27.49	68.03	29.32	52.41	30.77	73.89	23.76	4.92^{**}	.003
Behavioral Health	56.33	28.18	55.89	28.11	52.10	29.45	47.45	26.72	0.82	.487
Vignette 2 (generalized pain and fatigue)										
Medical	61.00	31.00	77.03	23.39	69.76	30.57	76.91	19.29	2.76^{*}	.044
Behavioral Health	64.44	23.72	58.06	24.83	58.11	29.78	62.82	24.65	0.55	.648
Combined Vignettes										
Medical	58.54	23.97	71.33	23.52	61.09	26.26	74.66	18.33	4.31^{**}	.006
Behavioral Health	58.60	25.09	57.83	24.53	55.15	26.54	53.35	22.62	0.31	.817

Note. N = 152. ANOVA = analysis of variance.

$^{*}p < .05$. $^{**}p < .01$

4.5 Secondary Analyses

Additional analyses were conducted to compare mean differences between diagnosis and treatment likelihoods, for both medical and behavioral health, within each condition. For the combined vignettes, there was a significant difference among condition 1 (female patients with a history of depression and anxiety) in the scores for medical diagnosis likelihood (*M* = 52.50, *SD* = 20.51) and behavioral health diagnosis likelihood (*M* = 63.65, *SD* = 17.37); *t*(38) = -2.26, *p* = .029. Providers indicated a greater likelihood that the patient's symptoms were related to behavioral health as compared to explainable medical causes for a female patient with a history of mental health concerns. The effect size was small, with a Cohen's d of 0.36 (95% CI: -0.68 - -0.04). In addition, there was a significant difference among condition 4 (male patient with no mental health history) in the scores for medical treatment likelihood (*M* = 74.66, *SD* = 18.33) and behavioral health treatment (*M* = 53.35, *SD* = 22.62); *t*(37) = 4.90, *p* < .001). Providers presented with a male patient with no history of mental health concerns indicated a significantly higher likelihood of considering medical follow-up and treatment compared to behavioral health treatment. The effect size was moderate, with a Cohen's d of 0.79 (95% CI: 0.43 - 1.16).

Analyzing each vignette separately indicated some variations in significant differences within conditions. For the first vignette, describing a patient with symptoms of abdominal pain, there was a significant difference among condition 4 in the scores for medical treatment likelihood (*M* = 73.89, *SD* = 23.76) and behavioral health treatment likelihood (*M* = 47.45, *SD* = 26.72); *t*(37) = 4.72; *p* < .001. The effect size was moderate, with a Cohen's d of 0.77 (95% CI: 0.40 - 1.12). Providers presented with a male patient with no history of mental health concerns and experiencing symptoms of abdominal pain indicating a higher likelihood of considering medical follow-up/treatment compared to behavioral health treatment.

For the second vignette, describing a patient with generalized pain, headaches, and fatigue, there were significant differences in several conditions for both diagnosis and treatment likelihood. Two conditions had significant differences in diagnosis likelihood scores. First, there was a significant difference among condition 1 in the scores of medical diagnosis likelihood (*M* = 44.65, *SD* = 21.13) and behavioral health diagnosis likelihood (*M* = 61.53, *SD* = 19.57); *t*(33) = -2.87, *p* = .007. The effect size was small, with a Cohen's d of 0.49 (95% CI: -0.85 - -0.13). In addition, there was a significant difference among condition 4 in the scores of medical diagnosis likelihood (*M* = 46.09, *SD* = 22.11) and behavioral health diagnosis likelihood (*M* = 55.59, *SD* = 20.76); *t*(33) = -2.05, p = .049. The effect size was small, with a Cohen's d of 0.35 (95% CI: -0.70 - -0.002). For both of these conditions (female patient with a history of mental health concerns and male patient with no history of mental health concerns), providers indicated a higher likelihood of attributing the symptoms to behavioral health compared to explainable medical etiology. Additionally, two conditions had significant differences in treatment likelihood. There was a significant difference among condition 2 (female patients with no mental health history) in the scores for medical treatment likelihood (*M* = 77.03, *SD* = 23.39) and behavioral health treatment likelihood (*M* = 58.06, *SD* = 24.83); *t*(33) = 2.98, *p* = .005. The effect size was moderate, with a Cohen's d of 0.51 (95% CI: 0.15 - 0.87). Additionally, there was a significant difference among condition 4 in the scores for medical treatment likelihood (*M* = 76.91, *SD* = 19.29) and behavioral health treatment likelihood (*M* = 62.82, *SD* = 24.85); *t*(33) = 2.83, *p* = .008. The effect size was small, with a Cohen's d of 0.49 (95% CI: 0.13 - 0.84). For both conditions (male patients with and without a history of mental health concerns), providers indicated a higher likelihood of considering medical follow-up/treatment compared to behavioral health treatment. Full results from post hoc paired samples t-tests are reported in Table 4 and depicted in Figures 3 and 4.

Table 4

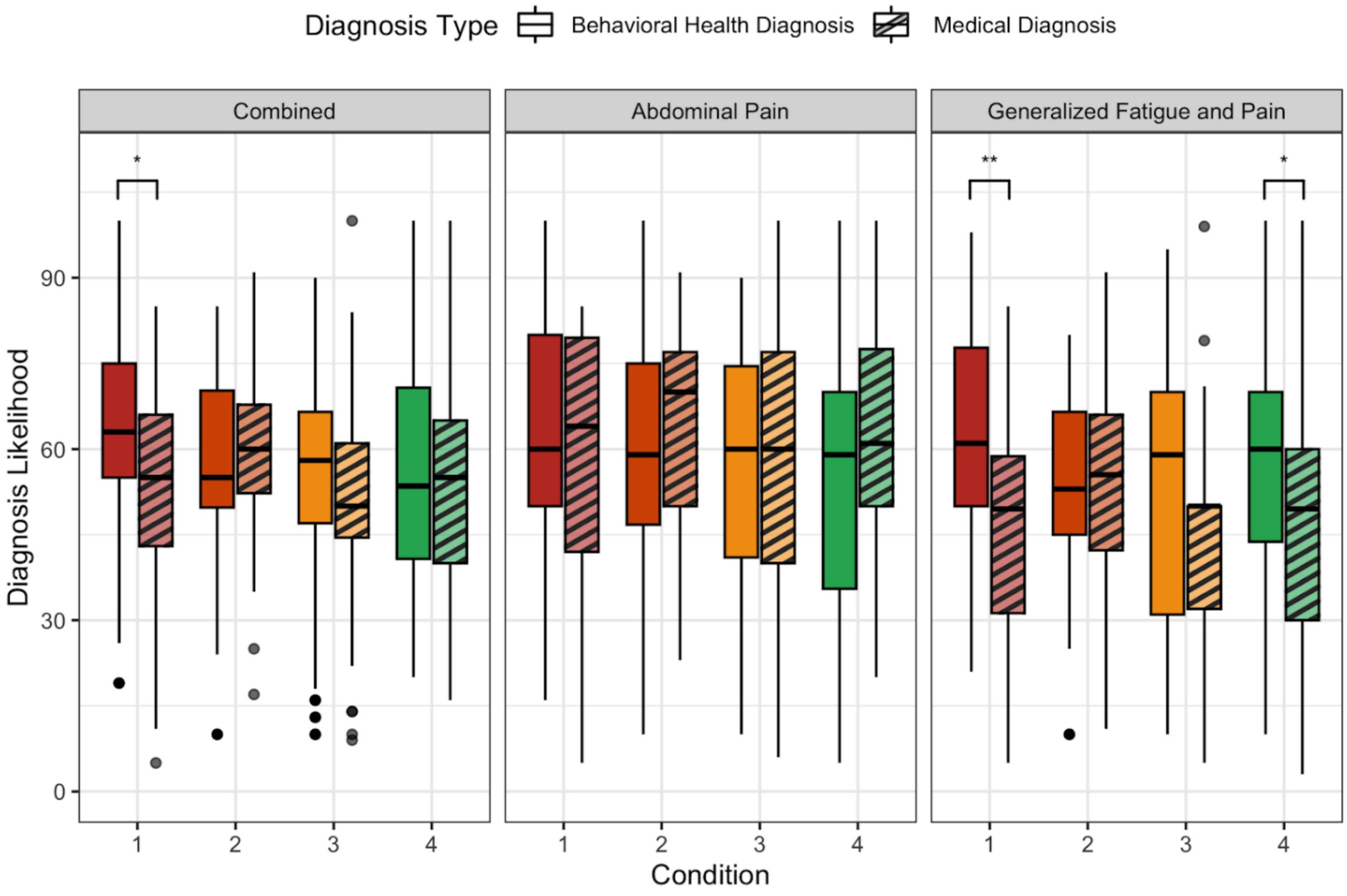
Within-Subjects Paired Samples T-Test Comparison Between Medical and Psychological Domains for Diagnosis and Treatment Likelihoods

Condition	Diagnosis			Treatment		
	t	*p*	Cohen's *d*	*t*	*p*	Cohen's *d*
Vignette 1 (abdominal pain)						
Condition 1	-1.18	.245	0.19	-0.01	.991	0.00
Condition 2	1.12	.271	0.19	1.54	.131	0.26
Condition 3	0.07	.946	0.01	0.05	.962	0.00
Condition 4	1.28	.209	0.21	4.72***	<.001	0.77
Vignette 2 (generalized pain and fatigue)						
Condition 1	-2.87**	.007	0.49	-0.51	.610	0.09
Condition 2	0.31	.758	0.05	2.98**	.005	0.51
Condition 3	-1.76	.086	0.29	1.66	.105	0.27
Condition 4	-2.05*	.049	0.35	2.83**	.008	0.49
Combined Vignettes						
Condition 1	-2.26*	.029	0.36	-0.01	.991	0.00
Condition 2	0.97	.337	0.16	2.01	.052	0.34
Condition 3	-0.82	.418	0.13	1.38	.311	0.17
Condition 4	-0.37	.715	0.06	4.90***	<.001	0.79

$^{*}p < .05$. $^{**}p < .01$. $^{***}p <.001$

Figure 3

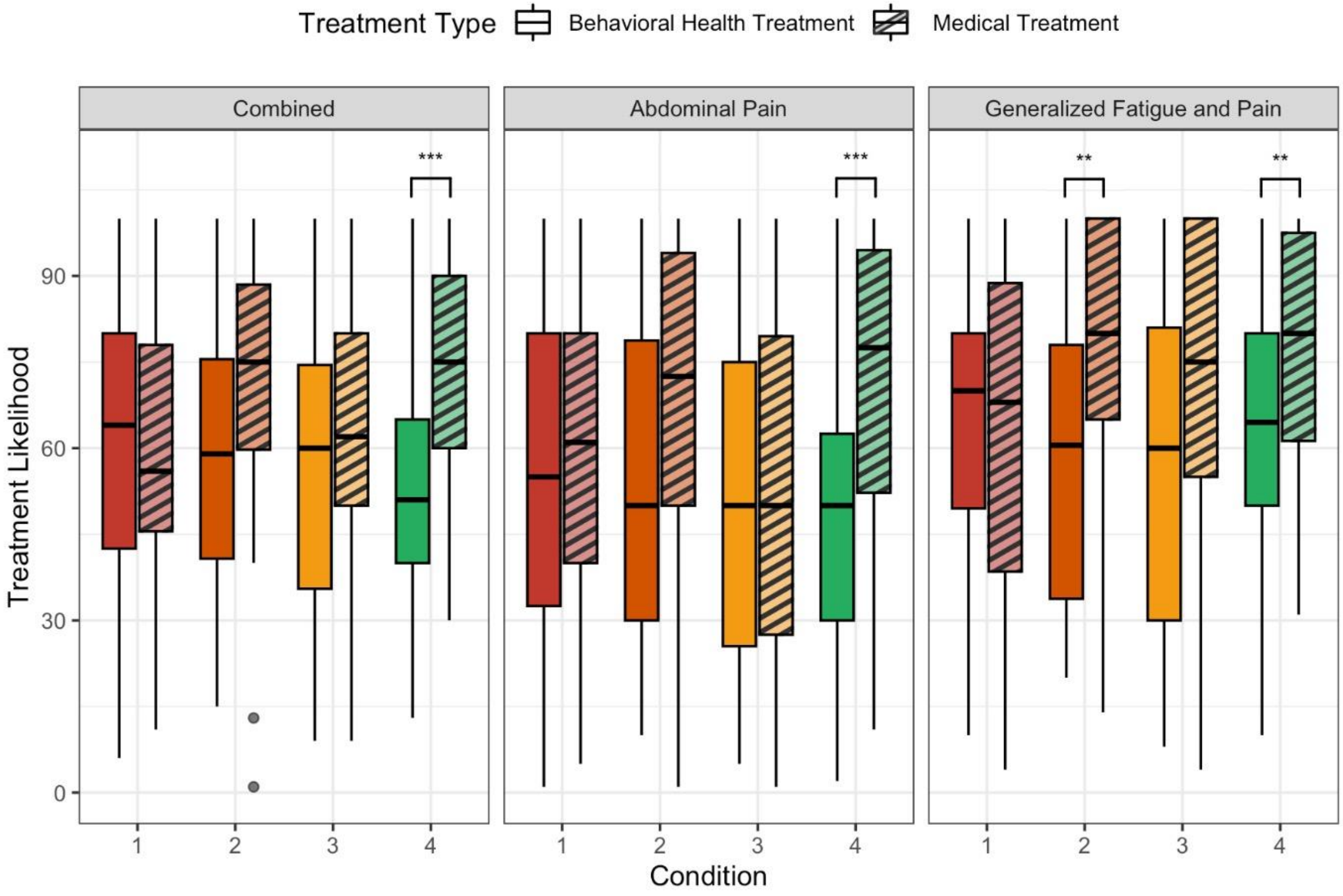
Medical and Behavioral Health Diagnostic Likelihood Comparisons Across Conditions



$^{*}p < .05.$ $^{**}p < .01.$

Figure 4

Medical and Behavioral Health Treatment Likelihood Comparisons Across Conditions



$^{**}p < .01.$ $^{***}p < .001.$

CHAPTER 5: DISCUSSION

5.1 Introduction

Medically “unexplained” symptoms (MUS) represent a highly prevalent phenomenon of persistent physical symptoms with unclear etiology, which are then often attributed to behavioral health factors. MUS are a challenge for patients experiencing them and providers attempting to understand and treat them. This study aimed to examine the extent to which biases due to patient characteristics impact medical providers’ decision-making in the context of MUS. Specifically, how does knowledge of a patient’s gender and mental health history impact a provider’s decision-making regarding diagnosis (Research Question 1) and treatment or follow-up (Research Question 2)? It was hypothesized that, for female patients with a history of mental health concerns compared to other patient characteristics (i.e., male patients and patients without a history of mental health concerns), providers would indicate a smaller likelihood of medical etiology and treatment and a greater likelihood of attributing symptoms to behavioral health and considering behavioral health treatment. To investigate the study hypotheses, 152 primary care physicians across the United States were randomly assigned to one of four conditions, varying in patient characteristics, and given two vignettes describing patients presenting to their practice with syndromes commonly associated with MUS. Following each vignette, providers were asked a series of questions assessing diagnostic and treatment decisions for the described patient.

The present study adds significant value to the existing literature on this topic by investigating the combined influence of both patient gender and mental health history, given prominent historical intersections (Tasca et al., 2012). In addition, the present study’s operationalization of mental health as depression and anxiety expands on previous studies to enhance understanding of how more prevalent mental health concerns, which are also often comorbid with physical symptoms, may impact clinical decision-making in the context of MUS (Corrigan et al., 2014; Yamauchi et al., 2019). Finally, the present sample includes representation of physicians across 28 states and all major U.S. regions, increasing generalizability of findings nationally. This chapter will summarize and interpret the key findings related to the present study's research objectives and prior literature. In addition, limitations, implications for practice, and future directions will be discussed.

5.2 Overview of Key Findings

The results from the present study included a mixture of expected and unexpected findings. Contrary to expectations, patient gender and mental health history did not have a significant impact on diagnosis likelihood for either medical or behavioral health diagnosis considerations (RQ1). Regardless of patient characteristics, providers were more inclined to consider a diagnosis typically associated with MUS and commonly attributed to psychological, rather than biological, origins, when asked to choose from a list of diagnosis options. Also contrary to expectations, the likelihood of considering behavioral health treatment was not significantly impacted by varying patient characteristics (RQ2 H2b). Consistent with prior literature and known biases among healthcare providers, patient gender and mental health history impacted the consideration of medical treatment, including additional testing and follow-up (RQ2 H2a). Specifically, providers were more likely to consider medical treatment options for male patients with no mental health history compared to female patients with a history of depression and anxiety.

When looking at responses across the sample of providers, there were minimal variations in responses based on patient characteristics, except for considerations of medical treatment options. However, data trends indicated potential significant relationships between key variables, which were not being captured by the between-group comparisons, warranting further investigation. Additional analyses identified significant differences between responses within different conditions. The data showed that there were significant differences in the extent to which providers attributed symptoms to medical versus behavioral health causes for female patients with a history of depression and anxiety. Providers were also significantly more likely to consider medical treatment compared to behavioral health treatment for male patients without a history of mental health concerns.

Overall, the key findings from this study illustrate continued trends of patient characteristics impacting provider decision-making regarding medical treatment when confronted with symptoms or syndromes that don’t fit traditional disease models. Additional analyses also highlighted differences between medical and psychological assessments for some but not all patients, depending on gender and mental health histories. In addition, nuances in the present data, including insignificant findings that are inconsistent with expectations and prior literature, highlight the need for continued research and exploration of this complex phenomenon.

5.3 Interpretation of Findings

Diagnostic Assessment in the Context of MUS (RQ1)

Diagnosis Choice. The first hypothesis (hypothesis 1a) within RQ1 aiming to investigate categorical diagnosis of MUS, was unable to be investigated in the present dataset due to a highly asymmetrical distribution. Nearly all providers indicated a diagnosis within the classification of MUS regardless of patient characteristics. Although the originally planned analysis could not be conducted, the available data still warrants discussion.

There are several potential explanations for this asymmetrical data distribution. First, it is possible that the multiple-choice format, while consistent with medical training and prompting ease of provider responses, allowed for priming. An open response format may have elicited a different trend if providers were prompted to indicate a diagnosis without being given choices. In addition, there are some variations in which diagnoses are considered MUS and even growing recognition for limitations and inaccuracies categorizing syndromes as MUS (Reme, 2024; Van den Bergh et al., 2017). It is possible that capturing a dichotomized perspective of MUS-related diagnoses is not realistic or feasible, which also illustrates the general limitations of binary diagnostic classifications due to their reductive nature. Another possible explanation is that the symptoms described were too obviously classified as MUS-related diagnoses, thus creating a "ceiling effect." Providers typically use diagnostic algorithms based on history taking, physical examination, and medical investigation, to guide diagnostic determinations based on pathophysiological criteria (Van den Bergh et al., 2017). There are certain criteria, such as the absence of objective test findings, that typically rule out conditions with more "explainable" biological origins, and therefore may be more likely to result in MUS-congruent diagnoses (Charles et al., 2019; Lam et al., 2016). The vignettes included in the present study noted previous (six months or one year old) unremarkable test findings per patient report, which may have contributed to the majority of providers selecting certain conditions and ruling out others based on the general algorithmic approach used in medicine.

Recent literature has emphasized the importance of identifying MUS early to ensure proper treatment and avoid iatrogenic harm and unnecessary healthcare costs (Eikelboom et al., 2016; Houwen et al., 2020). Starting appropriate treatment early also helps improve prognosis (Husain & Chalder, 2021). However, it is also important to remember guidelines around when

MUS-related diagnoses or classifications of symptoms are appropriate. For example, prior literature has noted that labeling symptoms as “medically unexplained” should only be considered when an investigation of symptoms has been inconclusive or alternative explanations have been disproven (Fink et al., 2005; Wessely et al., 1999). These guidelines conflict slightly with those from the current Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR), which specifically notes somatoform disorders should not be given simply when other medical explanations are inconclusive. The criteria for somatic symptom disorder in the DSM-5-TR does not exclude somatic symptoms of known medical etiology and is rather focused on the psychological experience of any somatic symptom (American Psychiatric Association, 2022). These conflicting diagnostic criteria may have impacted the providers’ responses when selecting which diagnosis they believed most likely for each case, given priming toward MUS-congruent diagnoses from a medical perspective.

Diagnosis Likelihood. When examining the remaining hypotheses for RQ1 regarding diagnostic likelihood responses (hypotheses 1b and 1c), unexpected trends emerged. Contrary to categorical diagnosis selection, diagnostic likelihood responses did not indicate that symptoms could be primarily attributed to behavioral health compared to medical etiology. For example, IBS is often associated with psychological underpinnings of gastrointestinal distress. However, even when selecting this diagnosis, no significant differences were found between medical and behavioral health attribution of symptoms.

Contrary to expectations, there were no significant differences between conditions representing varied patient characteristics for attributing somatic complaints to either behavioral health or known medical etiology. Female patients with a history of depression and anxiety were not more likely than patients (male or female) without a history of mental health concerns or male patients with a history of depression and anxiety to have their somatic symptoms attributed to behavioral health.

Based on these results, it seems that patient gender and mental health history do not influence diagnostic assessment in the context of MUS for the study sample of providers. These results are inconsistent with prior literature demonstrating gender bias in the diagnostic assessment of MUS. Using a similar vignette patient description, Claréus and Renström (2019) found that a MUS-related diagnosis was more likely to be assigned to a female patient with back pain compared to a male patient with the same symptoms by Swedish general practitioners. Several key differences in study design may have influenced these conflicting findings.

First, the present study found almost unanimous identification of a MUS-related diagnosis when providers were asked to select the most likely diagnosis from a list of options. In order to capture more nuance beyond categorical diagnosis, the present study also included likelihood scales to assess diagnostic assessment along two domains: known medical etiology and behavioral health attribution of symptoms. However, the present study did not capture an open response of specific diagnosis considerations, as several previous studies, including Claréus and Renström (2019) have done. It's possible that these variations in response format produced differences in how providers assessed diagnosis and how the present study captured that.

Another key difference is the provider characteristics. Claréus and Renström (2019) included a sample of 90 general practitioners in Sweden with an average of 20 years of professional medical experience. The present study included primary care providers practicing in the United States with an average of four years of professional medical experience due to the higher percentage of resident physician respondents versus attending-level physicians. Additional research supports that differences in years of professional experience and medical practice location may shape provider views and decision making. A recent study found evidence of substantial mental health stigma among medical students, such that 70% of the students in the study believed people with mental illness are more dangerous than people without mental illness (Brahmi et al., 2022). Prior research has also documented higher levels of implicit bias related to judgments of chronic pain among medical students compared to lower levels in attending-level physicians in the United Kingdom (Schäfer et al., 2016). More research is needed to examine potential shifts in biases and whether additional training among medical professionals positively impacts diagnostic and treatment assessments to reduce the influence of biases. Comparisons between studies in different countries should be interpreted with caution given potential differences in medical training and practice, as well as sociocultural beliefs. Years of professional experience or place of practice (globally and nationally) may be factors that influence decision-making and warrant additional research. While this study has national generalizability, it is still somewhat limited given the sample was predominately medical residents with less professional experience.

Another potential explanation for these inconsistent results is the general complexity of these constructs and decision-making in healthcare settings. While medical professionals often rely on algorithms and quick associations, the reality is that symptoms and experiences vary at an individual level (Charles et al., 2019; McDonald, 1996; Meidert et al., 2023; Peay & Peay, 1998). As such, patients must be assessed and treated holistically, with consideration for the various unique factors across all bioecological levels that may influence their health, while also being mindful of the role of stigma, stereotypes, and implicit biases. Given the complexity of the symptom presentation and considerations regarding diagnosis and treatment, the inconsistent results in the present study could represent ongoing gaps in knowledge and understanding of these types of patient presentations and experiences as well as gaps in knowledge related to psychological factors. MUS encompasses a wide range of symptom experiences, which may be associated with varying degrees of confidence or expertise for providers. The symptoms represented in the present study also represent variations compared with past research. For example, Claréus and Renström (2019) investigated diagnostic assessment for back pain. Perhaps there are different patterns and influences for different symptom presentations as this study examined two different symptom presentations: abdominal pain and generalized pain with fatigue. Further research is warranted to explore factors that may influence differences in the role of biases depending on specific symptoms.

Comparing Medical and Psychological Diagnostic Assessment. Diagnostic assessment data in the present study indicated differences based on mental health history for medical diagnosis considerations and a higher likelihood of behavioral health attribution of symptoms for female patients with a history of mental health concerns compared to other patient characteristics. However, these differences were not statistically significant. In addition, differences were observed between medical and psychological diagnosis considerations for some but not all conditions. Specifically, there appeared to be a greater difference between diagnostic likelihoods for female patients with histories of depression and anxiety compared to other patient characteristics.

Additionally, despite not finding significant differences when comparing diagnostic means, there were significant correlations between medical and psychological assessments, such that medical diagnosis was positively correlated with medical treatment and attributing symptoms to behavioral health was positively correlated with behavioral health treatment. These positive correlations suggest potential trends comparing within-subjects responses between medical and psychological assessment measures, that would not otherwise be captured comparing between-group responses for each diagnosis and treatment variable. For example, comparing across groups for differences in medical diagnosis likelihood does not capture differences between medical and psychological diagnosis likelihoods that may be influenced by patient gender and mental health history for each physician.

Given these differences and the presence of seemingly contradictory findings, additional analyses were conducted to compare the likelihoods of medical and psychological diagnoses for each condition. These analyses revealed several noteworthy findings that enhance the understanding and interpretation of the study's main findings.

For female patients with a history of mental health concerns, providers indicated a greater likelihood of attributing symptoms to behavioral health compared to "explainable" medical factors. While this difference was significant when looking at the combined vignette scores, analyzing the vignettes individually found that this trend was predominantly driven by significant differences in the second vignette, describing symptoms of generalized pain, headaches, and fatigue. Interestingly, providers were also more likely to attribute these symptoms to behavioral health for male patients with no history of mental health concerns. This specific finding should be interpreted with caution. A replication study with a larger sample of physicians is needed to determine whether this is an actual difference or an anomaly in the present findings, potentially due to type I error given the small effect size. Female patients without a history of mental health concerns and male patients with a history of depression and anxiety did not have a significant difference in diagnostic assessment for the same set of symptoms.

Although diagnostic likelihoods did not significantly vary across patient characteristics overall, a notable discrepancy emerged for female patients with a history of mental health concerns. Providers were more likely to consider behavioral health diagnoses than medical diagnoses for these patients. This pattern was less pronounced in other patient groups, where no significant difference was observed between medical and behavioral health diagnostic likelihoods.

These specific findings concerning female patients with mental health histories align with prior research documenting the role of gender bias in the diagnostic assessment of somatic symptoms (Claréus & Renström, 2019). It also extends this understanding by highlighting the additional influence of mental health bias. Similarly, past studies have shown that a patient’s psychiatric history can significantly impact diagnostic decisions (Graber et al., 2000). The present findings also indicate that the size and impact of these biases may vary depending on the symptomatology with which patients present. For example, in the current study, differences emerged in provider decision-making across vignettes describing different symptoms. This suggests that the influence of gender and mental health history may shift depending on the specific clinical presentation. This variability may stem from differences in provider understanding and confidence related to different types of symptoms.

While abdominal pain is a common symptom associated with MUS and related conditions like IBS, providers may feel more confident treating “unexplained” abdominal pain compared to other ambiguous symptoms. Some experts argue that IBS should no longer be considered “medically unexplained” (Mayer et al., 2023), though it may still be classified under different terminology representing MUS, such as persistent physical symptoms (PPS) or non-specific, functional, and somatoform bodily complaints (NFS). These differences in symptom presentations likely influence the extent to which factors like a patient's gender and mental health history affect diagnostic assessment.

At the same time, despite medical guidelines emphasizing the importance of early behavioral health diagnoses for MUS to ensure appropriate treatment and avoid unnecessary harm, a pattern of "medicalization" of MUS persists. For example, a recent study found that physicians in an emergency department (ED) were significantly more likely to assign a medical diagnosis rather than attribute symptoms to "psychosomatic" causes in adolescents presenting with MUS (Hendriks et al., 2024). Additional research investigating this pattern in adults and among physicians in the U.S. is warranted, as this study was conducted in a pediatric ED in Singapore. However, these findings provide recent evidence highlighting continued gaps in applying knowledge about the integration of psychological and physical factors. In turn, these gaps may perpetuate diagnostic uncertainty in cases of MUS, further complicating effective treatment.

Diagnostic Assessment Summary. The primary analyses conducted were unable to answer RQ1 and reject accompanying null hypotheses. There were no significant differences in categorical diagnosis or diagnostic likelihood when comparing female patients with mental health histories to other patient characteristics, including female patients with no mental health history and male patients with and without mental health histories. Additional analyses highlighted differences in diagnostic assessments when comparing medical and psychological likelihoods for female patients with a history of depression and anxiety, which were not observed at a significant and clinically meaningful level for other patient characteristics. These additional findings provide some support and potential evidence of nuanced differences in how patient gender and mental health history impact diagnostic assessments of MUS. Further research is needed to explore these relationships and how patient gender and mental health history may impact diagnostic decisions for ambiguous and persistent physical symptoms.

Treatment Assessment in the Context of MUS (RQ2)

The second research question and associated hypotheses focused on examining how knowledge of a patient's gender and mental health history impacts provider decision-making regarding treatment options when presented with MUS. Results indicated a significant difference across patient characteristics for medical treatment, such that providers were more likely to consider medical follow-up options for male patients with no history of mental health concerns compared to female patients with a history of depression and anxiety. No significant difference was found in behavioral health treatment.

Medical Treatment. Results from the present study found providers were less likely to consider medical treatment options for female patients with a history of depression and anxiety compared to male patients without a history of mental health concerns (hypothesis 2a). These findings suggest patient gender and mental health history impact provider decision-making for treatment plans. There was not a significant difference found between the other conditions, including male patients with a history of depression and anxiety, and female patients without a history of mental health concerns. These results suggest that the difference in medical treatment likelihood was a product of the combined impact of patient gender and mental health history. This further supports evidence of potential biases due to patient gender and mental health history impacting clinical decision-making regarding medical treatment and follow-up in the context of MUS.

These findings are consistent with prior literature and highlight ongoing gender biases regarding MUS in healthcare settings. Studies have continued to document how biases based on patient identities influence provider decision-making for medical follow-up and treatment. Schulman et al. (1999) found that both race and sex predicted the likelihood of being referred for cardiovascular treatment, such that Black individuals and women were significantly less likely to be referred. Despite being a condition with known medical etiology, symptoms of cardiovascular disease are often conflated with mental health concerns in women due to differences in cardiovascular disease presentation between men and women (Maserejian et al., 2009). Regardless of the origins of symptoms, the present study findings along with existing literature highlight how a patient's gender and mental health factors continue to influence provider's judgments, particularly regarding treatment recommendations.

When considering symptoms often associated more with MUS, such as pain, patient gender continues to impact providers' assessment and treatment of those symptoms. One study investigating the influence of patient gender on healthcare providers' judgments regarding chronic pain found that providers were more likely to prescribe analgesics for male patients and psychological treatment for female patients (Schäfer et al., 2016). A thorough review found that gender-related biases in pain assessment and treatment have persisted and that multiple individual and contextual factors interact with patient sex and gender to influence these biases (Fillingim, 2023). Beyond pain symptoms, a recent scoping review found unconscious biases, including regarding patient gender, to be widespread and persistent among healthcare professionals, influencing subsequent treatment recommendations (Meidert et al., 2023). The present study results support existing literature highlighting gender biases associated with the treatment of MUS.

These findings are also consistent with prior research investigating mental health biases impacting medical decision-making. One study published in 2000 found evidence of mental health bias among providers regarding assessment and treatment of somatic complaints. Specifically, using case vignettes describing severe headaches or acute abdominal pain, they found that providers were less likely to believe the patient had a “serious” illness if the patient had a prior history of depression. They were also less likely to order additional tests for those patients compared to patients without a history of depression (Graber et al., 2000). The difference in medical treatment likelihood found in the present study offers consistency with these previous findings, building on them to include the intersection of mental health and gender. Additional research specifically investigating the impact of mental health biases on provider decision-making regarding MUS, and the combination of patient gender and mental health history, is limited.

Beyond MUS specifically, the results of the present study are also congruent with the well-documented mental health biases among healthcare professionals. A recent scoping review concluded that healthcare providers continue to hold biases against individuals with mental health concerns, which negatively impacts clinical decisions (Crapanzano et al., 2023). Additionally, research has suggested that providers have a more challenging time accurately diagnosing physical illnesses when a patient has a comorbid psychiatric diagnosis (Hallyburton & Allison-Jones, 2023). These results further support how biases related to mental health influence diagnostic and treatment assessment and have been linked to diagnostic overshadowing (Molloy et al., 2023). A related study found that diagnostic accuracy for physical illnesses was lower in patients with comorbid depression, particularly when providers ordered fewer tests (Isbell et al., 2023).

One study found that internal medicine residents had significant implicit biases related to depression, associating depression with negative attitudes, uncontrollability, and psychologic etiology (Crapanzano et al., 2018). The study also found that compared to psychiatry residents, internal medicine residents were more likely to associate positive attitudes with physical illness and negative attitudes with depression. These findings suggest continued biases associated with mental health concerns, particularly among primary care providers and primarily resident physicians. The present sample of physicians was predominantly represented by residents, which could have an impact on the degree to which knowledge of a patient's mental health history influences their consideration of medical treatment.

Considering previous findings related to the influence of gender and mental health on medical decision-making in tandem, the present results highlighting a difference in providers' consideration for medical treatment are largely consistent. They also expand on previous findings by highlighting the combined impact of gender and mental health history, which has not been specifically investigated in previous studies.

Behavioral Health Treatment. Despite significant differences in medical treatment likelihood, there were no significant differences in behavioral health treatment likelihood between conditions (hypothesis 2b). Providers in the present study were not more likely to consider behavioral health treatment for female patients with a history of depression and anxiety compared to male patients with or without a history of mental health concerns or female patients without a history of mental health concerns.

These findings contradict a prior study that found providers to be more likely to prescribe psychological treatment for female patients (Schäfer et al., 2016). The present study did not find any significant difference in behavioral health treatment based on the patient's gender or mental health history. Present findings are also inconsistent with a recent study investigating the impact of psychological symptoms on medical advice, which found that psychological symptoms and stressful events resulted in psychological screenings being recommended more than physical ones (Giovannelli et al., 2023). Interestingly, this previous study did not find patient gender to contribute to the differences in treatment recommendations. Findings from the present study differ from this one in a few specific ways. First, the present study found significant differences based on gender and mental health history in medical treatment follow-up but not in behavioral health follow-up. While medical treatment had a lower likelihood depending on patient gender and mental health history, this did not directly translate into a higher likelihood of behavioral health referrals. In addition, the present study found significant differences based on the intersection of patient gender and mental health history, rather than mental health history only.

Considering differential findings treatment considerations, there are several possible explanations for these differential findings. First, they appear consistent with trends observed in real-life scenarios compared to existing research with similar study designs. For example, a prior study investigated management strategies for MUS among real-life consultations and found that interventions were predominantly somatically oriented with less focus on managing psychological factors (Gol et al., 2019). This may further elucidate the presence of biased decision-making in the present findings given there was a significant difference in what may be considered typical practice based on patient characteristics. The differential findings between the two domains may also exemplify how behavioral health and medical treatments are not mutually exclusive. Perhaps this represents growth in understanding and conceptualizing health beyond the outdated yet pervasive biomedical model, including increased consideration of intersecting factors that may need multidisciplinary interventions. However, the presence of differences in medical treatment recommendations between groups in the present study, such that women with mental health concerns may be less likely to receive additional medical testing while men with no mental health history are more likely to receive medical follow-up, suggest otherwise. One could argue this may be appropriate given the difference in mental health history, signifying a potentially justified and reasonable decision to deprioritize medical follow-up as behavioral health interventions may be more appropriate. In the present study, the same trends were not present for the other conditions. For example, male patients with a history of depression and anxiety were not less likely than male or female patients without a mental health history to be referred for medical follow-up, all while presenting with the same set of symptoms. Additionally, there was no significant difference in the likelihood of providers recommending behavioral health treatment between any group.

Comparing Medical and Psychological Treatment Assessment. As with diagnostic assessment, trends and observed data variations in treatment assessments prompted further analysis of within-group comparisons between medical and psychological treatment likelihoods. Additional analyses revealed significant differences in treatment options for some patient characteristics. Providers were notably more likely to consider additional medical testing or follow-up compared to behavioral health follow-up for male patients without a history of mental health concerns, regardless of their specific symptoms. In contrast, no difference between medical and behavioral health treatment likelihoods was found in the other conditions. When considering symptoms of generalized pain and fatigue, providers again favored medical follow-up over behavioral health for both female and male patients without a history of mental health concerns. However, no significant differences were observed in treatment recommendations for patients with a history of mental health concerns, regardless of gender.

Interestingly, despite the tendency to recommend medical follow-up for male patients without a mental health history, the same providers showed a slight, though small and underpowered, inclination toward attributing symptoms of pain and fatigue to behavioral health factors. Given the sample size, this effect should be interpreted with caution. While it suggests a potential trend, future research would be needed to determine whether this effect holds consistently across larger and more diverse provider populations. This preliminary result may indicate a subtle inclination towards recognizing behavioral health factors for male patients even without documented mental health histories, though it could also reflect general uncertainty when assessing MUS. A more robust investigation is required before conclusions regarding this particular pattern can be drawn.

These findings highlight potential incongruencies in the biomedical model. Providers may recognize the influence of behavioral health factors but continue to prioritize medical follow-up, especially for male patients. This is consistent with prior research showing that providers often recommend medical follow-up for MUS, even when guidelines encourage behavioral health interventions (Ring et al., 2005). The persistence of gender biases may influence how symptoms are interpreted and treated based on a patient’s gender identity. Additionally, providers might avoid recommending behavioral health treatment to male patients due to social stigma and biases around men and mental health (McKenzie et al., 2022). These findings also raise the possibility that providers are conducting thorough medical evaluations before considering behavioral health interventions. The fact that this trend was only observed in male patients without a mental health history suggests gender and mental health biases may influence these decisions, warranting further investigation of these factors.

Treatment Assessment Summary. The diagnosis, treatment, and management of MUS continue to be ambiguous and challenging due to gaps in knowledge and understanding and competing views around treatment recommendations (Lehmann et al., 2021). Interestingly, there is evidence of disproportionate rates of physical intervention among patients with MUS, more often proposed by the medical provider than requested by the patient. This is mainly due to provider discomfort and lack of knowledge and empathy regarding MUS (Ring et al., 2005). While it's been previously found that physicians lean more towards medical interventions, such as prescribing medications, due to perceived pressure from patients to explain and resolve symptoms (Lehmann et al., 2021), the present results highlight potential differences in this effect based on patient gender and mental health history. Additional analyses also highlighted differences in treatment assessments when comparing medical and psychological follow-up likelihoods. Expressly, these findings indicated a disproportionate difference in treatment recommendations, favoring medical treatment, for male and female patients without mental health histories. These results in tandem with the between-group comparison findings provide further evidence for differences in treatment assessment of MUS based on patient gender and mental health history.

5.5 Strengths and Limitations

This study aimed to expand on prior literature by investigating how provider biases related to patient gender and mental health influence clinical decision-making for MUS among primary care physicians in the U.S. Several areas of strength, as well as potential limitations, may shape the interpretation and generalizability of the present study's findings.

Gender and Mental Health History

One of the key strengths of this study lies in its exploration of the impact of both patient gender and mental health history on clinical decision-making. Prior research has typically examined these factors separately, with significantly less focus on mental health compared to gender. However, given the historical ties between gender, mental health, and MUS (e.g., hysteria), investigating both constructs in tandem is critical. The current study addresses this gap, offering valuable insights into how these factors intersect and influence provider decisions, a largely underexplored area in MUS research.

This study's representation of mental health history also stands out as a conceptual strength. Depression and anxiety – conditions highly prevalent in MUS – were used to represent mental health concerns. While these are not specific diagnoses themselves based on the DSM-5-TR criteria, they represent the subclinical and clinical symptomatology associated with several diagnoses and are consistent with the terminology often used by medical providers and documented in electronic medical records. The choice to use depression and anxiety to represent mental health concerns is particularly valuable, as prior studies have often focused on less common and more complex conditions, which might elicit more pronounced biases. For example, schizophrenia may be more poorly understood due to lower incident rates and more prominent stigmatization. Depression and anxiety, on the other hand, are common and often comorbid with various somatic symptoms and physical illnesses (Bener et al., 2013). It's estimated that approximately 50% of individuals with MUS have associated anxiety or depression symptoms (Husain & Chalder, 2021). Additionally, depression and anxiety have been found to be associated with the severity of medically unexplained physical symptoms (Rady et al., 2021). Yet their impact on provider decision-making for diagnosing and treating MUS has been relatively understudied (Meidert et al., 2023). The decision to focus on these more prevalent mental health concerns enables a more nuanced understanding of how more representative, everyday mental health biases might impact medical decision-making for MUS. However, while focusing on more prevalent conditions like depression and anxiety provides a broader understanding, it also narrows the scope by excluding other potentially relevant mental health conditions that may elicit different biases.

Additionally, the representation of patient gender as a binary variable limits the study's ability to capture the full spectrum of gender identity. Operationalizing gender in this way is consistent with prior studies and was chosen intentionally for this study as detailed in Chapter 1. While this choice was made intentionally, it is important to recognize the limitations associated with this choice. Investigating patient gender as "female" or "male" is conflating sex and gender to some degree, which are two separate constructs. In addition, this approach fails to capture the broader spectrum of gender identity. While it is helpful and in some ways necessary to explore the influence of patient gender at a dichotomous level, it is important to be mindful of how this may perpetuate a dichotomized and limiting view of gender. For example, this dichotomized approach fails to capture additional gender representations, such as transgender, nonbinary, and genderqueer/gender fluid individuals.

Vignette Design

Vignettes are a key methodological strength, allowing the study to isolate specific variables (i.e., gender and mental health history) while controlling for other factors. Vignettes are well-established in medical research due to their high internal and external validity in studying clinical decision-making (Evans et al., 2015; Meidert et al., 2023). Their use in studying provider perceptions and decision-making specifically related to MUS is also consistent with prior literature (Claréus & Renström, 2019; Lawrence et al., 2013). To further strengthen methodology, this study incorporated expert consultation, piloting with medical students, and followed established guidelines for vignette validity. Multiple vignettes with varied symptomatology were used to explore potential differences in clinical decision-making within the complex MUS phenomenon. This design enhances the study’s validity and improves generalizability by allowing a broader representation of MUS experiences.

However, while vignettes offer a controlled approach, they cannot fully replicate the complex real-world MUS presentations or account for intersecting social identities, which may influence clinical decisions. MUS is a diverse and debated phenomenon, and the vignettes in this study represent only a subset of the possible symptomatology. The inherent simplification required in vignettes may limit their ability to capture the full scope of MUS experiences, reducing the generalizability of findings. For example, MUS terminology is contested due to concerns about stigmatization and misrepresentation, including perpetuating invalidation experienced by patients (Burton et al., 2015; Burton et al., 2024). Some researchers argue that the line between medically “explained” and “unexplained” is not clear-cut, and all symptom experiences may be better conceptualized along a continuum (Barsky & Silbersweig, 2023). A recent growing literature has documented how symptoms and conditions typically associated with MUS can actually be explained, just in ways that differ from typical explanations of medical etiology (Alme et al., 2023; Barsky & Silbersweig, 2023; Reme, 2024). Additional arguments have highlighted that even well-understood medical conditions are comprised of various symptom presentations that sometimes cannot be explained by standard medical testing or don’t respond to typically successful treatments (Van den Bergh et al., 2017). Even nosological frameworks for various conditions typically associated with MUS are complex and overlapping (Kachaner et al., 2023). Furthermore, the growing recognition of the inseparable connection between the physical and psychological challenges the conceptualization of MUS and separation of symptoms that don’t fit known medical etiologies (Rief & Martin, 2014; Van den

Bergh et al., 2017). These factors further complicate efforts to depict MUS in vignette form accurately.

Although the vignettes in this study included varied symptom presentations, they still offer a limited representation of the broader range of MUS experiences. Additionally, real-life clinical decisions are influenced by a multitude of social, cultural, and identity factors – such as race and sex – that are difficult to capture in vignette based research (Maserejian et al., 2009; Schulman et al., 1999). While vignettes allow researchers to control for extraneous variables, they may oversimplify the complexities involved in actual clinical encounters. Though valuable for research, this controlled design lacks the multidimensional nature of real-world patient interactions, where intersecting factors play a crucial role in decision-making.

Even well-considered methodological decisions come with limitations. For example, the manipulation of mental health history in the vignettes was binary: either a history of depression and anxiety was present, or mental health history was not mentioned. While this reflects typical clinical documentation, where the absence of conditions is rarely noted, it introduces a potential limitation. It is possible that explicitly stating the absence of mental health history might have altered providers' responses, reflecting a more nuanced aspect of clinical decision-making.

Decision-Making Domains

Another strength of this study is the inclusion of multiple decision-making domains, assessing both medical and behavioral health along diagnostic and treatment domains. By examining both diagnostic and treatment phases, the study captures a broader picture of how decisions are made in medical practice (Van den Bergh et al., 2017). This is also consistent with prior research investigating medical decision-making (Giovannelli et al., 2023). This comprehensive approach reflects a more holistic understanding of MUS-related care.

Additionally, assessing both medical and behavioral health likelihoods independently recognizes and represents that the two are not mutually exclusive. While we still have a long way to go to dismantle mind-body dualistic perspectives in Western medicine, including multiple domains enhances our ability to explore potential overlap and relationships between domains.

However, the need for a standardized tool for measuring medical decision-making in the context of MUS introduces variability in how these decisions are assessed, in turn limiting comparisons between studies and generalizability. In order to investigate the research questions of this study, complex constructs needed to be distilled into specific measurable variables. This represents a limitation given the variation in general conceptualization of these constructs as well as how these constructs are represented and measured across the literature. Existing literature also needs comprehensive agreement on how these constructs are measured. For example, there is no validated assessment tool of medical decision making for MUS-related conditions, which limits the reliability of measurements used and generalizability/comparison to other studies. The questions included in this study to measure key variables were independently constructed, drawing influence from multiple previous studies. As such, they vary in multiple ways from previous studies. One potential explanation for the findings from this study differing from prior studies could be due to variations in the assessment of medical decision making. For example, the present study operationalized one aspect of diagnostic assessment as a multiple-choice format question with predetermined diagnosis options. This intentional design was chosen to promote ease of response among busy physicians and reduce participant burden. However, it also differs from prior studies, using an open-ended question format to list possible diagnoses with certainty scales for each diagnosis (Maserejian et al., 2009). This design difference may account for one explanation of different findings, including the overwhelming majority of physicians selecting the most likely diagnosis as one congruent with MUS.

Provider Characteristics

This study's inclusion of physicians from across 28 states enhances its generalizability to various healthcare settings within the U.S. This geographical diversity is a significant strength, ensuring that a single region or medical culture does not bias findings. However, the predominance of resident physicians in the present sample limits its generalizability to more experienced practitioners. The average years of professional experience were lower in the present study compared to some previous studies (Claréus & Renström, 2019; Lawrence et al., 2013). While resident physicians represent a crucial segment of the medical workforce, their limited years of experience compared to attending physicians may influence their decision-making processes, thereby affecting the study's findings.

Sample Size and Power

The sample size was sufficient to detect moderate to large effects, allowing for robust statistical analysis of the main research questions for this study. Nevertheless, the sample size may have been insufficient to detect more minor, yet potentially meaningful, effects. Some observed differences and trends between groups were not statistically significant, which could be due to a lack of statistical power rather than the absence of a true effect. This limitation suggests that future research should prioritize increasing sample sizes to detect more nuanced effects, enhancing the robustness of data interpretation and association practice implications.

Strengths and Limitations in Context

This study contributes to the literature on MUS by incorporating both gender and mental health history into its analysis of medical decision-making, using a robust vignette design, and including multiple decision-making domains. However, these strengths must be considered alongside the limitations of the study, including the binary operationalization of gender, the constrained scope of MUS symptomatology, and the challenges in generalizing findings to more experienced physicians or smaller effect sizes. Future research should aim to expand the representation of gender diversity, broaden symptomatology, and recruit a more experienced and larger sample to build on these findings.

5.4 Implications

Implications for Research

More research is needed to understand the impact of both patient gender and mental health history on provider decision-making, particularly for symptoms of unclear etiology. Additional research can help disentangle these complex constructs and their associations with medical decision-making. It will be critical for further research to help establish consistency and guidelines around investigating medically unexplained symptoms and provider decision-making. These two constructs continue to need more uniformity in conceptualization and measurement across the literature, an issue that likely impacts differences in findings and the ability to compare studies.

The present study focused on a dichotomized gender variable, consistent with the study design used in previous research studies. More research is needed to understand the impact of a broader range of gender identities and presentations, particularly concerning more marginalized gender identities. While some research has investigated other intersecting identities and patient characteristics, such as race/sex and mental health/religion, more research is needed to understand better how the combination of different patient characteristics influences clinical decision-making. This is particularly important given that identity exposure cannot be controlled in real-life interactions as it can be in vignettes. There is also evidence supporting potential differences in stigma and implicit biases depending on provider identities (Kluemper et al., 2021). Future research should consider investigating these further in the context of MUS in addition to concordant or discordant identify factors between patients and providers to examine the potential impact on assessment and clinical decision-making. To better translate research findings into practice and policy implications, it is essential to have a comprehensive understanding of these constructs and how they relate to one another.

The present study also intentionally focused on knowledge of a history of mental health symptoms, operationalized as depression and anxiety. Additional research is necessary to explore current mental health symptoms and diagnoses to see how co-occurring concerns, whether or not directly influencing each other, impact clinical decision-making for MUS. There may be a differential influence of current mental health concerns compared to past mental health concerns. As with considerations for gender, future research should incorporate considerations for the impact of provider mental health experience, both personally and in terms of professional training.

Given these findings along with others, additional research exploring clinical decision-making more broadly should consider and account for potential influences of patient gender and mental health history. Both have the potential to impact the diagnostic and treatment assessments to varying degrees.

It is also important to investigate factors beyond the individual level that may influence patient-provider interactions and general healthcare practices. For example, how does the length of time for consultations, insurance reimbursement, or environmental factors influence these interactions and subsequent outcomes, including treatment plans? In addition, differences between specialties, including variations between internal medicine and family medicine, may impact clinical decision-making regarding MUS and mental health more broadly in unique ways and requires additional investigation.

Given the differential findings based on specific symptoms, future research should aim to explore a wider range of symptom presentations typically associated with unclear medical etiology, difficulty treating with typically successful treatments, and a patient's feeling of being invalidated or dismissed. Relatedly, this area of research and practice would likely benefit from increased cohesion and clarification around appropriate terminology, as this is a continued area of debate with different terms being used throughout the literature. In addition, more research is needed to investigate the complexity due to higher rates of MUS-related conditions, such as fibromyalgia and chronic fatigue syndrome, as well as psychological symptoms more broadly among women. Future research and frameworks should consider the implications of this thoughtfully to acknowledge both the evidence of higher rates among women and the potential for this to be a continued belief in the debunked concept of hysteria and broader gender differences in healthcare.

The phenomenon of MUS is complex for both patients and providers to manage. A more thorough framework can help provide clarity and structure for ongoing research as well as potential shifts in practice. This type of framework should also be intentional about the integration of both provider and patient experiences to avoid judgment or invalidation to the extent possible. There have been attempts to create and shift existing frameworks around the conceptualization of MUS, including expanding on existing misattribution and amplification models while also emphasizing the imperative of unlearning mind-body dualism (Van den Bergh et al., 2017). Additionally, there have been efforts to provide frameworks around treatment aspects, such as patient-provider communication (Burton et al., 2015; Burton et al., 2024). It is unclear whether these frameworks have been considered or adopted by broader medical practice in the U.S.

Furthermore, there is still a need for more comprehensive frameworks that expand on the biopsychosocial and bioecological models of health to bridge the gap between the conceptualization of symptom experiences and the management or treatment of those symptoms. Specifically, future research is needed to explore the potentially different pathways between diagnosis and treatment based on symptom presentation and acuity. This may require a framework that includes all symptoms and health conditions (physical and psychological), rather than a model just for attempting to understand ambiguous or psychosomatically associated symptoms. In addition, it may require moving beyond assumptions of single treatment pathways as typical to more reductive treatment approaches. Much of the current literature continues to perpetuate mind-body dualistic perspectives, rather than more holistic understandings of health. These types of symptoms and patient experiences should not be simplified into an all-or-nothing approach. More recent literature has highlighted that these types of symptoms can be explained and treated (Reme, 2024). It is fundamental to reduce the stigma associated with mental health concerns and psychological treatment to improve the integration of both assessment and treatment approaches. Expanding on the existing literature and frameworks for understanding these experiences is fundamental, particularly for fostering meaningful changes to clinical practice.

Implications for Practice

Beyond research, it is critical that these results are expanded to practice considerations and meaningful changes that help address these symptoms and experiences. The present findings highlight ongoing patterns of differential medical treatment based on patient identities and backgrounds. They provide further evidence of the importance of enhancing equity in healthcare to ensure all patients, regardless of their identities, are treated fairly and appropriately. It is necessary to increase awareness of implicit biases to intentionally counteract them as much as possible while working to reduce broader societal stigmas rooted in and perpetuated by systemic factors. MUS are particularly vulnerable to these sources of stigma given they remain poorly understood and have overlapping assumptions about patient gender and mental health history.

Patients often have negative reactions when their symptoms are associated with mental health concerns (Dusenbery, 2018). While there is significant and growing research documenting the intersectionality of physical and psychological health, how this information is shared with patients requires additional focus to ensure patient concerns are validated. Additionally, patients would benefit from being informed about how various experiences may impact their health. In alignment with recent research, approaching MUS with patients would likely benefit from ensuring patients know their concerns are valid and real, even if they may be best explained by psychological factors (Alme et al., 2023). Continued gaps in understanding regarding MUS and mental health raise questions about how to appropriately name and talk about these types of experiences in a way that is validating and helpful. This is important to ensure patients feel heard and simultaneously understand various influences on their health. Additionally, improved communication can lead to more effective pairings with treatment options to reduce the overall burden on providers and the healthcare system.

There is a growing call to action in the literature representing the phenomenon of MUS requesting a change in the narrative to emphasize that the absence of a known biological origin of symptoms does not make them less real (Alme et al., 2023). The current frameworks in medical practice do not align with growing evidence supporting the broader range of causes of physical symptoms and the reality of the mind and body being intrinsically linked with bidirectional influences. We need a new and more comprehensive framework that includes more integration of holistic care perspectives. The biopsychosocial model is a bridge to this but is also limited by its need for more specificity and depth to be applied more effectively (Van den Bergh et al., 2017). This study's results lend support to this call to action by highlighting ongoing differences in how symptoms are assessed and treated. The field needs an improved understanding of these symptom experiences, including the often valid and appropriate connection to mental health factors and improved communication regarding these intersections.

The call to action for shifting the narrative around how we conceptualize symptom experiences and classify their causes is limited by factors that need to be addressed across multiple bioecological levels. A recent scoping review documented evidence of MUS stigmatization as a structural issue and the necessity of exploring it further at this level to create meaningful practice changes (Treufeldt & Burton, 2024). It is necessary to ensure providers have adequate training and understanding of these experiences and are well-connected to a variety of accessible treatment options, including behavioral health. However, various factors also limit providers, including burnout and lack of time. They often have to address multiple patient concerns within a brief 15-minute appointment, impacting the extent to which concerns can be heard and likely reducing their decision-making capacity to rely on quick heuristics. This likely also contributes to limiting their empathy for patient experiences, particularly when concerns are less well understood or deviate from the typical disease models (Ring et al., 2005). Addressing changes at the individual or relationship level, for example through communication efforts, may not be enough to impact the broader structural sources of stigma contributing to the difficulty assessing and treating MUS (Treufeldt & Burton, 2024).

Additionally, the healthcare system, like many other larger systemic structures, continues to be influenced by pervasive patriarchal perspectives, perpetuating deeply rooted biases related to various identity factors, including gender and mental health history. Biases and inequities in medical treatment are also impacted by the larger system and structural factors, including medical education and training, insurance coverage (e.g., coverage of behavioral health diagnoses and treatments), and societal norms and expectations (including varying cultural perspectives around mental health concerns). A recent narrative review illustrated how cultural and socioeconomic factors, such as health literacy, previous healthcare experiences, and socioeconomic status, have been identified as predictors of individual somatic symptom perception and healthcare utilization (Mariman et al., 2021). In order to implement effective changes and reduce the impact of pervasive sexism and biases/assumptions based on mental health, multiple ecological levels need to be targeted.

Integrated behavioral healthcare is one avenue that can help address some of the ongoing challenges with MUS. Greater collaboration between medical and psychological providers is needed to address the points of intersections in various symptoms and comorbid symptomatology. Integrated behavioral healthcare is even valuable to medical conditions with known etiology, particularly if they are causing distress, impairing functioning, or associated with significant life adjustments. Relatedly, it is imperative to recognize how numerous factors can impact health conditions and multiple treatment options may be appropriate. One treatment approach does not exclude others. For example, referring for behavioral health support does not disqualify or rule out additional medical testing or pharmacological interventions. Despite growing recognition and implementation of integrated care, many primary care providers still need to receive training or experiences from these perspectives. Less than one-third of physicians from this study had additional training experience in integrated behavioral healthcare. Given this sample is composed primarily of physician residents, this suggests additional focus and training regarding integrated care approaches are still needed in medical training.

In addition to structural changes regarding healthcare systems and medical training, there is also a need for normalizing mental health concerns at a societal level to reduce associated stigmas that contribute to stereotypes, negative assumptions, and implicit biases. Doing so has the potential for downstream positive shifts among patients and providers, including how providers conceptualize and treat MUS and how patients understand and adhere to treatment recommendations.

The complexity associated with medically unexplained symptoms exemplifies the continued imperative to view health holistically and, as such, to retire perspectives and approaches that view the mind and body as separate, distinct entities requiring different approaches and connoting different meanings. The phenomenon of MUS is just one, albeit highly prevalent, example of how truly interconnected the mind and body truly are. The psychological and the medical are inextricably linked. While shifting these perspectives in healthcare settings and training for healthcare professionals is critical, so are broader societal shifts that decrease mental health stigma and recognize the very real impact of psychosocial factors on our body and physical health.

5.5 Conclusions

Results from the present study revealed a significant effect of patient gender and mental health history on medical treatment decisions. Providers were less likely to recommend medical follow-up to female patients with a history of depression and anxiety compared to male patients without mental health histories and the same symptom presentation. Additionally, when isolating symptoms of generalized pain and fatigue, providers indicated a greater likelihood of attributing the symptoms to behavioral health versus medical etiology for female patients with a history of depression and anxiety. Conversely, for patients without mental health histories, providers favored medical follow-up over behavioral health intervention, regardless of patient gender. No significant differences emerged for diagnostic assessment or behavioral health treatment recommendations across groups.

Despite contradictions between the existing literature and the present study's findings, the nonsignificant findings continue to support and build on our understanding of how patient gender and mental health history influence provider decision-making in the context of MUS. For example, it is notable that despite no significant differences in diagnostic assessments, a difference in treatment likelihood was observed. The findings from this study continue to highlight the impact of patient gender on medical decision-making. Additionally, they add consideration of mental health history, which is particularly important given the historical associations between gender and mental health rooted in hysteria and sexism more broadly. While the primary findings did not indicate significant differences in diagnostic assessment when comparing different patient characteristics, additional analyses highlighted within-subjects differences for only some of the groups of patient characteristics. The overall trends of these findings are consistent given the most significant differences presented among female patients with a history of depression and anxiety and male patients with no mental health history, the two most opposing groups. There were also more significant differences in treatment compared to diagnosis, particularly when isolating generalized pain and fatigue symptoms, suggesting potential incongruencies in how the two are assessed.

As a whole, these findings suggest that patient gender and mental health history influence provider decision-making regarding the management of MUS, particularly regarding medical follow-up. Variations in the present findings elucidate potential differences in the impact of patient characteristics on clinical assessment based on symptomatology and decision-making domain, further supporting the need for additional research. These findings also highlight the continued need for strategies to reduce stigma and associated biases and improve equity in clinical decision-making.

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APPENDIX A. CORRELATIONS OF STUDY VARIABLES

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Condition	–											
2. Medical Diagnosis (V1)	.02	–										
3. Behavioral Health Diagnosis (V1)	-.15	-.06	–									
4. Medical Treatment (V1)	.15	.02	-.09	–								
5. Behavioral Health Treatment (V1)	-.12	.01	.43**	-.07	–							
6. Medical Diagnosis (V2)	-.03	.56**	.14	.24**	.12	–						
7. Behavioral Health Diagnosis (V2)	-.10	-.01	.54**	-.16	.24**	-.07	–					
8. Medical Treatment (V2)	.17	.32**	-.04	.40**	.06	.33**	-.19*	–				
9. Behavioral Health Treatment (V2)	-.02	.02	.35**	.00	.58**	.01	.46**	-.03	–			
10. Medical Diagnosis (combined)	-.02	.89**	.05	.10	.07	.88**	-.04	.37**	.02	–		
11. Behavioral Health Diagnosis (combined)	-.15	-.03	.90**	-.15	.37**	.04	.87**	-.13	.45**	.03	–	
12. Medical Treatment (combined)	.18*	.15	-.10	.86**	-.04	.34**	-.21*	.82**	-.01	.21*	-.19*	–
13. Behavioral Health Treatment (combined)	-.08	.03	.41**	-.06	.91**	.08	.39**	.02	.88**	.06	.42*	-.06

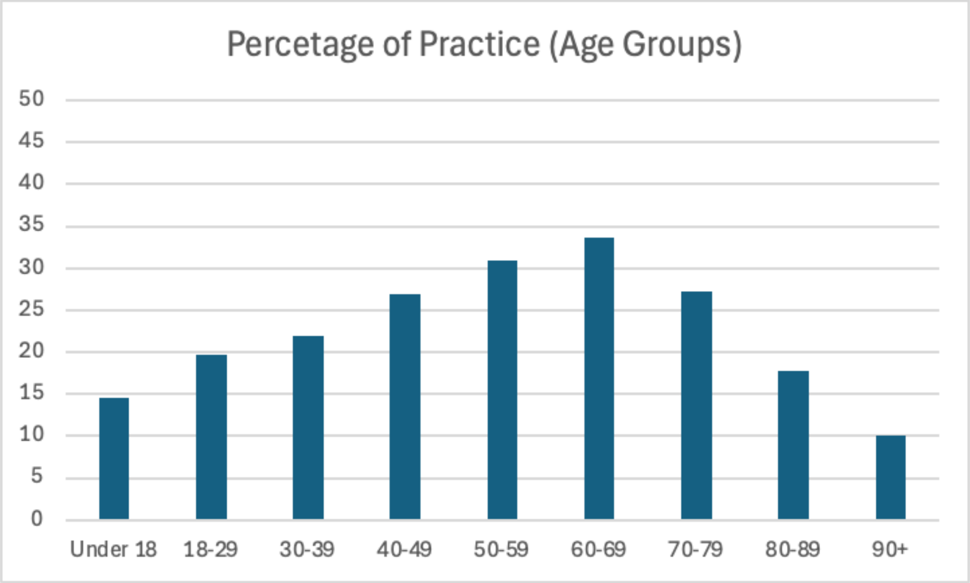
* indicates correlation is significant at the 0.05 level (2-tailed)
** indicates correlation is significant at the 0.01 level (2-tailed)

APPENDIX B. STATE OF CURRENT PRACTICE

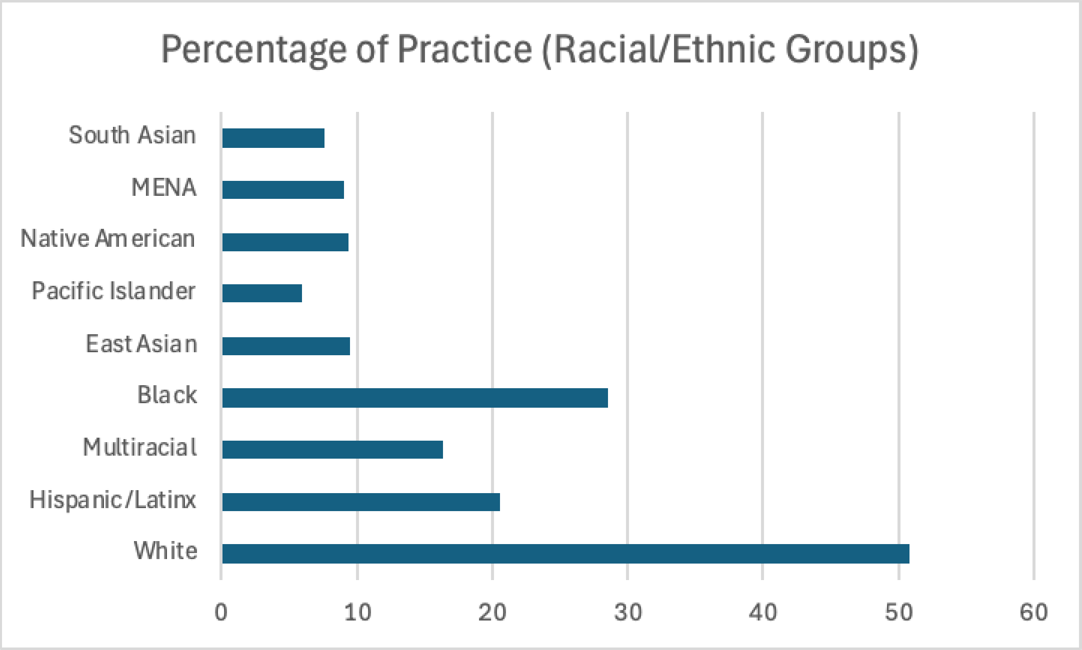
State of Practice (*n* = 134)	*n*	%
Alabama	1	1%
California	10	7%
Colorado	2	1%
Connecticut	1	1%
Florida	2	1%
Illinois	5	4%
Indiana	7	5%
Iowa	3	2%
Maryland	1	1%
Michigan	6	4%
Mississippi	1	1%
Nebraska	6	4%
New Hampshire	2	1%
New Mexico	2	1%
New York	5	4%
North Carolina	8	6%
North Dakota	2	1%
Ohio	12	9%
Oklahoma	3	2%
Oregon	5	4%
Pennsylvania	10	7%
South Carolina	7	5%
Texas	8	6%
Utah	4	3%
Vermont	2	1%
Virginia	5	4%
Washington	2	1%
Wisconsin	12	9%

APPENDIX C: GRAPHS OF PRACTICE CHARACTERISTICS

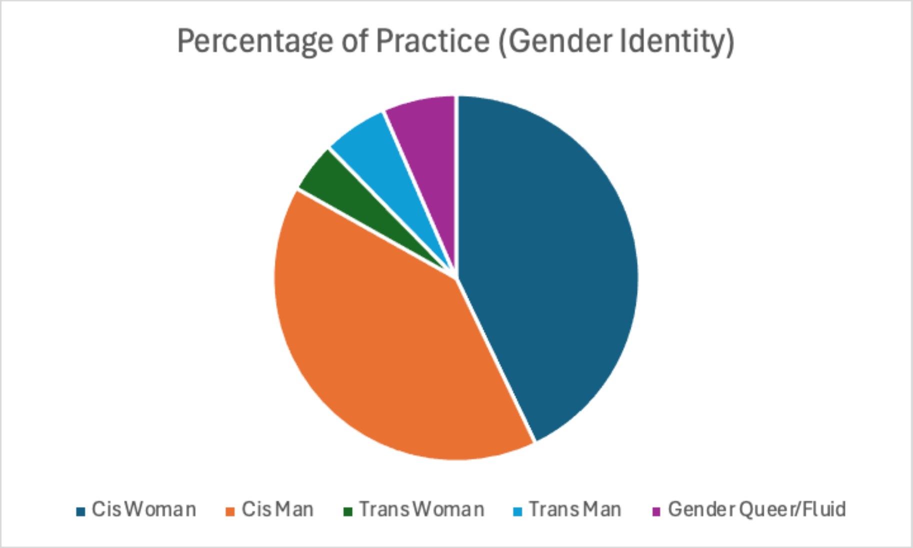
1. Graph of average practice representation for age groups reported by physicians



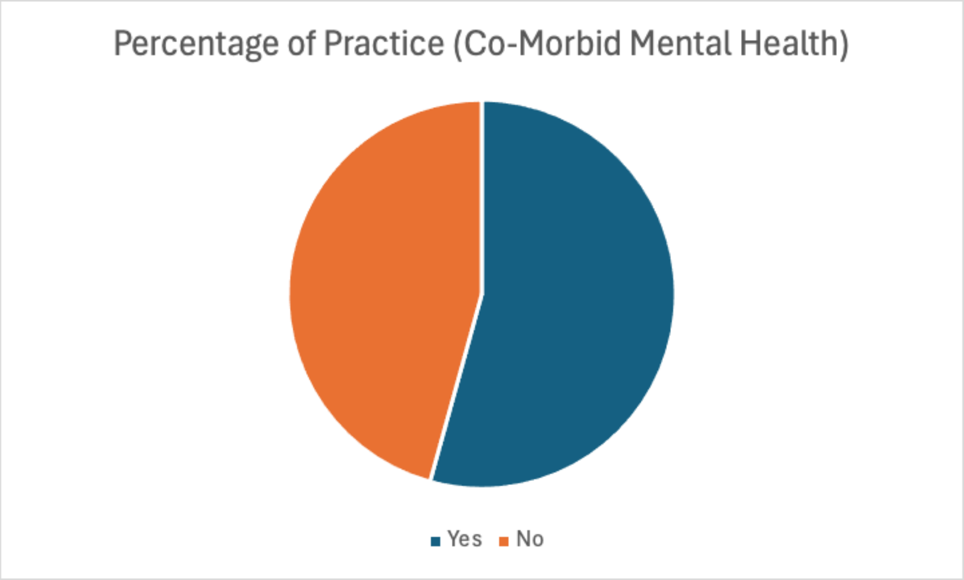
2) Graph of average practice representation for racial and ethnic groups reported by physicians



3) Graph of average practice representation for gender identity reported by physicians

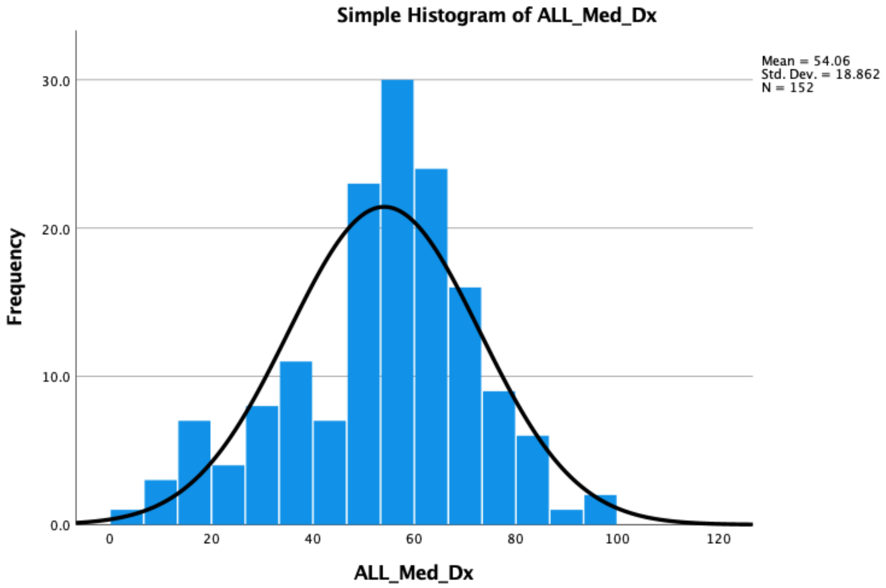


4) Graph of average practice representation of co-morbid mental health concerns reported by physicians

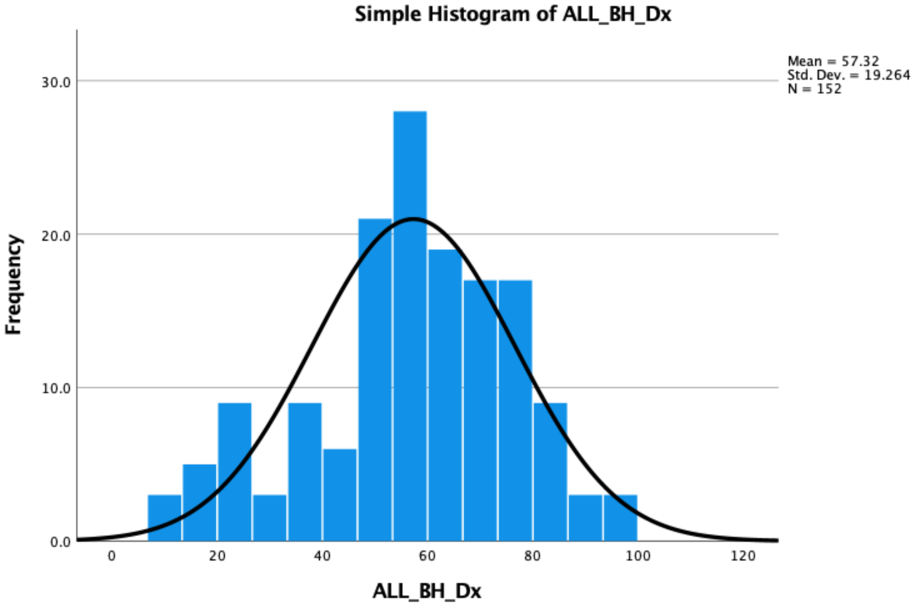


APPENDIX D: HISTOGRAMS OF DIAGNOSIS AND TREATMENT LIKELIHOOD

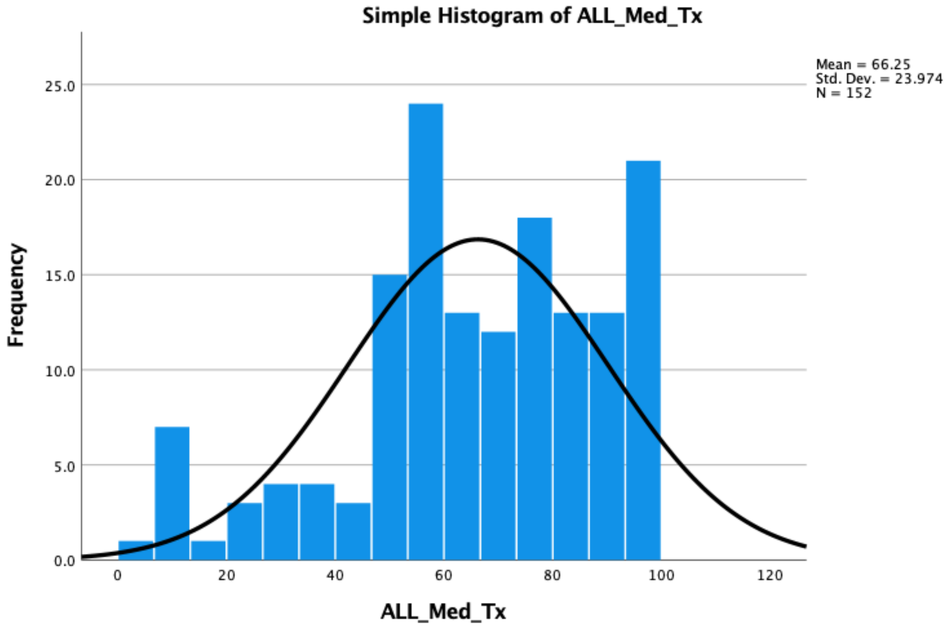
1. Histogram of medical diagnosis likelihood responses



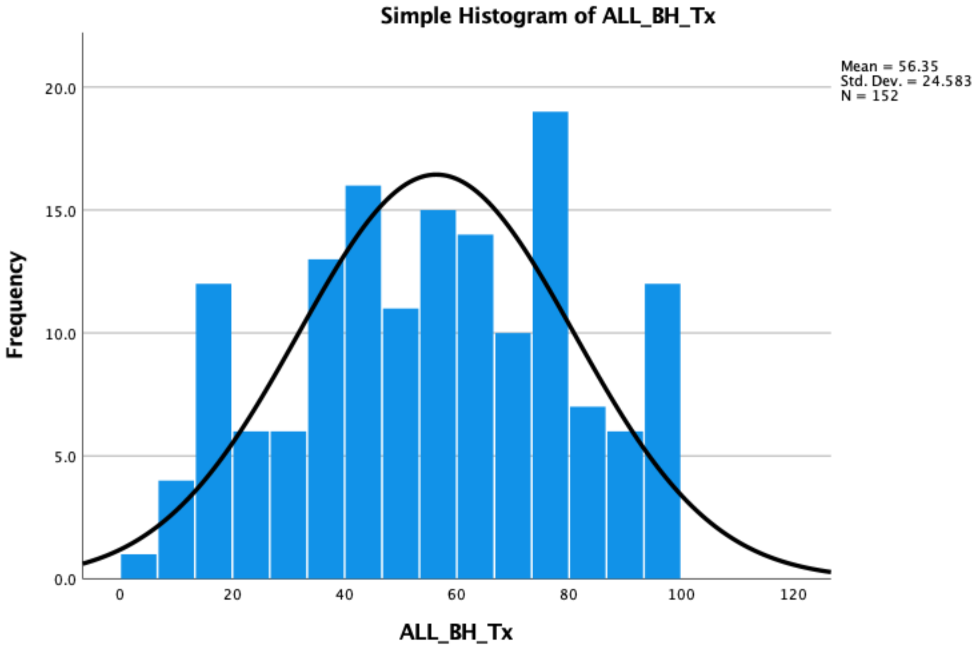
2. Histogram of behavioral health diagnosis likelihood responses



3. Histogram of medical treatment likelihood responses

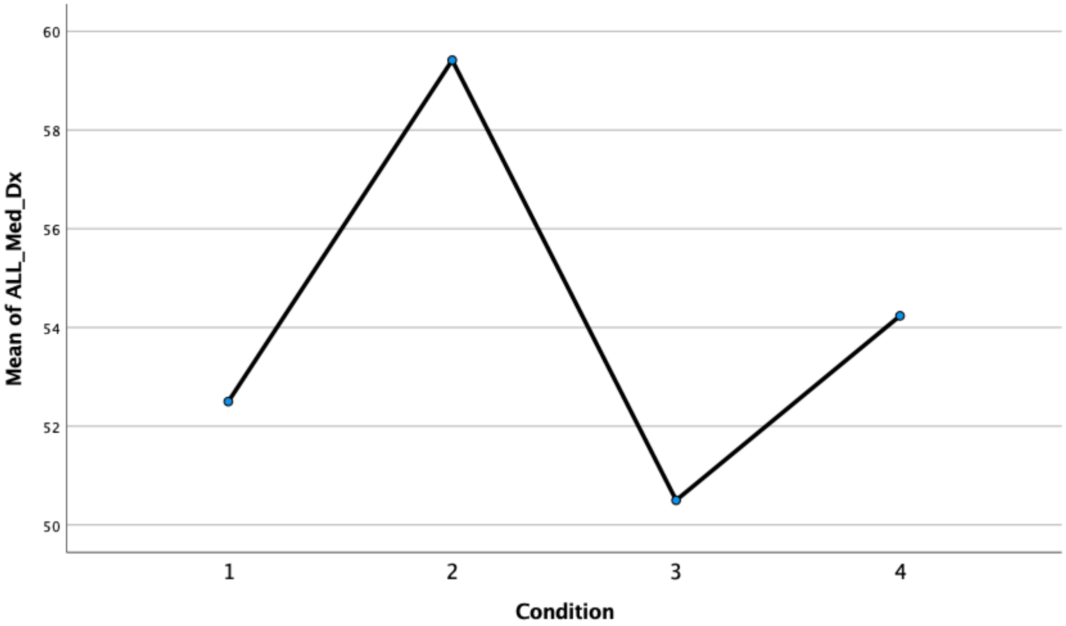


4. Histogram of behavioral health treatment likelihood responses

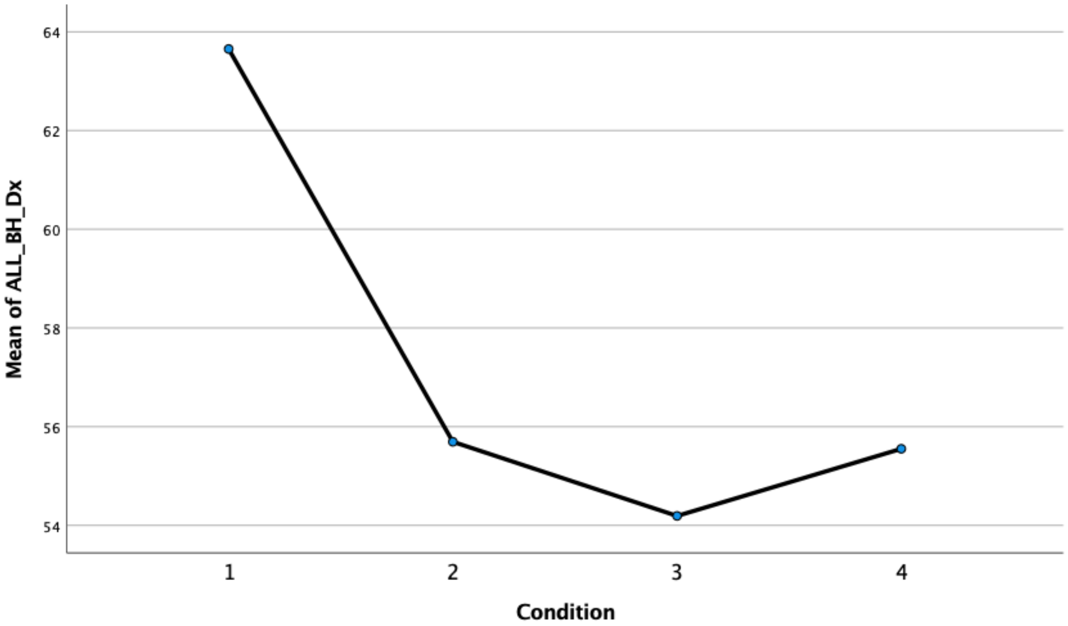


APPENDIX E: MEAN PLOTS OF DIAGNOSIS AND TREATMENT LIKELIHOOD

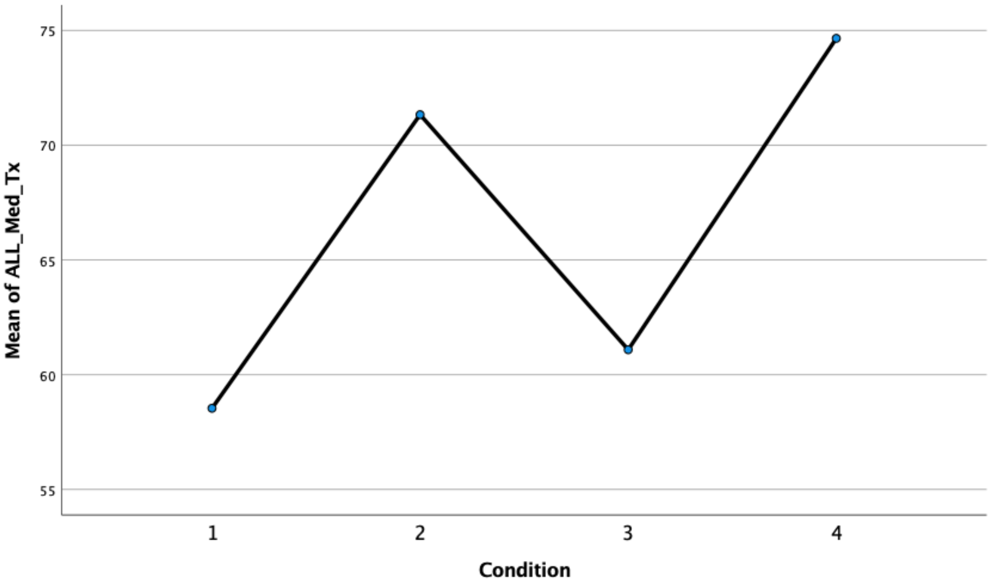
1. Mean Plot for combined averages of medical diagnosis likelihood across conditions



2. Mean Plot for combined averages of behavioral health diagnosis likelihood across conditions



3. Mean Plot for combined averages of medical treatment likelihood across conditions



4. Mean Plot for combined averages of behavioral health treatment likelihood across conditions