BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-033410
Article Type:	Research
Date Submitted by the Author:	05-Aug-2019
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Keywords:	COMPLEMENTARY MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, QUALITATIVE RESEARCH, PUBLIC HEALTH

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A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

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Word Count: 4953

ABSTRACT

Introduction: *Medical pluralism*, or concurrent utilization of multiple therapeutic modalities, is common in various international contexts, and has been characterized as a factor contributing to poor health outcomes in low-resource settings. Traditional healers are ubiquitous providers in most regions, including the study site of southwestern Uganda. It is not well understood why patients in pluralistic settings continue to engage with *both* therapeutic healthcare modalities, rather than simply selecting one or the other. The goal of this study was to identify factors that motivate pluralistic healthcare utilization, and create a general, conceptual framework of pluralistic health behavior.

Methods: In-depth interviews were conducted between September 2017 and February 2018 with patients seeking care at traditional healers (N=30) and at an outpatient medicine clinic (N=30) in Mbarara, Uganda; the study is nested within a longitudinal project examining HIV testing engagement among traditional healer-utilizing communities. Inclusion criteria included age ≥18 years, and ability to provide informed consent. Participants were recruited from healer practices representing the range of healer specialties. Following an inductive approach, interview transcripts were reviewed and coded to identify conceptual categories explaining healthcare utilization.

Results: We identified three broad categories relevant to healthcare utilization among study participants: 1) traditional healers treat patients with “care”; 2) biomedicine uses “modern” technologies; and 3) peer “testimony” influences healthcare engagement. These categories describe variables at the healthcare provider, healthcare system, and peer levels that interrelate to motivate individual engagement in pluralistic health resources.

Conclusions: Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which influence patients’ therapeutic itineraries. Our findings provide a basis to improve health outcomes in medically pluralistic settings, and underscore the importance of recognizing traditional healers as important stakeholders in community health.

Word Count: 297 (300 words max)

Keywords: Medical pluralism, Uganda, traditional healers, qualitative

STRENGTHS AND LIMITATIONS OF THIS STUDY

- Medical pluralism is common in both high- and low-resource settings, and has been characterized as a factor leading to poor health outcomes for both infectious and non-communicable diseases
- This study identifies factors that motivate utilization of healthcare in a medically pluralistic community
- Patients in pluralistic settings perceive clear advantages and disadvantages of both traditional care and biomedicine; characteristics of healthcare providers, the healthcare system, and peer influences motivate patients to engage with particular healthcare modalities
- Patients often prefer traditional healing instead of biomedicine; this utilization is not simply a function of limited access to biomedical resources
- Traditional healers should be considered important stakeholders in community health

INTRODUCTION

Medical pluralism, or utilization of multiple therapeutic modalities, is common where both biomedical and complementary or alternative treatments are available to patients. This pattern of healthcare engagement is observed in both high-[1,2] and low-resource settings[3-5], and is well described for patients with both acute[6-8] and chronic illness[3,9-11] in various international contexts.

In low- and middle-income countries, traditional medicine is utilized instead of, or in concert with, biomedical therapies. Traditional healers have been defined by the World Health Organization as: 1) persons recognized by local community as healers; 2) having regular patient attendance; and 3) having space to receive and treat patients[5]. They "provide health care by using plant, animal and mineral substances, and other methods based on social, cultural, and religious practices" [12]. Prior work in medically pluralistic contexts shows that initial choice of therapeutic modality is driven by patients' perceived etiology of illness, and provider trustworthiness[13-16]. Patients may switch modalities in the setting of treatment "failure", when symptoms worsen or persist despite treatment[13,17].

Medical pluralism has been characterized as a central factor contributing to poor health outcomes. For example, researchers have shown that use of traditional medicine delays HIV testing and ART initiation[18], and interrupts HIV treatment[13], for people living with HIV (PLHIV) . In Mozambique, PLHIV initially seeking care from traditional healers experienced significantly longer delays to diagnosis compared with those who did not utilize healers; this delay exponentially increased with corresponding increases in the number of healers consulted prior to receiving HIV testing[18]. In South Africa, medical pluralism was shown to be negatively associated with ART use in a cohort of PLHIV[19]. Research has also demonstrated that medical pluralism contributes to poor outcomes for non-infectious diseases, such as nonadherence to chemotherapy for cancer[4,11], or poor outpatient linkage to care for patients with hypertension[11].

In many parts of the world, traditional healers are extensively utilized; for example, it is estimated that 80% of the population in sub-Saharan Africa visit traditional healers[5]. Traditional healer utilization may be partially attributed to accessibility: healers are present in higher numbers than physicians and biomedical resources, particularly in low-

resource settings[5]. However, their popularity cannot be strictly explained by convenience; research in urban regions having high density of biomedical facilities demonstrates similar reliance on traditional healers[1,3]. Patients also seek traditional therapies to address symptoms attributed to ancestral curses or bewitching, believed incurable by biomedicine[20]. Use of traditional medicine is also strongly tied to local religious and ethnic identities[21].

Biomedical and traditional healers offer distinctive forms of healthcare for patients. In medically pluralistic contexts, it is not well understood why patients continue to engage with *both* therapeutic healthcare modalities, rather than simply selecting one or the other. There have been many disease-specific studies that describe factors influencing pluralistic therapeutic itineraries[17,19,22], but there remains a dearth of knowledge on variables that shape healthcare engagement generally in these communities. The goal of this study was to identify factors that motivate pluralistic engagement with healthcare resources, using qualitative research methods. We sought to characterize salient perceived advantages and disadvantages of each modality, and explain pluralistic therapeutic itineraries in a sub-Saharan African context. These data were used to develop a general, conceptual framework that can inform future research on pluralistic health behavior.

METHODS

Study Setting and Design

This qualitative study was conducted in Mbarara District, Uganda, a district of 418,000 residents located ~275 km southwest of the capital city of Kampala. Southwestern Uganda is a medically pluralistic context, where both traditional and biomedical modalities of healthcare co-exist [23-25]. In this region of sub-Saharan Africa, traditional healers practice herbalism and spiritual healing; they also set broken bones and attend births in the community. Spiritual healers attribute their powers to the *Bachwezi*, which are believed to be ancestral spirits from an ancient kingdom that previously occupied this region of eastern Africa[26,27]. This qualitative study was conducted as part of a multi-year, mixed methods study of HIV services engagement in a medically pluralistic community.

Sampling and Recruitment

Following a purposive sampling strategy, sixty (N=60) adults were identified to participate as key informants in this study, or "individuals that are especially knowledgeable about or experienced with a phenomenon of interest"[28]. In our case, key informants were selected to represent variation in experiences of receiving modalities of healthcare: biomedical and traditional. That is, participants were patients representing two subgroups: (1) individuals receiving treatment from traditional healers (N=30), and (2) individuals receiving treatment from a biomedical general medicine outpatient clinic (N=30). Inclusion criteria for all participants were: 1) age ≥18 years; 2) ability to provide informed consent; and 3) seeking healthcare at either a traditional healer or outpatient biomedical clinic in Mbarara District.

A target sample size of thirty participants per subgroup was guided by prior research suggesting that a range between 20 and 30 interviews is adequate to reach *thematic saturation*, the point at which no new concepts emerge from subsequent interviews[29-31]. Two authors (RS and JMA) reviewed transcripts as they were completed and corresponded weekly to identify and discuss emerging themes. After twenty-five

interviews per group were conducted, the two authors agreed that interview content no longer contained new or surprising content. Five additional interviews per group were conducted to confirm thematic saturation.

Participants in the traditional medicine subgroup were recruited from twelve traditional healer practices which reflected the range of specialties in this region (herbalist, bone setter, traditional birth attendant and spiritual healer). For the purposes of this study, we excluded Christian-based spiritual healers (i.e., "Born Again" or Pentecostal ministers). Participants in the biomedical subgroup were recruited from Mbarara Municipality Clinic, a general outpatient government-run clinic in the city of Mbarara, which serves approximately 50,000 patients per year.

Healers gave permission for study staff to recruit patients at their practices. At both traditional and biomedical facilities, research assistants approached patients following completion of visits healing sessions to assess eligibility and interest in participation. Recruitment was carried out over a period of six months (September 2017 - February 2018);

Data Collection

Data collection for this study consisted of a single in-depth interview, conducted by Ugandan research assistants (RAs) trained in qualitative research methods. Interviews followed an interview guide that included the following topics: 1) details of the patient's therapeutic itinerary for his/her current symptoms; 2) symptoms that motivated him/her to seek healthcare; 3) attitudes towards, and experiences with, traditional and biomedicine; and 4) details of concurrent or recent biomedical and traditional healer visits. Interviews lasted approximately one hour and were conducted in the local language (Runyankore), in private locations at either healer practices or at the participating biomedical clinic. Participants received the equivalent of 10,000 Ugandan Shillings (UGX, ~$3 USD) in household staples (cooking oil, sugar, salt, soap) in recognition the time and effort required to participate in the interview.

Interviews were digitally recorded, then transcribed and translated into English by the same RA who had conducted the interview. All transcripts were produced within 72 hours of the interview being completed. The transcripts were reviewed by the first author for quality, content, and to provide feedback to the RAs regarding interviewing techniques. English transcripts were spot-checked against audio recordings by an author (JMA, who is fluent in Runyakore and English) to ensure validity and integrity of translations.

Analysis of Data

A three-step, inductive approach was used to analyze the qualitative data, as follows: (1) development of codes; (2) coding; and (3) category construction.

Development of Codes.

Following an inductive approach to qualitative data analysis, interview transcripts were reviewed by the first author (RS) concurrently with data collection to identify an initial set of codes, or labels that described key concepts in the dataset. The inductive strategy provided overlap between qualitative interviewing and data analysis, allowing for iterative engagement with the dataset to identify emerging concepts of interest. As additional transcripts were produced and reviewed, codes were reviewed and refined to fit the data. Using the "constant comparison" method, newly coded text segments were

compared to text segments previously marked with the same code to determine if they reflected the same concept[32]. This process was repeated until all transcripts had been reviewed. A final list of codes was produced through discussion and consensus among three co-authors (RS, JMA and RK).

Coding:
All study transcripts were coded, and re-coded when necessary, using the finalized list of codes. QSR NViVo 11 (QRS International Pty Ltd) was used for coding and data organization, but not in development of codes.

Category Construction:
Next, coded data were examined and grouped to form conceptual categories, where data are aggregated based on similarities of meaning. Categories are defined below using text examples. Quotes from participants are shown as italicized and indented. Interrelationships between categories were identified to create a conceptual framework illustrating factors that influence pluralistic health behavior (Figure 1).

Ethical Statement:
This research was approved by the Human Research Protections Program Institutional Research Board at the University of California, San Diego (#170672), Weill Cornell Medical College (#1803019105), Mbarara University of Science and Technology Research Ethics Committee (#16/01-17) and the Ugandan National Council for Science and Technology (#SS4338). Participants provided written and verbal informed consent in Runyankore.

RESULTS

Characteristics of Participants

Characteristics of study participants appear in Table 1. Over half of the sample had clinical experience with both biomedical and traditional modalities of healthcare. However, pluralistic behaviors were much more common among patients of traditional healers. The vast majority of participants recruited from the biomedical clinic denied prior experience receiving care from traditional healers (n=28/30, 93%); in contrast, *all* (n=30) traditional healer patients report prior experience receiving biomedical treatment.

TABLE 1. CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristic	Traditional healer clients (N=30)	Biomedical clients (N=30)
Had previously received care from alternate modality	N=30 (100%)	N=2 (7%)
Age (in years)	36.7 (mean)	31.6 (mean)
Female gender (%)	N = 16 (53%)	N= 18 (60%)
Primary school education or less	N= 14 (47%)	N = 13 (43%)
Household size (in persons)	5.4 (mean)	5.3 (mean)
Marital status	Single (N = 7) Married/Cohabiting (N = 21) Widowed (N = 2)	Single (N = 11) Married/Cohabiting (N = 17) Widowed (N = 2)
Christian religion	N = 25	N = 23
Monthly household income (in USD)	$121 (mean)	$45 (mean)
Type of healer visited	Spiritualist (N=12) Bone setter (N=10) Traditional birth attendant (N=4) Herbalist (N=4)	N/A

Participants recruited from healer practice locations were slightly older, with a higher proportion being married, and with higher reported monthly incomes, compared to the

biomedicine group. Other characteristics, including gender, household size, highest level of education, and religious affiliation, were similar between the two groups.

Qualitative Results

Overview

Our qualitative data demonstrate salient perceived advantages and disadvantages to both healthcare modalities, which motivate patient engagement with healthcare resources. We have developed three broad categories representing influences on healthcare utilization that were evident in the data. They are summarized as follows: 1) traditional healers treat patients with "care"; 2) biomedicine uses "modern" technologies; and 3) peer "testimony" influences healthcare engagement. Within each of these categories, we provide examples to illustrate how these factors drive plural healthcare engagement. We consider each one separately, below, and then present a conceptual model for how these factors interrelate to create therapeutic itineraries in southwestern Uganda.

A. *Traditional healers care about their patients*

Patients recruited from traditional healers report positive experiences with their care, specifically describing that treatments effectively relieve their symptoms. Participants state that they prefer traditional therapies because traditional practitioners "heal faster". This efficient healing is sometimes attributed to the fact that traditional practitioners spend more time personally treating and caring for their patients, compared with healthcare workers in biomedical settings:

> *Those [bonesetters] are super! They heal faster than biomedicals. When you take your patient to a bonesetter, he does not take long to get healed, compared to one in the hospital. In hospitals, the healing process is long because they do not do much more than hanging you there [in traction] and leave you. You can even become lame because they do not check to see whether you are healing or not. But for the healer, he does his reviews [checks your wound healing] constantly. (Traditional healer patient, female, 68 years old)*

Patients receiving traditional care also state that they are treated with respect when visiting healers, and that healers are motivated to care for patients, rather than being strictly economically driven. Participants reported that healers attend to patients immediately, even if they did not have money; a few participants stated that healers allowed them to pay for services rendered in installments, or in kind (through farm goods). A participant seeking care from a traditional birth attendant described her preference for traditional healing, emphasizing the kindness of her practitioner:

> *[The healer] does everything for you. Her services are excellent. In fact, when you deliver [your children] from here, you do not even think of going elsewhere another time. She cares so much about her clients. In fact, for all my pregnancies, I received antenatal care from this healer. She is my neighbor, and instead of going to sit at the hospital the whole day waiting for checkup, I come here. She is my neighbor and her services are good. So, I come get my antenatal checkup, and go back home to do my chores. (Traditional healer patient, female 35 years old)*

In contrast, patients describe experiences with biomedicine with narratives of disrespect, mistreatment, neglect or "abuse". The central message of these biomedical testimonies

is that healthcare workers do not care about their patients. In some cases, participants referred to these accounts while explaining why they tend to avoid biomedical facilities. A woman describes her experience receiving antenatal care at the local hospital:

> *I came to this hospital for antenatal care and found a nurse who treated me badly. She would tell you to lay on the bed and instead of telling you what to do, she would shout at you and say, "Don't face me! Face the other side!" in a loud voice, and you wonder what the problem was. She embarrassed me and I felt ashamed. I promised myself never to return in this hospital …. She would only shout at us. She was horrible. (Biomedical patient, female, 38 years old)*

A number of participants describe experiences at biomedical facilities where they are never attended to by biomedical staff, despite waiting for many hours – sometimes spending the entire day without receiving medical attention. These hours spent waiting come at the expense of childcare, household duties and income-generating activities. One man describes his experience seeking biomedical care for a toothache as follows:

> *I went to the referral hospital and spent there the whole day without treatment. The following morning, when I went back, I was given only Panadol [Acetaminophen]. I felt so sad. (Biomedical patient, male, 56 years old)*

Another patient states that he gave up after waiting all day for a voluntary circumcision procedure:

> *You reach there and sit for the whole day without treatment. Drugs are never there and health workers do not attend to patients as it should be. They arrive at work late and leave work early. They are really bad. I went [to the clinic] one time for circumcision and sat there for many hours until I got hungry and gave up. I left without seeing any doctor. (Traditional healer patient, male, 27 years old)*

B. *Biomedicine uses modern technologies to heal*

Participants state that biomedical care is preferred in instances where "modern" technologies can be utilized to provide a diagnosis for one's symptoms, and guide treatment. Through blood and radiological tests, healthcare providers can identify the specific cause of a patient's illness, and provide appropriate care. Patients perceive that the information generated by biomedical technology validates the therapies administered to them:

> *They use machines to diagnose and test for conditions. The give the right medical information. (Biomedical patient, male, 25).*

Having received a specific diagnosis, participants also believe that the treatment recommended by healthcare workers will be effective in alleviating their symptoms. For example, one participant described how appropriate medicines have the capacity to heal, even if taken in small amounts:

> *When you come [to the clinic] you get diagnosed and they write for you a prescription and you get the medicine then their service is good … Even if you get very little medicine from them and take it, you get healed. (Biomedical patient, female, 60 years old)*

Another patient explains why the capacity to intervene with modern biomedical technology is more effective in treating symptoms than traditional medicine:

> *Biomedical facilities are good … when you are, for instance, in a critical condition, they can put you on life support machines, or they can put you on a drip. They can also give you tablets and injections that can help you. Traditional healers can't manage something like that. They don't have modern equipment. They don't have tablets, and they don't' have drips and injections. (Traditional healer patient, male, 26 years old)*

Results from biomedical testing guide what some participants describe as "proper", effective treatment, compared with traditional healing where therapies are provided in the absence of any diagnostic testing:

> *[Biomedical facilities] diagnose you and inform you of the ailment that you are suffering from, and at times inform you that your health is okay … When you visit biomedical health facilities they diagnose you and inform you of your results and in case you are HIV positive, you can start on medicine … [Traditional healers] don't have equipment to diagnose, so how do they diagnose for conditions? … I don't trust them. (Biomedical patient, Female, 22 years old)*

While biomedicine is favored for its use of diagnostic technologies, other participants describe preference for traditional healing *specifically because* these approaches could enable avoidance of biomedical procedures, which participants describe as "unnecessary" and having high morbidity and mortality. Participants state that an advantage of traditional healing is that it supports the body to heal "naturally", rather requiring modern, invasive interventions. Participants report seeking traditional care after having been told by biomedical providers that they would require an operation in order to recover. Those who ultimately healed after receiving traditional care declared that biomedical providers rush to use modern technologies, instead of allowing the body to heal on its own. One patient describes his experience receiving care from a bonesetter, after suffering severe extremity fractures after falling from a motorcycle:

> *[The hospital staff] told me that the doctors will cut off my leg because it was badly injured and that there was no way they could fix it … When we reached [this healer], they told me that the bone that joins the knee was broken but promised that since I was in that place, in two to three weeks, I will be able to walk again. They then aligned my leg and started the treatment … I am now getting better. If I had remained at the hospital, I know my leg would have been cut off by now. (Traditional healer patient, male, 35 years old)*

Another patient describes how effective treatment from an herbalist allowed her sister to avoid a Caesarean section with her twin pregnancy:

> *These healers are very useful … my elder sister had a problem with her twin pregnancy. She was stuck with the pregnancy because the babies could not move. They took her to one of the traditional healers and was given medicine which helped her so much and she delivered her babies without difficulties. We thought she would be operated on while giving birth [via Caesarean section] because the doctors at referral hospital had told her that she will not manage to push and advised her to go for an operation, which did not happen because of*

the medicine the healer gave her. (Traditional healer patient, female, 30 years old)

Participants described fear of utilizing biomedical facilities to deliver their children, as they believed that physicians would perform unnecessary Caesarian sections, considered a high-risk procedure for both mothers and infants:

[Doctors] rush women to the operating theatre when it's not necessary. Many women and babies have lost their lives due to the negligence of doctors. Women fear to deliver from hospital. (Traditional healer patient, male, 26 years old)

C. *Peer "testimony" influences healthcare engagement*

Our participants recount social narratives, or "testimonies" which describe healthcare experiences among peers within their communities. These discursive events evaluate a provider's competence and effectiveness in addressing ailments, and describe negative or positive outcomes of treatments. Participants indicate that peer testimonies strongly influence where they choose to seek care for their symptoms. We found that biomedical narratives frequently reinforced individual reports of mistreatment; in contrast, narratives about traditional healing were generally positive and affirmed the "real" nature of this form of healthcare.

Numerous participants who received care from traditional healers describe negative peer narratives about biomedicine. A participant describes the testimony from his neighbor that influenced his decision to seek care from a traditional bonesetter:

My neighbor reached [the referral hospital after injuring his leg], but nothing much was done. They made him sit on the waiting bench and the doctor told the caretaker to go and buy a bandage and find an empty box. The doctor then dismantled the box and tied it on the leg using the bandage and left him there. He remained there until morning. …. He never got any treatment [for the leg injury] apart from the empty boxes they tied on the leg. I will never forget what he experienced from the referral hospital. It was so bad and so discouraging. Health workers do not care about patients. (Traditional healer patient, male, 57 years old)

A number of participants recalled community narratives indicating that healthcare workers would intentionally withhold treatment or harm their patients. One woman seeking care at a traditional birth attendant practice describes stories that made her fear that she would be harmed at the hands of healthcare workers:

There was a woman in labor who was supposed to be taken to the operating theatre but the nurses asked her for money, which she did not have. They refused to work on her until other patients contributed some money and gave it to the nurses … Those nurses do not mind whether you die from there or not … There is also one mother I heard about who took her child for immunization and got an argument with the nurse. Intentionally the nurse gave the child overdose and the child died. Some of these health workers are so wicked. (Traditional healer patient, female, 35 years old)

Negative peer testimonies were not limited to patients of healers. For example, one woman seeking biomedical care told a story about her neighbor suffering mistreatment at the same facility.

> *My pregnant neighbor delivered her baby in the village compound. [When they arrived at this hospital for post-partum care], the nurse abused her, saying that she should take her stupidity back to her village. They do not care. (Biomedical patient, female, 22 years old).*

In stark contrast to narratives surrounding biomedical care, peer testimony surrounding traditional healing is largely positive. Healers are lauded for their effective care, and patients are guided by peer testimonials in selecting which healer to visit for their ailments. One participant seeking care at a traditional herbalist describes the impact of peer endorsements on her decision to seek care from this particular healer:

> *This healer is popular and well known, and wherever you go, people will recommend her to treat your sick child … I have seen so many different people come here to receive treatment … I am impressed. (Traditional healer patient, male, 18 years old).*

A central concept in many testimonies about traditional medicine is the genuineness of the healer, and how they should be set apart from traditional healers who may be "fake" or "quacks". One participant describes how testimonies from peers with similar injuries directed him to seek care from a specific bonesetter, and how testimonies generate more patients for particular healers:

> *Most traditional healers are quacks, and personally I don't trust them. [Interviewer: Then how do you know that you will heal from this treatment?] I get the confidence from other people who have been treated here. There is a man from a nearby dairy. He bones were more severely broken than mine, but he healed from here, and is now doing his work. I have heard many people's testimonies that they have been healed from here … When I come here and get healed, I will direct another one because he will be healed too and that person will also direct others… A healer who is real does not need to advertise on the radios because the people they heal create market for them. (Traditional healer patient, Male, 26 years old)*

DISCUSSION

This study identified factors that drive engagement with healthcare resources in a medically pluralistic setting, and identified three central factors that contribute to therapeutic pluralism. These factors may be summarized as follows: 1) traditional healers care about their patients, while biomedical providers do not; 2) biomedical technologies can provide diagnosis and guide treatment, but these technologies are sometimes intentionally avoided; and 3) peer testimonies influence healthcare utilization, largely in favor of traditional healing. Figure 1 presents a conceptual model integrating our findings to show how influences at the healthcare provider, healthcare system, and peer levels influence individual engagement in pluralistic settings. This model is not inclusive of all variables that influence health engagement, but illustrates categories that were described by our participants in driving their own healthcare decision making, specifically regarding decisions to utilize traditional or biomedical care.

First, our data illustrate that healthcare provider characteristics are of central importance to patients. Specifically, the quality of interpersonal interactions can either motivate or deter engagement with healthcare services. In our study, patient-provider interactions with traditional healers are described as generally respectful and supportive. In contrast, patient-provider interactions in biomedical contexts included narratives of neglect and "abuse". The health effects of negative interactions with biomedical staff have been well described in cases of disengagement with HIV care among people living with HIV[33-35], decreased PrEP utilization among key populations[36] and among women giving birth[37-39]. Other researchers have similarly shown that traditional healers are favored in some cases because they provide social support within their communities, functioning as counselors, social workers, spiritual guides, and legal advisors[5,20,25,40-44].

Characteristics of the available healthcare systems impact healthcare engagement. Participants appreciate that biomedical laboratory and radiologic testing guide diagnosis and treatment, thereby gaining reassurance that they can heal from their illness through "proper" treatment. We note that the desire for healthcare directed by test results is the central factor favoring biomedical healthcare utilization among our participants. Interestingly, data from high-resource contexts has shown that diagnostic test results do not increase patient reassurance or decrease health-related anxiety in outpatient biomedical settings[45,46]. It is likely that in our medically pluralistic study site, the capacity of biomedical facilities to perform diagnostic testing is distinctive in contrast to traditional healing approaches, and therefore considered a benefit. Further, our qualitative data draws from patients' own words describing reassurance in receipt of diagnostic testing, whereby the prior studies employ quantitative measurements of patient reassurance and anxiety.

We also found that traditional healthcare is sometimes preferred as a means to avoid invasive procedures, such as orthopedic fixation, limb amputation, or Caesarean section. Our findings are congruent with prior research demonstrating avoidance of facility-based obstetric services, preference for traditional home birth[25,39,47], and bonesetters to heal orthopedic injuries in sub-Saharan Africa[48,49]. Motivation to avoid invasive operative procedures is further explained by data that show poor post-operative outcomes throughout sub-Saharan Africa[50]; for example, maternal mortality after Caesarean section is fifty times higher in Africa compared with high income countries[51]. As such, patients consider invasive biomedical procedures high risk, and seek to avoid them through receipt of traditional therapies.

Additionally, the content of peer testimonies strongly influences patients' decisions to utilize traditional or biomedical care. Peers can be defined as other adults residing in the same community as the participant, who have relevant experiences receiving biomedical care, traditional care, or both. Peer influences have been shown to have strong impact on individual healthcare engagement in the cases of HIV services utilization[52-54], adolescent health[55,56], mental health[57], and substance misuse[58], for example. Our study shows how peer testimonies serve as endorsements of traditional healing, legitimizing its use through descriptions of clinical effectiveness. In contrast, largely negative narratives regarding biomedicine potentiate avoidance of these facilities and services.

Finally, our data contribute to a growing body of work that emphasizes the important role of traditional healers within the communities they serve. Our findings illustrate why

traditional medicine may be preferred, even when biomedical services are available and accessible to patients. Lack of biomedical engagement in pluralistic settings should not simply be attributed to lack of access, but should be considered an individual's informed healthcare choice. We suggest that public health interventions specifically engage with traditional healers to increase intervention impact and community acceptability; they are well positioned allies for any community-based health program. Studies have shown that healers are interested in working with biomedical providers to improve health outcomes for their patients[59-61].

There are a few limitations of this study. It is beyond the scope of this research to investigate the effectiveness or appropriateness of therapies administered by providers to the participants in our study. Similarly, it is out of our scope to consider the ethnopharmacological and ethnobotanical literature investigating the clinical efficacy of traditional therapies, which could impact a patients' clinical improvement and assessment of effective treatment; that literature is not discussed here. Last, qualitative data are meant to be specific and contextual rather than broadly generalizable, and are useful in generating hypotheses. As such, our data suggest numerous directions for future study; for example, do the factors we identified influence patients differentially as a function of patient age, gender, socio-economic status, or other individual characteristics? Are there distinctions among healers or their clients that predict increased biomedical or traditional utilization, such as gender, specialty, symptoms, or cost? How can public health initiatives that collaborate with traditional healers be optimally delivered in medically pluralistic settings?

CONCLUSIONS

Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which can influence patients' therapeutic itineraries, and illustrate why traditional healers are sometimes preferred. Our findings provide a basis for public health interventions in medically pluralistic communities, and underscore the importance of recognizing and engaging with traditional healers as important stakeholders in community health.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the work of our research assistants, Patricia Tushemereirwe, Donny Ndazima and Doreen Nabukalu. We are grateful to the traditional healers and patients in Mbarara District for sharing their experiences with us.

CONTRIBUTORSHIP STATEMENT

RS conceived of the study. RK and JMA provided input on study design, study procedures. RS and JMA oversaw data collection. RS was primarily responsible for data analysis, with input from JMA, RK and NW. RS composed the first draft of the manuscript. All authors provided input and approve of the final submission.

COMPETING INTERESTS

The authors declare no competing interests.

FUNDING

This study was supported by the National Institutes of Health (K23 MH111409), PI: Sundararajan. RK is supported by the National Institutes of Health (R01 MH109337).

The study funder did not have any role in the study design, collection, analysis, interpretation of data, nor in the decision to submit the article for publication. All authors are independent from the funders, and had full access to all of the data. All authors take responsibility for the integrity of the data and accuracy of the data analysis.

DATA SHARING STATEMENT

Deidentified data may be shared upon reasonable request by emailing the first author.

PATIENT AND PUBLIC INVOLVEMENT STATEMENT

Patients were included as participants in this study. They did not directly participate in the design or implementation of the study, as the purpose of the study was to elicit patient perspectives on community healthcare resources. Results of this study were used to guide development of a study community advisory board, which includes patients and other stakeholders, including healthcare providers and community leaders.

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FIGURE CAPTION

Figure 1. Conceptual model showing key factors within various levels (healthcare provider, healthcare system, peer) influencing individual health behavior within medically pluralistic contexts.

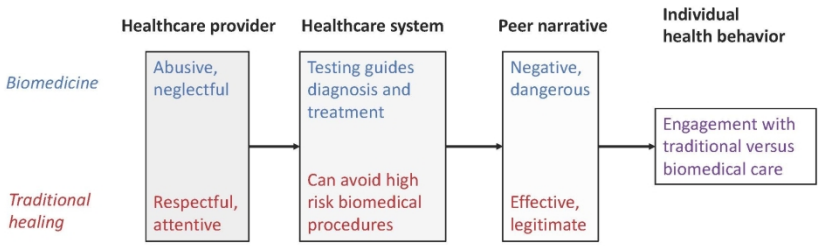

Figure 1. Conceptual model showing key factors within various levels (healthcare provider, healthcare system, peer) influencing individual health behavior within medically pluralistic contexts.

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BMJ Open

A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-033410.R1
Article Type:	Research
Date Submitted by the Author:	14-Jan-2020
Complete List of Authors:	Sundararajan, Radhika; Weill Cornell Medical College, Center for Global Health; Weill Cornell Medical College, Emergency Medicine Mwanga-Amumpaire, Juliet; Mbarara University of Science and Technology King, Rachel; UCSF Medical Center, Global Health Sciences Ware, Norma; Harvard Medical School, Global Health and Social Medicine
Primary Subject Heading:	Global health
Secondary Subject Heading:	Complementary medicine
Keywords:	COMPLEMENTARY MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, QUALITATIVE RESEARCH, PUBLIC HEALTH

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A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

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ABSTRACT

Introduction: *Medical pluralism*, or concurrent utilization of multiple therapeutic modalities, is common in various international contexts, and has been characterized as a factor contributing to poor health outcomes in low-resource settings. Traditional healers are ubiquitous providers in most regions, including the study site of southwestern Uganda. Where both informal and formal healthcare services are both available, patients do not engage with both options equally. It is not well understood why patients choose to engage with one healthcare modality over the other. The goal of this study was explain therapeutic itineraries in a sub-Saharan African context and create a conceptual framework of pluralistic health behavior.

Methods: In-depth interviews were conducted from September 2017 – February 2018 with patients seeking care at traditional healers (N=30) and at an outpatient medicine clinic (N=30) in Mbarara, Uganda; the study is nested within a longitudinal project examining HIV testing engagement among traditional healer-utilizing communities. Inclusion criteria included age ≥18 years, and ability to provide informed consent. Participants were recruited from practices representing the range of healer specialties. Following an inductive approach, interview transcripts were reviewed and coded to identify conceptual categories explaining healthcare utilization.

Results: We identified three broad categories relevant to healthcare utilization: 1) traditional healers treat patients with "care"; 2) biomedicine uses "modern" technologies; and 3) peer "testimony" influences healthcare engagement. These categories describe variables at the healthcare provider, healthcare system, and peer levels that interrelate to motivate individual engagement in pluralistic health resources.

Conclusions: Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which influence patients' therapeutic itineraries. Our findings provide a basis to improve health outcomes in medically pluralistic settings, and underscore the importance of recognizing traditional healers as important stakeholders in community health.

Keywords: Medical pluralism, Uganda, traditional healers, qualitative

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study illuminates factors that motivate engagement with healthcare resources by using data from biomedical and traditional medicine utilizers
- This study employed qualitative methods to explore participants' own experiences of healthcare modalities, and identify perceived advantages and disadvantages of each form of healing
- Participants within the traditional medicine group had nearly all previously sought biomedical care, while the biomedical group largely denied prior use of traditional medicine
- While the data gathered is highly contextual and specific to the study context, the conceptual model presented offers a broad application to other medically pluralistic communities
- Based on study findings, we suggest future approaches to healthcare initiatives, policies, and research in pluralistic settings

INTRODUCTION

Medical pluralism, or utilization of multiple therapeutic modalities, is common where both biomedical and complementary or alternative treatments are available to patients. This pattern of healthcare engagement is observed in both high-[1-3] and low-resource settings[4-6], and is well described for patients with both acute[7] and chronic illness[8-10] in various international contexts. In low- and middle-income countries, complementary and alternative healthcare services are often provided by traditional healers, who practice outside of the formal biomedical system. Traditional healers are broadly defined by the World Health Organization as: 1) persons recognized by local community as healers; 2) having regular patient attendance; and 3) having space to receive and treat patients[11,12]. They "provide health care by using plant, animal and mineral substances, and other methods based on social, cultural, and religious practices"[13,14]. It is estimated that 80% of the population in sub-Saharan Africa visit traditional healers[15].

As such, traditional healers are an initial point of contact for patients in medically pluralistic settings. Patients may prefer informal health services from traditional healers because of their increased accessibility: healers are present in higher numbers than physicians and biomedical facilities, particularly in low-resource settings[16,17]. However, their popularity cannot be strictly explained by convenience. Research in urban regions having high density of biomedical institutions demonstrates similar reliance on traditional healers[16-18]. Patients may also seek out traditional therapies to address symptoms attributed to ancestral curses or bewitching, believed incurable by biomedicine[19]. Use of traditional medicine is also strongly tied to local religious and ethnic identities[20]. Patients may pursue traditional healing in the setting of biomedicine treatment "failure", when symptoms worsen or persist despite ongoing therapies[21,22].

Prior research has shown that traditional healer use is a factor contributing to poor health outcomes among patients. For example, receiving care from a traditional healer has been shown to delay HIV testing and antiretroviral therapy (ART) initiation[23], and interrupt HIV treatment[22] for people living with HIV (PLHIV). In Mozambique, PLHIV initially seeking care from traditional healers experienced significantly longer delays to diagnosis compared with those who did not utilize healers; this delay exponentially grew with corresponding increases in the number of healers consulted prior to receiving HIV testing[23]. In South Africa, medical pluralism was shown to be negatively associated

with ART use in a cohort of PLHIV[24]. Use of traditional healers was also identified as an important variable contributing to the recent Ebola outbreak in West Africa[25]. Studies have demonstrated that medical pluralism similarly contributes to poor outcomes for non-infectious diseases, such as nonadherence to chemotherapy for cancer[26,27], or poor outpatient linkage to care for patients with hypertension[28].

Because they are frequently consulted for most types of illness, traditional healers could be important allies for public health initiatives. Some programs have attempted to engage with healers for these purposes, which have included trainings for healers to deliver counseling and facility referral for HIV[29,30], TB[31], or malaria testing[32], or to increase uptake of prenatal care[33]. However, in most cases, program effectiveness has been limited by the fact that patients may not complete referrals to facilities. These findings highly the fact that where both informal and formal healthcare services are available, patients do not engage with both options equally.

There remains a critical lack of understanding about why patients choose to utilize one healthcare resource, but not another. It is clear that biomedicine and traditional healing offer distinctive forms of healthcare for patients. But there is a dearth of knowledge on perceived advantages and disadvantages of each modality from the perspective of the healthcare user. Without this information, healthcare initiatives in pluralistic settings cannot be truly “patient-centered”, and are at risk for failure. The goal of this study was to identify factors that motivate engagement with healthcare resources, using qualitative research methods. We sought to explain therapeutic itineraries in a sub-Saharan African context by conducting interviews with users of biomedical and traditional healthcare resources. These data were used to develop a general, conceptual framework that can inform future work in medically pluralistic settings.

METHODS

Study Setting and Design

This qualitative study was conducted in Mbarara District, Uganda, a rural district of 418,000 residents located ~275 km southwest of the capital city of Kampala. Southwestern Uganda is a medically pluralistic context, where both traditional and biomedical modalities of healthcare co-exist[34-36]. In this region of sub-Saharan Africa, traditional healers practice herbalism and spiritual healing; they also set broken bones and attend births in the community. Spiritual healers attribute their powers to the *Bachwezi*, which are believed to be ancestral spirits from an ancient kingdom that previously occupied this region of eastern Africa[37,38]. In Uganda, traditional healing is not formally recognized by the Ministry of Health; there is no centralized oversight of traditional healing training programs or services. This research was conducted as part of a multi-year, mixed methods study of HIV services engagement in a medically pluralistic community.

Sampling and Recruitment

Following a purposive sampling strategy, sixty (N=60) adults were identified to participate as key informants in this study, or “individuals that are especially knowledgeable about or experienced with a phenomenon of interest”[39]. In our case, key informants were selected to represent variation in experiences of receiving modalities of healthcare: biomedical and traditional. That is, participants were patients representing two subgroups: (1) individuals receiving treatment from traditional healers (N=30), and (2) individuals receiving treatment from a biomedical general medicine

outpatient clinic (N=30). Inclusion criteria for all participants were: 1) age ≥18 years; 2) ability to provide informed consent; and 3) seeking healthcare at either a traditional healer or outpatient biomedical clinic in Mbarara District.

Both verbal and written informed consent were obtained by Ugandan research assistants (RAs) prior to enrollment. After verbally reviewing the consent form, research staff used a 5-item questionnaire to assess whether the potential participant understood the study and consent process. This questionnaire posed questions critical to demonstrating consent, such as “How much time will this take you?”; “What are the possible benefits for you?”. If a potential participant demonstrated errors in understanding, these were corrected, and potential participants asked if they needed further clarification. If, after further attempts to clarify misunderstandings, study staff determined that the potential participant did not comprehend the consent process, or critical aspects of the study, they were not enrolled.

Participants in the traditional medicine subgroup were recruited from twelve traditional healer practices which reflected the range of specialties in this region (herbalist, bone setter, traditional birth attendant, and spiritual healer). All were located within 20 kilometers of Mbarara town center. It is well established that men tend to have low uptake of in healthcare services in sub-Saharan Africa[1-3]. In order to ensure that male perspectives were represented, we recruited two-thirds of participants at healer practices who were known to provide services for men. Therefore, more bonesetter and spiritual healer patients are included in the traditional healer group. For the purposes of this study, we excluded Christian-based spiritual healers (i.e., “Born Again” or Pentecostal ministers). Participants in the biomedical subgroup were recruited from Mbarara Municipality Clinic, a general outpatient government-run clinic in the town of Mbarara, which serves approximately 50,000 patients per year. Services at this clinic are provided free of charge.

At both traditional and biomedical facilities, RAs approached patients following completion of visits to assess eligibility and interest in participation. Potential participants were individually recruited by RAs, who visited recruitment sites once per week during business hours to screen for eligible patients. Recruitment visits were scheduled on random days of the week to maximize variation of participants included in this study. A maximum of two participants was enrolled during each site visit in order to allow ample time to review informed consent and conduct minimally-structured interviews. This approach ensured interview quality, and was central to the inductive data analysis process by providing time to review interview content, provide feedback to RAs, and identify preliminary codes (see “Data Collection” and “Analysis of Data” sections for more details). Biomedical clinic leadership and traditional healers gave permission for study staff to recruit patients at their practices. Recruitment was carried out over a period of six months (September 2017 - February 2018).

A target sample size of 30 participants per subgroup was guided by prior research suggesting that a range between 20 and 30 interviews is adequate to reach *thematic saturation*, the point at which no new concepts emerge from subsequent interviews[40-42]. Two authors (RS and JMA) reviewed transcripts as they were completed and corresponded weekly to identify and discuss emerging themes. After 30 interviews per group were conducted, the authors agreed that thematic saturation had been reached, and interview content no longer contained new or surprising content.

Data Collection

Data collection for this study consisted of a single in-depth interview, conducted by Ugandan RAs trained in qualitative research methods. Interviews followed an interview guide that included the following topics: 1) details of the patient's therapeutic itinerary for his/her current symptoms; 2) symptoms that motivated him/her to seek healthcare; 3) attitudes towards, and experiences with, traditional and biomedicine; and 4) details of concurrent or recent biomedical and traditional healer visits. Interviews lasted approximately one hour and were conducted in the local language (Runyankore), in private locations at either healer practices or at the participating biomedical clinic. Participants received the equivalent of 10,000 Ugandan Shillings (UGX, ~$3 USD) in household staples (cooking oil, sugar, salt, soap) in recognition of the time and effort required to participate in the interview.

Interviews were digitally recorded, then transcribed and translated into English by the same RA who had conducted the interview. All transcripts were produced within 72 hours of the interview being completed. The transcripts were reviewed by the first author for quality, content, and to provide feedback to the RAs regarding interviewing techniques. English transcripts were spot-checked against audio recordings by an author (JMA, who is fluent in Runyankore and English) to ensure validity and integrity of translations.

Analysis of Data

A three-step, inductive approach was used to analyze the qualitative data, as follows: (1) development of codes; (2) coding; and (3) category construction. We employed an interpretive phenomenological approach to data analysis[43,44], as the goal of this study was to explore participants' own experiences and perspectives on healthcare engagement.

Development of Codes.

Following an inductive process, interview transcripts were reviewed by the first author (RS) concurrently with data collection to identify an initial set of codes, or labels that described key concepts in the dataset. The inductive strategy provided overlap between qualitative interviewing and data analysis, allowing for iterative engagement with the dataset to identify emerging concepts of interest. As additional transcripts were produced and reviewed, codes were reviewed and refined to fit the data. Using the "constant comparison" method, newly coded text segments were compared to text segments previously marked with the same code to determine if they reflected the same concept[45]. This process was repeated until all transcripts had been reviewed. A final list of codes was produced through discussion and consensus among three co-authors (RS, JMA and RK).

Coding:

All study transcripts were coded, and re-coded when necessary, using the finalized list of codes. QSR NViVo 11 (QRS International Pty Ltd) was used for coding and data organization, but not in development of codes.

Category Construction:

Next, coded data were examined and grouped to form conceptual categories, where data are aggregated based on similarities of meaning. Categories are defined below using text examples. Quotes from participants are shown as italicized and indented.

Interrelationships between categories were identified to create a conceptual framework illustrating factors that influence health behavior in a pluralistic context (Figure 1).

Ethical Statement:

This research was approved by the Human Research Protections Program Institutional Research Board at the University of California, San Diego (#170672), Weill Cornell Medical College (#1803019105), Mbarara University of Science and Technology Research Ethics Committee (#16/01-17) and the Ugandan National Council for Science and Technology (#SS4338). Participants provided written and verbal informed consent in Runyankore.

RESULTS

Characteristics of Participants

Characteristics of study participants appear in Table 1. Over half of the sample had clinical experience with both biomedical and traditional modalities of healthcare. However, pluralistic behaviors were much more commonly reported among patients of traditional healers. Only two participants recruited from the biomedical clinic reported prior experience receiving care from traditional healers (n=2/30, 7%); in contrast, all (n=30) traditional healer patients reported prior experience receiving biomedical treatment.

TABLE 1. CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristic	Traditional healer clients (N=30)	Biomedical clients (N=30)
Report previously receiving care from alternate modality	N=30 (100%)	N=2 (7%)
Age (in years)	30 (median) IQR = 20	28.5 (median) IQR = 10.75
Female gender (%)	N = 16 (53%)	N= 18 (60%)
Primary school education or less	N= 14 (47%)	N = 13 (43%)
Household size (in persons)	5 (median) IQR = 3	4.5 (median) IQR = 3.5
Marital status	Single (N = 7) Married/Cohabiting (N = 21) Widowed (N = 2)	Single (N = 11) Married/Cohabiting (N = 17) Widowed (N = 2)
Christian religion	N = 25 (83%)	N = 23 (77%)
Monthly household income (in USD)	$41 (median), IQR = 76	$22 (median) IQR = 46
Type of healer visited on day of enrollment	Spiritualist (N=12) Bonesetter (N=10) Traditional birth attendant (N=4) Herbalist (N=4)	N/A

Participants recruited from healer practice locations were slightly older, with a higher proportion being married, and with higher reported monthly incomes, compared to the biomedicine group. Biomedical participants were recruited from a government-run medical clinic, where they received health services at no cost. Therefore, we would expect lower household incomes, as they have preferentially sought to receive free medical care, rather than present to a fee-for-service facility. Other characteristics, including gender, household size, highest level of education, and religious affiliation, were similar between the two groups.

Qualitative Results

Overview

Our qualitative data indicate important perceived advantages and disadvantages to both healthcare modalities, which motivate patient engagement with available resources. We have developed three broad categories representing influences on therapeutic itineraries that were evident in the data. They are summarized as follows: 1) traditional healers

treat patients with “care”; 2) biomedicine uses “modern” technologies; and 3) peer “testimony” influences healthcare engagement. Within each of these categories, we provide examples to illustrate how these factors drive plural healthcare engagement. We consider each one separately, below, and then present a conceptual model for how these factors interrelate to create therapeutic itineraries in southwestern Uganda.

A. *Traditional healers care about their patients*

Patients recruited from traditional healers report positive experiences with their care, specifically describing that treatments effectively relieve their symptoms. Participants state that they prefer traditional therapies because traditional practitioners “heal faster”. This efficient healing is sometimes attributed to the fact that traditional practitioners spend more time personally treating and caring for their patients, compared with healthcare workers in biomedical settings:

> *Those [bonesetters] are super! They heal faster than biomedicals. When you take your patient to a bonesetter, he does not take long to get healed, compared to one in the hospital. In hospitals, the healing process is long because they do not do much more than hanging you there [in traction] and leave you. You can even become lame because they do not check to see whether you are healing or not. But for the healer, he does his reviews [checks your wound healing] constantly. (Bonesetter patient, female)*

Patients receiving traditional care also state that they are treated with respect when visiting healers, and that healers are motivated to care for patients, rather than being strictly economically driven. Participants reported that healers attend to patients immediately, even if they did not have money; a few participants stated that healers allowed them to pay for services rendered in installments, or in kind (through farm goods). A participant seeking care from a traditional birth attendant described her preference for traditional healing, emphasizing the kindness of her practitioner:

> *[The healer] does everything for you. Her services are excellent. In fact, when you deliver [your children] from here, you do not even think of going elsewhere another time. She cares so much about her clients. In fact, for all my pregnancies, I received antenatal care from this healer. She is my neighbor, and instead of going to sit at the hospital the whole day waiting for checkup, I come here. She is my neighbor and her services are good. So, I come get my antenatal checkup, and go back home to do my chores. (Traditional birth attendant patient, female)*

In contrast, patients describe experiences with biomedicine with narratives of disrespect, mistreatment, neglect or “abuse”. The central message of these biomedical testimonies is that healthcare workers do not care about their patients. In some cases, participants referred to these accounts while explaining why they tend to avoid biomedical facilities. A woman describes her experience receiving antenatal care at the local hospital:

> *I came to this hospital for antenatal care and found a nurse who treated me badly. She would tell you to lay on the bed and instead of telling you what to do, she would shout at you and say, “Don’t face me! Face the other side!” in a loud voice, and you wonder what the problem was. She embarrassed me and I felt ashamed. I promised myself never to return in this hospital …. She would only shout at us. She was horrible. (Biomedical patient, female)*

A number of participants describe experiences at biomedical facilities where they are never attended to by biomedical staff, despite waiting for many hours – sometimes spending the entire day without receiving medical attention. These hours spent waiting come at the expense of childcare, household duties and income-generating activities. One man describes his experience seeking biomedical care for a toothache as follows:

> *I went to the referral hospital and spent there the whole day without treatment. The following morning, when I went back, I was given only Panadol [Acetaminophen]. I felt so sad. (Biomedical patient, male)*

Another patient states that he gave up after waiting all day for a voluntary circumcision procedure:

> *You reach there and sit for the whole day without treatment. Drugs are never there and health workers do not attend to patients as it should be. They arrive at work late and leave work early. They are really bad. I went [to the clinic] one time for circumcision and sat there for many hours until I got hungry and gave up. I left without seeing any doctor. (Bonesetter patient, male)*

B. *Biomedicine uses modern technologies to heal*

Participants state that biomedical care is preferred in instances where "modern" technologies can be utilized to provide a diagnosis for one's symptoms, and guide treatment. Through blood and radiological tests, healthcare providers can identify the specific cause of a patient's illness, and provide appropriate care. Patients perceive that the information generated by biomedical technology validates the therapies administered to them:

> *They use machines to diagnose and test for conditions. The give the right medical information. (Biomedical patient, male).*

Having received a specific diagnosis, participants also believe that the treatment recommended by healthcare workers will be effective in alleviating their symptoms. For example, one participant described how appropriate medicines have the capacity to heal, even if taken in small amounts:

> *When you come [to the clinic] you get diagnosed and they write for you a prescription and you get the medicine then their service is good … Even if you get very little medicine from them and take it, you get healed. (Biomedical patient, female)*

Another patient explains why the capacity to intervene with modern biomedical technology is more effective in treating symptoms than traditional medicine:

> *Biomedical facilities are good … when you are, for instance, in a critical condition, they can put you on life support machines, or they can put you on a drip. They can also give you tablets and injections that can help you. Traditional healers can't manage something like that. They don't have modern equipment. They don't have tablets, and they don't have drips and injections. (Bonesetter patient, male)*

Results from biomedical testing guide what some participants describe as “proper”, effective treatment, compared with traditional healing where therapies are provided in the absence of any diagnostic testing:

> *[Biomedical facilities] diagnose you and inform you of the ailment that you are suffering from, and at times inform you that your health is okay … When you visit biomedical health facilities they diagnose you and inform you of your results and in case you are HIV positive, you can start on medicine … [Traditional healers] don’t have equipment to diagnose, so how do they diagnose for conditions? … I don’t trust them. (Biomedical patient, Female)*

While biomedicine is favored for its use of diagnostic technologies, other participants describe preference for traditional healing *specifically because* these approaches could enable avoidance of biomedical procedures, which participants describe as “unnecessary” and having high morbidity and mortality. Participants state that an advantage of traditional healing is that it supports the body to heal “naturally”, rather requiring modern, invasive interventions. Participants report seeking traditional care after having been told by biomedical providers that they would require an operation in order to recover. Those who ultimately healed after receiving traditional care declared that biomedical providers rush to use modern technologies, instead of allowing the body to heal on its own. One patient describes his experience receiving care from a bonesetter, after suffering severe extremity fractures after falling from a motorcycle:

> *[The hospital staff] told me that the doctors will cut off my leg because it was badly injured and that there was no way they could fix it … When we reached [this healer], they told me that the bone that joins the knee was broken but promised that since I was in that place, in two to three weeks, I will be able to walk again. They then aligned my leg and started the treatment … I am now getting better. If I had remained at the hospital, I know my leg would have been cut off by now. (Bonesetter patient, male)*

Another patient describes how effective treatment from an herbalist allowed her sister to avoid a Caesarean section with her twin pregnancy:

> *These healers are very useful … my elder sister had a problem with her twin pregnancy. She was stuck with the pregnancy because the babies could not move. They took her to one of the traditional healers and was given medicine which helped her so much and she delivered her babies without difficulties. We thought she would be operated on while giving birth [via Caesarean section] because the doctors at referral hospital had told her that she will not manage to push and advised her to go for an operation, which did not happen because of the medicine the healer gave her. (Spiritual healer patient, female)*

Participants described fear of utilizing biomedical facilities to deliver their children, as they believed that physicians would perform unnecessary Caesarian sections, considered a high-risk procedure for both mothers and infants:

> *[Doctors] rush women to the operating theatre when it’s not necessary. Many women and babies have lost their lives due to the negligence of doctors. Women fear to deliver from hospital. (Spiritual healer patient, male)*

C. Peer "testimony" influences healthcare engagement

Our participants recount social narratives, or "testimonies" which describe healthcare experiences among peers within their communities. These discursive events evaluate a provider's competence and effectiveness in addressing ailments, and describe negative or positive outcomes of treatments. Participants indicate that peer testimonies strongly influence where they choose to seek care for their symptoms. We found that biomedical narratives frequently reinforced individual reports of mistreatment; in contrast, narratives about traditional healing were generally positive and affirmed the "real" nature of this form of healthcare.

Numerous participants who received care from traditional healers describe negative peer narratives about biomedicine. A participant describes the testimony from his neighbor that influenced his decision to seek care from a traditional bonesetter:

> *My neighbor reached [the referral hospital after injuring his leg], but nothing much was done. They made him sit on the waiting bench and the doctor told the caretaker to go and buy a bandage and find an empty box. The doctor then dismantled the box and tied it on the leg using the bandage and left him there. He remained there until morning. …. He never got any treatment [for the leg injury] apart from the empty boxes they tied on the leg. I will never forget what he experienced from the referral hospital. It was so bad and so discouraging. Health workers do not care about patients. (Bonesetter patient, male)*

A number of participants recalled community narratives indicating that healthcare workers would intentionally withhold treatment or harm their patients. One woman seeking care at a traditional birth attendant practice describes stories that made her fear that she would be harmed at the hands of healthcare workers:

> *There was a woman in labor who was supposed to be taken to the operating theatre but the nurses asked her for money, which she did not have. They refused to work on her until other patients contributed some money and gave it to the nurses … Those nurses do not mind whether you die from there or not … There is also one mother I heard about who took her child for immunization and got an argument with the nurse. Intentionally the nurse gave the child overdose and the child died. Some of these health workers are so wicked. (Herbalist patient, female)*

Negative peer testimonies were not limited to patients of healers. For example, one woman seeking biomedical care told a story about her neighbor suffering mistreatment at the same facility.

> *My pregnant neighbor delivered her baby in the village compound. [When they arrived at this hospital for post-partum care], the nurse abused her, saying that she should take her stupidity back to her village. They do not care. (Biomedical patient, female).*

In stark contrast to narratives surrounding biomedical care, peer testimony surrounding traditional healing is largely positive. Healers are lauded for their effective care, and patients are guided by peer testimonials in selecting which healer to visit for their ailments. One participant seeking care at a traditional herbalist describes the impact of peer endorsements on her decision to seek care from this particular healer:

> *This healer is popular and well known, and wherever you go, people will recommend her to treat your sick child … I have seen so many different people come here to receive treatment … I am impressed. (Spiritual healer patient, male).*

A central concept in many testimonies about traditional medicine is the genuineness of the healer, and how they should be set apart from traditional healers who may be "fake" or "quacks". One participant describes how testimonies from peers with similar injuries directed him to seek care from a specific bonesetter, and how testimonies generate more patients for particular healers:

> *Most traditional healers are quacks, and personally I don't trust them. [Interviewer: Then how do you know that you will heal from this treatment?] I get the confidence from other people who have been treated here. There is a man from a nearby dairy. He bones were more severely broken than mine, but he healed from here, and is now doing his work. I have heard many people's testimonies that they have been healed from here … When I come here and get healed, I will direct another one because he will be healed too and that person will also direct others… A healer who is real does not need to advertise on the radios because the people they heal create market for them. (Bonesetter patient, male)*

D. Conceptual Model

Figure 1 presents a conceptual model integrating our findings to show how influences at the healthcare provider, healthcare system, and peer levels influence individual engagement with healthcare in pluralistic settings. These variables interact to shape an individual's therapeutic itinerary, but not necessarily in a stepwise manner. For healthcare users, one or more characteristics of a healthcare system may be of paramount importance in determining use of this resource, but each modality comes with potential disadvantages. Negative experiences could prompt users to switch to the alternate modality. We heard this process described by participants who believed their ailments were initially mismanaged by biomedical providers, and were subsequently healed using traditional approaches. Similarly, positive experiences contribute towards continued use of a healthcare modality, and an individual may become reticent to engage with the alternative in light of continued positive health outcomes.

DISCUSSION

This study identified variables that drive engagement with healthcare resources in a medically pluralistic setting, and identified three central factors that contribute to therapeutic pluralism. These may be summarized as follows: 1) traditional healers care about their patients, while biomedical providers do not; 2) biomedical technologies can provide diagnosis and guide treatment, but these technologies are sometimes intentionally avoided; and 3) peer testimonies influence healthcare utilization, largely in favor of traditional healing. These can be considered conceptually as factors operating at the healthcare provider, healthcare system, and peer levels (Figure 1).

Our work illustrates how healthcare provider characteristics are of central importance to patients. The quality of interpersonal interactions can either motivate or deter engagement with healthcare services. We found that patient-provider interactions with traditional healers are described as generally respectful and supportive, while patient-

provider interactions in biomedical contexts included narratives of neglect and “abuse”. These findings align prior work showing that initial choice of therapeutic modality in pluralistic contexts is driven by perceived trustworthiness of a healthcare provider[22,46-49]. Our participant accounts of negative interactions with biomedical staff are congruent with prior work linking negative interactions with disengagement with HIV care among people living with HIV[4-6], decreased HIV pre-exposure prophylaxis (PrEP) utilization among key populations[7] and lack of healthcare facility use among pregnant women[8-10].

We also describe how some characteristics of the available healthcare systems impact healthcare engagement. Our results speak to the hegemony of biomedicine in Uganda, and more broadly throughout post-colonial sub-Saharan Africa, where biomedicine is highly valued, and may be considered of superior quality and efficacy compared with traditional healing[11,12]. Some participants report gaining reassurance through laboratory and radiologic testing to guide diagnosis and therapy, describing this as “proper” treatment. We note that the desire for healthcare directed by “modern” test results is the central factor favoring biomedical healthcare utilization among our participants. Interestingly, other data from high-resource contexts has shown that diagnostic test results do not increase patient reassurance or decrease health-related anxiety in outpatient biomedical settings[50,51]. However, in our medically pluralistic study site, the capacity of biomedical facilities to perform diagnostic testing is distinctive in contrast to traditional medicine approaches, and therefore some patients consider access to testing as a benefit.

Traditional healthcare is sometimes preferred as a means to avoid invasive procedures, such as orthopedic fixation, limb amputation, or Caesarean section. Our findings are congruent with prior research demonstrating avoidance of facility-based obstetric services, preference for traditional home birth[10,36,52], and bonesetters to heal orthopedic injuries in sub-Saharan Africa[53,54]. Motivation to avoid invasive operative procedures is further explained by poor post-operative outcomes throughout sub-Saharan Africa[55]. For example, maternal mortality after Caesarean section is fifty times higher in Africa compared with high income countries[56]. As such, patients consider invasive biomedical procedures high risk, and seek to avoid them through receipt of traditional therapies.

Additionally, we note that the content of peer testimonies strongly influences patients’ decisions to utilize traditional or biomedical care. Peer influences have been shown to have strong impact on individual healthcare engagement in the cases of HIV services utilization[57-59], adolescent health[60,61], mental health[62], and substance misuse[63], for example. Our study shows how peer testimonies serve as endorsements of traditional healing, legitimizing its use through descriptions of clinical effectiveness. In contrast, largely negative narratives regarding biomedicine potentiate avoidance of these facilities and services.

Our findings provide insight on how patients decide to engage with particular healthcare resources, and can guide efforts to improve healthcare quality and interventions in medically pluralistic communities. Importantly, our conceptual model can direct strategies to engage those who may avoid biomedical resources, and have low uptake of conventional healthcare outreach program, which are frequently facility-based, and/or delivered by biomedical providers. Our data suggest that healthcare users value the interpersonal interactions and trustworthiness of healers, but also may gain reassurance

through receipt of biomedical testing and diagnostic technologies. An ideal health resource in a pluralistic context would potentially incorporate all of these valuable attributes. Traditional healers in Ghana have taken this approach, utilizing components of biomedical knowledge through reference to medical textbooks and "Google" [64]. Similarly, we know of healers in Mbarara District who use glucometers, blood pressure cuffs, and performed commercially available rapid diagnostics tests for HIV and malaria. Our data suggest that decentralized healthcare services would be highly acceptable among pluralistic communities. An example of his approach at the national health policy level is demonstrated in the case of "differentiated care" for PLHIV[20], where service delivery is tailored to the needs of PLHIV in their communities, and biomedical facility visits are minimized.

Finally, our data contribute to a body of work that emphasizes the important role of traditional healers within the communities they serve. We hope our findings explain the persistent appeal of traditional medicine, and demonstrate that pluralistic behavior should be considered more than 'an inconvenient truth' for biomedical providers, researchers and policy makers. Low biomedical engagement in pluralistic settings should not simply be attributed to lack of access to formal resources, but should be considered an individual's informed healthcare choice. We recommend that researchers and policy makers involve traditional healers when designing and implementing community-based health initiatives because healers are well positioned allies for healthcare programs. Community members may consider healers more trustworthy than biomedical providers[49]. Biomedicine could learn a great deal from healers regarding the power of interpersonal relationships as part of the healthcare process[13,14]. For example, Moshabela et. al. (2016) considered the roles of traditional healers in the context of a community-wide HIV testing and treatment intervention. They found that healers boosted impact and acceptability of the intervention through educating clients on HIV-related stigma and supporting linkage to HIV care[19].

Many studies have shown that healers are interested in working with biomedical providers to improve health outcomes for their patients[29,65,66]. However, the converse is not typically the case. Biomedical objections to traditional healing largely focus on use of alternatively explanatory mechanisms (such as belief that evil spirits or bad luck may cause physical symptoms), lack of standardized training and oversight of practices, and delivery of varying concentrations or mixtures of herbal therapies[15]. In fact, negative attitudes towards traditional medicine have been described as the primary barrier to true collaboration between traditional and biomedicine, as biomedical providers repeatedly downplay the skills and contributions of traditional healers[16,17]. Biomedical providers may express distrust and disapproval of traditional medicine in interactions with their patients[16-18]. Related to this lack of trust is the observation that our participant groups reported markedly different experiences with pluralistic healthcare utilization. Most biomedical participants denied prior use of traditional medicine, while most traditional medicine users reported having previously sought biomedical care. This difference in self-reporting is likely an example of a well described phenomenon, where patients are reticent to disclose traditional medicine use in the context of receiving biomedical care[18,67,68]. Therefore, we suspect that participants seeking care in the biomedical context under-reported traditional medicine use due to fear of social judgement.

There are a few limitations of this study. We acknowledge that baseline characteristics of participants recruited from traditional healer practices are different than those recruited

from an outpatient biomedical practice. Qualitative samples are intended to be relevant to the research question, and may not be representative, as would be prioritized in a quantitative study. We did not record medical histories for our participants, and cannot speak to how particular diagnoses may motivate to healthcare itinerary, beyond the symptoms prompting the current visit. This study includes only people seeking healthcare from traditional healers, and similar work is needed for those seeking care from faith healers. Further, we acknowledge the potential impact of social judgement and recognize that some biomedical participants may have been reticent to share positive feelings about traditional medicine during their interviews. Last, our qualitative data indicate multiple directions for future research. For example, what are strategies to facilitate bidirectional cooperation between traditional and biomedical systems? How would one design and implement a decentralized healthcare initiative in cooperation with traditional healers?

CONCLUSIONS

Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which can influence patients' therapeutic itineraries, and illustrate why traditional medicine is sometimes preferred. Our findings can inform community-based, public health interventions in medically pluralistic contexts, and underscore the importance of recognizing and engaging with traditional healers as important stakeholders in community health.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the work of our research assistants, Patricia Tushemereirwe, Donny Ndazima and Doreen Nabukalu. We are grateful to the traditional healers and patients in Mbarara District for sharing their experiences with us.

CONTRIBUTORSHIP STATEMENT

RS conceived of the study. RK and JMA provided input on study design, study procedures. RS and JMA oversaw data collection. RS was primarily responsible for data analysis, with input from JMA, RK and NW. RS composed the first draft of the manuscript. All authors provided input and approve of the final submission.

COMPETING INTERESTS

The authors declare no competing interests.

FUNDING

This study was supported by the National Institutes of Health (K23 MH111409), PI: Sundararajan. RK is supported by the National Institutes of Health (R01 MH109337). The study funder did not have any role in the study design, collection, analysis, interpretation of data, nor in the decision to submit the article for publication. All authors are independent from the funders, and had full access to all of the data. All authors take responsibility for the integrity of the data and accuracy of the data analysis.

DATA SHARING STATEMENT

Deidentified data may be shared upon reasonable request by emailing the first author.

PATIENT AND PUBLIC INVOLVEMENT STATEMENT

Patients were included as participants in this study. They did not directly participate in the design or implementation of the study, as the purpose of the study was to elicit

patient perspectives on community healthcare resources. Results of this study were used to guide development of a study community advisory board, which includes patients and other stakeholders, including healthcare providers, traditional healers and community leaders.

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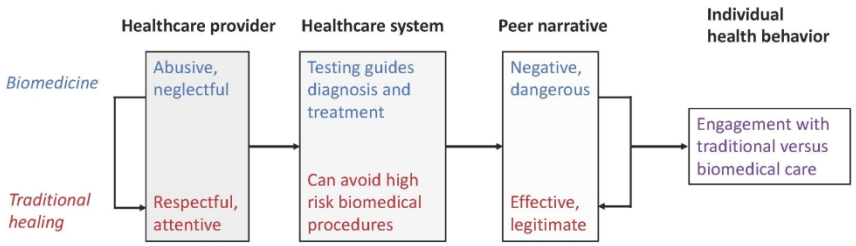
FIGURE CAPTION

Figure 1. Conceptual model showing key factors within various levels (healthcare provider, healthcare system, peer) influencing individual health behavior within medically pluralistic contexts. Each factor differentially influences an individual's therapeutic itinerary. Negative factors may motivate a switch to the other modality, and positive factors contribute towards continued use of a particular healthcare modality. This model is not inclusive of all variables that influence health engagement, but illustrates categories that were described by our participants in driving their healthcare decision making, specifically regarding decisions to utilize traditional or biomedical care.



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338x190mm (200 x 200 DPI)

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	3-4
Purpose or research question - Purpose of the study and specific objectives or questions	4
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	6
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	6
Context - Setting/site and salient contextual factors; rationale**	4-5
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	4-6
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	7
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	5-6
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-7
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-7
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	6

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-12
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-12

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	15

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	16
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	16

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

BMJ Open

A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-033410.R2
Article Type:	Research
Date Submitted by the Author:	24-Feb-2020
Complete List of Authors:	Sundararajan, Radhika; Weill Cornell Medical College, Center for Global Health; Weill Cornell Medical College, Emergency Medicine Mwanga-Amumpaire, Juliet; Mbarara University of Science and Technology King, Rachel; UCSF Medical Center, Global Health Sciences Ware, Norma; Harvard Medical School, Global Health and Social Medicine
Primary Subject Heading:	Global health
Secondary Subject Heading:	Complementary medicine
Keywords:	COMPLEMENTARY MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, QUALITATIVE RESEARCH, PUBLIC HEALTH

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A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

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ABSTRACT

Introduction: *Medical pluralism*, or concurrent utilization of multiple therapeutic modalities, is common in various international contexts, and has been characterized as a factor contributing to poor health outcomes in low-resource settings. Traditional healers are ubiquitous providers in most regions, including the study site of southwestern Uganda. Where both informal and formal healthcare services are both available, patients do not engage with both options equally. It is not well understood why patients choose to engage with one healthcare modality over the other. The goal of this study was to explain therapeutic itineraries and create a conceptual framework of pluralistic health behavior.

Methods: In-depth interviews were conducted from September 2017 – February 2018 with patients seeking care at traditional healers (N=30) and at an outpatient medicine clinic (N=30) in Mbarara, Uganda; the study is nested within a longitudinal project examining HIV testing engagement among traditional healer-utilizing communities. Inclusion criteria included age ≥18 years, and ability to provide informed consent. Participants were recruited from practices representing the range of healer specialties. Following an inductive approach, interview transcripts were reviewed and coded to identify conceptual categories explaining healthcare utilization.

Results: We identified three broad categories relevant to healthcare utilization: 1) traditional healers treat patients with "care"; 2) biomedicine uses "modern" technologies; and 3) peer "testimony" influences healthcare engagement. These categories describe variables at the healthcare provider, healthcare system, and peer levels that interrelate to motivate individual engagement in pluralistic health resources.

Conclusions: Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which influence patients' therapeutic itineraries. Our findings provide a basis to improve health outcomes in medically pluralistic settings, and underscore the importance of recognizing traditional healers as important stakeholders in community health.

Keywords: Medical pluralism, Uganda, traditional healers, qualitative

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study illuminates factors that motivate engagement with healthcare resources by using data from biomedical and traditional medicine utilizers
- This study employed qualitative methods to explore participants' own experiences of healthcare modalities, and identify perceived advantages and disadvantages of each form of healing
- While the data gathered is highly contextual and specific to the study context, the conceptual model presented offers a broad application to other medically pluralistic communities
- This conceptual model could be used to guide healthcare initiatives, policies, and research in pluralistic settings

INTRODUCTION

Medical pluralism, or utilization of multiple therapeutic modalities, is common where both biomedical and complementary or alternative treatments are available to patients. This pattern of healthcare engagement is observed in both high-[1-3] and low-resource settings[4-6], and is well described for patients with both acute[7] and chronic illness[8-10] in various international contexts. In low- and middle-income countries, complementary and alternative healthcare services are often provided by traditional healers, who practice outside of the formal biomedical system. Traditional healers are broadly defined by the World Health Organization as: 1) persons recognized by local community as healers; 2) having regular patient attendance; and 3) having space to receive and treat patients[11,12]. They "provide health care by using plant, animal and mineral substances, and other methods based on social, cultural, and religious practices"[13,14]. It is estimated that 80% of the population in sub-Saharan Africa visit traditional healers[15].

As such, traditional healers are an initial point of contact for patients in medically pluralistic settings. Patients may prefer informal health services from traditional healers because of their increased accessibility: healers are present in higher numbers than physicians and biomedical facilities, particularly in low-resource settings[16,17]. However, their popularity cannot be strictly explained by convenience. Research in urban regions having high density of biomedical institutions demonstrates similar reliance on traditional healers[16-18]. Patients may also seek out traditional therapies to address symptoms attributed to ancestral curses or bewitching, believed incurable by biomedicine[19]. Use of traditional medicine is also strongly tied to local religious and ethnic identities[20]. Patients may pursue traditional healing in the setting of biomedicine treatment "failure", when symptoms worsen or persist despite ongoing therapies[21,22].

Prior research has shown that traditional healer use is a factor contributing to poor health outcomes among patients. For example, receiving care from a traditional healer has been shown to delay HIV testing and antiretroviral therapy (ART) initiation[23], and interrupt HIV treatment[22] for people living with HIV (PLHIV). In Mozambique, PLHIV initially seeking care from traditional healers experienced significantly longer delays to diagnosis compared with those who did not utilize healers; this delay exponentially grew with corresponding increases in the number of healers consulted prior to receiving HIV testing[23]. In South Africa, medical pluralism was shown to be negatively associated with ART use in a cohort of PLHIV[24]. Use of traditional healers was also identified as an important variable contributing to the recent Ebola outbreak in West Africa[25]. Studies have demonstrated that medical pluralism similarly contributes to poor outcomes

for non-infectious diseases, such as nonadherence to chemotherapy for cancer[26,27], or poor outpatient linkage to care for patients with hypertension[28].

Because they are frequently consulted for most types of illness, traditional healers could be important allies for public health initiatives. Some programs have attempted to engage with healers for these purposes, which have included trainings for healers to deliver counseling and facility referral for HIV[29,30], TB[31], or malaria testing[32], or to increase uptake of prenatal care[33]. However, in most cases, program effectiveness has been limited by the fact that patients may not complete referrals to facilities. These findings highly the fact that where both informal and formal healthcare services are available, patients do not engage with both options equally.

There remains a critical lack of understanding about why patients choose to utilize one healthcare resource, but not another. It is clear that biomedicine and traditional healing offer distinctive forms of healthcare for patients. But there is a dearth of knowledge on perceived advantages and disadvantages of each modality from the perspective of the healthcare user. Without this information, healthcare initiatives in pluralistic settings cannot be truly "patient-centered", and are at risk for failure. The goal of this study was to identify factors that motivate engagement with healthcare resources, using qualitative research methods. We sought to explain therapeutic itineraries by conducting interviews with users of biomedical and traditional healthcare resources. These data were used to develop a general, conceptual framework that can inform future work in medically pluralistic settings.

METHODS

Study Setting and Design

This qualitative study was conducted in Mbarara District, Uganda, a rural district of 418,000 residents located ~275 km southwest of the capital city of Kampala. Southwestern Uganda is a medically pluralistic context, where both traditional and biomedical modalities of healthcare co-exist[34-36]. In this region of sub-Saharan Africa, traditional healers practice herbalism and spiritual healing; they also set broken bones and attend births in the community. Spiritual healers attribute their powers to the *Bachwezi*, which are believed to be ancestral spirits from an ancient kingdom that previously occupied this region of eastern Africa[37,38]. In Uganda, traditional healing is not formally recognized by the Ministry of Health; there is no centralized oversight of traditional healing training programs or services. This research was conducted as part of a multi-year, mixed methods study of HIV services engagement in a medically pluralistic community.

Sampling and Recruitment

Following a purposive sampling strategy, sixty (N=60) adults were identified to participate as key informants in this study, or "individuals that are especially knowledgeable about or experienced with a phenomenon of interest"[39]. In our case, key informants were selected to represent variation in experiences of receiving modalities of healthcare: biomedical and traditional. That is, participants were patients representing two subgroups: (1) individuals receiving treatment from traditional healers (N=30), and (2) individuals receiving treatment from a biomedical general medicine outpatient clinic (N=30). Inclusion criteria for all participants were: 1) age ≥18 years; 2) ability to provide informed consent; and 3) seeking healthcare at either a traditional healer or outpatient biomedical clinic in Mbarara District.

Both verbal and written informed consent were obtained by Ugandan research assistants (RAs) prior to enrollment. After verbally reviewing the consent form, research staff used a 5-item questionnaire to assess whether the potential participant understood the study and consent process. This questionnaire posed questions critical to demonstrating consent, such as “How much time will this take you?”; “What are the possible benefits for you?”. If a potential participant demonstrated errors in understanding, these were corrected, and potential participants asked if they needed further clarification. If, after further attempts to clarify misunderstandings, study staff determined that the potential participant did not comprehend the consent process, or critical aspects of the study, they were not enrolled.

Participants in the traditional medicine subgroup were recruited from twelve traditional healer practices which reflected the range of specialties in this region (herbalist, bone setter, traditional birth attendant, and spiritual healer). All were located within 20 kilometers of Mbarara town center. It is well established that men tend to have low uptake of in healthcare services in sub-Saharan Africa[1-3]. In order to ensure that male perspectives were represented, we recruited two-thirds of participants at healer practices who were known to provide services for men. Therefore, more bonesetter and spiritual healer patients are included in the traditional healer group. For the purposes of this study, we excluded Christian-based spiritual healers (i.e., “Born Again” or Pentecostal ministers). Participants in the biomedical subgroup were recruited from Mbarara Municipality Clinic, a general outpatient government-run clinic in the town of Mbarara, which serves approximately 50,000 patients per year. Services at this clinic are provided free of charge.

At both traditional and biomedical facilities, RAs approached patients following completion of visits to assess eligibility and interest in participation. Potential participants were individually recruited by RAs, who visited recruitment sites once per week during business hours to screen for eligible patients. Recruitment visits were scheduled on random days of the week to maximize variation of participants included in this study. A maximum of two participants was enrolled during each site visit in order to allow ample time to review informed consent and conduct minimally-structured interviews. This approach ensured interview quality, and was central to the inductive data analysis process by providing time to review interview content, provide feedback to RAs, and identify preliminary codes (see “Data Collection” and “Analysis of Data” sections for more details). Biomedical clinic leadership and traditional healers gave permission for study staff to recruit patients at their practices. Recruitment was carried out over a period of six months (September 2017 - February 2018).

A target sample size of 30 participants per subgroup was guided by prior research suggesting that a range between 20 and 30 interviews is adequate to reach *thematic saturation*, the point at which no new concepts emerge from subsequent interviews[40-42]. After 30 interviews per group were conducted, the study authors agreed that thematic saturation had been reached, and interview content no longer contained new or surprising content.

Data Collection

Three Ugandan Research Assistants (RAs) with prior experience in conducting qualitative interviews in southwestern Uganda collected data for this study. Prior to initiation of data collection, all RAs took part in a three-day training session led by RS

and JMA, which focused on the principles of qualitative research, approaches to conducting high quality interviews, and establishing standard procedures for interview translation and transcription. In addition, the RAs underwent intensive training with interview guide questions to ensure consistency of delivery and use throughout the study.

Each study participant took part in a single, individual, in-depth interview with one of these RAs. Interviews were conducted following an interview guide that included the following topics: 1) details of the patient's therapeutic itinerary for his/her current symptoms; 2) symptoms that motivated him/her to seek healthcare; 3) attitudes towards, and experiences with, traditional and biomedicine; and 4) details of concurrent or recent biomedical and traditional healer visits. The interview guide was created in English, translated to the local language (Runyankore), and back-translated into English to verify preservation of meaning. In addition, the interview guide was piloted with three traditional healers prior to initiation of data collection in August 2017; these responses were not included in our analysis.

Interviews lasted approximately one hour and were conducted in the local language (Runyankore), in private locations at either healer practices or at the participating biomedical clinic. Participants received the equivalent of 10,000 Ugandan Shillings (UGX, ~$3 USD) in household staples (cooking oil, sugar, salt, soap) in recognition of the time and effort required to participate in the interview.

Interviews were digitally recorded, then transcribed and translated into English by the same RA who had conducted the interview. All transcripts were produced within 72 hours of the interview being completed. The transcripts were reviewed by the first author for quality, content, and to provide feedback to the RAs regarding interviewing techniques. This monitoring process allowed for RAs to receive consistent feedback to improve interviewing skills to ensure that interviews were of high quality, explored participants unique experiences, and facilitated consistency on interview guide topics across interviewers. English transcripts were spot-checked against audio recordings by an author (JMA, who is fluent in Runyankore and English) to ensure validity and integrity of translations.

Analysis of Data

A three-step, inductive approach was used to analyze the qualitative data, as follows: (1) development of codes; (2) coding; and (3) category construction. We employed an interpretive phenomenological approach to data analysis[43,44], as the goal of this study was to explore participants' own experiences and perspectives on healthcare engagement.

Development of Codes.

Two authors (RS and JMA) reviewed transcripts within 72 hours of completion and corresponded weekly to identify and discuss emerging concepts. Guided by these discussions, the first author (RS) produced an initial set of codes, or labels that described key concepts in the dataset. Using an inductive strategy, this process was conducted while interviews were ongoing, providing overlap between qualitative interviewing and data analysis, allowing for iterative engagement with the dataset to identify concepts of interest. As additional transcripts were produced and reviewed, codes were reviewed and refined to fit the data. Using the "constant comparison" method, newly coded text segments were compared to text segments previously marked

with the same code to determine if they reflected the same concept[45]. This process was repeated until all transcripts had been reviewed. A final list of codes was produced through discussion and consensus among three co-authors (RS, JMA and RK).

Coding:

All study transcripts were coded, and re-coded when necessary, using the finalized list of codes. QSR NViVo 11 (QRS International Pty Ltd) was used for coding and data organization, but not in development of codes.

Category Construction:

Next, coded data were examined and grouped to form conceptual categories, where data are aggregated based on similarities of meaning. Categories are defined below using text examples. Quotes from participants are shown as italicized and indented. Interrelationships between categories were identified to create a conceptual framework illustrating factors that influence health behavior in a pluralistic context (Figure 1).

Ethical Statement:

This research was approved by the Human Research Protections Program Institutional Research Board at the University of California, San Diego (#170672), Weill Cornell Medical College (#1803019105), Mbarara University of Science and Technology Research Ethics Committee (#16/01-17) and the Ugandan National Council for Science and Technology (#SS4338). Participants provided written and verbal informed consent in Runyankore.

RESULTS

Characteristics of Participants

TABLE 1. CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristic	Traditional healer clients (N=30)	Biomedical clients (N=30)
Report previously receiving care from alternate modality	N=30 (100%)	N=2 (7%)
Age (in years)	30 (median) IQR = 20	28.5 (median) IQR = 10.75
Female gender (%)	N = 16 (53%)	N= 18 (60%)
Primary school education or less	N= 14 (47%)	N = 13 (43%)
Household size (in persons)	5 (median) IQR = 3	4.5 (median) IQR = 3.5
Marital status	Single (N = 7) Married/Cohabiting (N = 21) Widowed (N = 2)	Single (N = 11) Married/Cohabiting (N = 17) Widowed (N = 2)
Christian religion	N = 25 (83%)	N = 23 (77%)
Monthly household income (in USD)	$41 (median), IQR = 76	$22 (median) IQR = 46
Type of healer visited on day of enrollment	Spiritualist (N=12) Bonesetter (N=10) Traditional birth attendant (N=4) Herbalist (N=4)	N/A

Characteristics of study participants appear in Table 1. Over half of the sample had clinical experience with both biomedical and traditional modalities of healthcare. However, pluralistic behaviors were much more commonly reported among patients of traditional healers. Only two participants recruited from the biomedical clinic reported prior experience receiving care from traditional healers (n=2/30, 7%); in contrast, all (n=30) traditional healer patients reported prior experience receiving biomedical treatment.

Participants recruited from healer practice locations were slightly older, with a higher proportion being married, and with higher reported monthly incomes, compared to the

biomedicine group. Biomedical participants were recruited from a government-run medical clinic, where they received health services at no cost. Therefore, we would expect lower household incomes, as they have preferentially sought to receive free medical care, rather than present to a fee-for-service facility. Other characteristics, including gender, household size, highest level of education, and religious affiliation, were similar between the two groups.

Qualitative Results

Overview

Our qualitative data indicate important perceived advantages and disadvantages to both healthcare modalities, which motivate patient engagement with available resources. We have developed three broad categories representing influences on therapeutic itineraries that were evident in the data. They are summarized as follows: 1) traditional healers treat patients with “care”; 2) biomedicine uses “modern” technologies; and 3) peer “testimony” influences healthcare engagement. Within each of these categories, we provide examples to illustrate how these factors drive plural healthcare engagement. We consider each one separately, below, and then present a conceptual model for how these factors interrelate to create therapeutic itineraries in southwestern Uganda.

A. *Traditional healers care about their patients*

Patients recruited from traditional healers report positive experiences with their care, specifically describing that treatments effectively relieve their symptoms. Participants state that they prefer traditional therapies because traditional practitioners “heal faster”. This efficient healing is sometimes attributed to the fact that traditional practitioners spend more time personally treating and caring for their patients, compared with healthcare workers in biomedical settings:

> *Those [bonesetters] are super! They heal faster than biomedicals. When you take your patient to a bonesetter, he does not take long to get healed, compared to one in the hospital. In hospitals, the healing process is long because they do not do much more than hanging you there [in traction] and leave you. You can even become lame because they do not check to see whether you are healing or not. But for the healer, he does his reviews [checks your wound healing] constantly. (Bonesetter patient, female)*

Patients receiving traditional care also state that they are treated with respect when visiting healers, and that healers are motivated to care for patients, rather than being strictly economically driven. Participants reported that healers attend to patients immediately, even if they did not have money; a few participants stated that healers allowed them to pay for services rendered in installments, or in kind (through farm goods). A participant seeking care from a traditional birth attendant described her preference for traditional healing, emphasizing the kindness of her practitioner:

> *[The healer] does everything for you. Her services are excellent. In fact, when you deliver [your children] from here, you do not even think of going elsewhere another time. She cares so much about her clients. In fact, for all my pregnancies, I received antenatal care from this healer. She is my neighbor, and instead of going to sit at the hospital the whole day waiting for checkup, I come here. She is my neighbor and her services are good. So, I come get my antenatal checkup, and go back home to do my chores. (Traditional birth attendant patient, female)*

In contrast, patients describe experiences with biomedicine with narratives of disrespect, mistreatment, neglect or "abuse". The central message of these biomedical testimonies is that healthcare workers do not care about their patients. In some cases, participants referred to these accounts while explaining why they tend to avoid biomedical facilities. A woman describes her experience receiving antenatal care at the local hospital:

> *I came to this hospital for antenatal care and found a nurse who treated me badly. She would tell you to lay on the bed and instead of telling you what to do, she would shout at you and say, "Don't face me! Face the other side!" in a loud voice, and you wonder what the problem was. She embarrassed me and I felt ashamed. I promised myself never to return in this hospital …. She would only shout at us. She was horrible. (Biomedical patient, female)*

A number of participants describe experiences at biomedical facilities where they are never attended to by biomedical staff, despite waiting for many hours – sometimes spending the entire day without receiving medical attention. These hours spent waiting come at the expense of childcare, household duties and income-generating activities. One man describes his experience seeking biomedical care for a toothache as follows:

> *I went to the referral hospital and spent there the whole day without treatment. The following morning, when I went back, I was given only Panadol [Acetaminophen]. I felt so sad. (Biomedical patient, male)*

Another patient states that he gave up after waiting all day for a voluntary circumcision procedure:

> *You reach there and sit for the whole day without treatment. Drugs are never there and health workers do not attend to patients as it should be. They arrive at work late and leave work early. They are really bad. I went [to the clinic] one time for circumcision and sat there for many hours until I got hungry and gave up. I left without seeing any doctor. (Bonesetter patient, male)*

B. *Biomedicine uses modern technologies to heal*

Participants state that biomedical care is preferred in instances where "modern" technologies can be utilized to provide a diagnosis for one's symptoms, and guide treatment. Through blood and radiological tests, healthcare providers can identify the specific cause of a patient's illness, and provide appropriate care. Patients perceive that the information generated by biomedical technology validates the therapies administered to them:

> *They use machines to diagnose and test for conditions. The give the right medical information. (Biomedical patient, male).*

Having received a specific diagnosis, participants also believe that the treatment recommended by healthcare workers will be effective in alleviating their symptoms. For example, one participant described how appropriate medicines have the capacity to heal, even if taken in small amounts:

> *When you come [to the clinic] you get diagnosed and they write for you a prescription and you get the medicine then their service is good … Even if you*

> *get very little medicine from them and take it, you get healed. (Biomedical patient, female)*

Another patient explains why the capacity to intervene with modern biomedical technology is more effective in treating symptoms than traditional medicine:

> *Biomedical facilities are good … when you are, for instance, in a critical condition, they can put you on life support machines, or they can put you on a drip. They can also give you tablets and injections that can help you. Traditional healers can't manage something like that. They don't have modern equipment. They don't have tablets, and they don't have drips and injections. (Bonesetter patient, male)*

Results from biomedical testing guide what some participants describe as "proper", effective treatment, compared with traditional healing where therapies are provided in the absence of any diagnostic testing:

> *[Biomedical facilities] diagnose you and inform you of the ailment that you are suffering from, and at times inform you that your health is okay … When you visit biomedical health facilities they diagnose you and inform you of your results and in case you are HIV positive, you can start on medicine … [Traditional healers] don't have equipment to diagnose, so how do they diagnose for conditions? … I don't trust them. (Biomedical patient, Female)*

While biomedicine is favored for its use of diagnostic technologies, other participants describe preference for traditional healing *specifically because* these approaches could enable avoidance of biomedical procedures, which participants describe as "unnecessary" and having high morbidity and mortality. Participants state that an advantage of traditional healing is that it supports the body to heal "naturally", rather requiring modern, invasive interventions. Participants report seeking traditional care after having been told by biomedical providers that they would require an operation in order to recover. Those who ultimately healed after receiving traditional care declared that biomedical providers rush to use modern technologies, instead of allowing the body to heal on its own. One patient describes his experience receiving care from a bonesetter, after suffering severe extremity fractures after falling from a motorcycle:

> *[The hospital staff] told me that the doctors will cut off my leg because it was badly injured and that there was no way they could fix it … When we reached [this healer], they told me that the bone that joins the knee was broken but promised that since I was in that place, in two to three weeks, I will be able to walk again. They then aligned my leg and started the treatment … I am now getting better. If I had remained at the hospital, I know my leg would have been cut off by now. (Bonesetter patient, male)*

Another patient describes how effective treatment from an herbalist allowed her sister to avoid a Caesarean section with her twin pregnancy:

> *These healers are very useful … my elder sister had a problem with her twin pregnancy. She was stuck with the pregnancy because the babies could not move. They took her to one of the traditional healers and was given medicine which helped her so much and she delivered her babies without difficulties. We*

> *thought she would be operated on while giving birth [via Caesarean section] because the doctors at referral hospital had told her that she will not manage to push and advised her to go for an operation, which did not happen because of the medicine the healer gave her. (Spiritual healer patient, female)*

Participants described fear of utilizing biomedical facilities to deliver their children, as they believed that physicians would perform unnecessary Caesarian sections, considered a high-risk procedure for both mothers and infants:

> *[Doctors] rush women to the operating theatre when it's not necessary. Many women and babies have lost their lives due to the negligence of doctors. Women fear to deliver from hospital. (Spiritual healer patient, male)*

C. *Peer "testimony" influences healthcare engagement*

Our participants recount social narratives, or "testimonies" which describe healthcare experiences among peers within their communities. These discursive events evaluate a provider's competence and effectiveness in addressing ailments, and describe negative or positive outcomes of treatments. Participants indicate that peer testimonies strongly influence where they choose to seek care for their symptoms. We found that biomedical narratives frequently reinforced individual reports of mistreatment; in contrast, narratives about traditional healing were generally positive and affirmed the "real" nature of this form of healthcare.

Numerous participants who received care from traditional healers describe negative peer narratives about biomedicine. A participant describes the testimony from his neighbor that influenced his decision to seek care from a traditional bonesetter:

> *My neighbor reached [the referral hospital after injuring his leg], but nothing much was done. They made him sit on the waiting bench and the doctor told the caretaker to go and buy a bandage and find an empty box. The doctor then dismantled the box and tied it on the leg using the bandage and left him there. He remained there until morning. …. He never got any treatment [for the leg injury] apart from the empty boxes they tied on the leg. I will never forget what he experienced from the referral hospital. It was so bad and so discouraging. Health workers do not care about patients. (Bonesetter patient, male)*

A number of participants recalled community narratives indicating that healthcare workers would intentionally withhold treatment or harm their patients. One woman seeking care at a traditional birth attendant practice describes stories that made her fear that she would be harmed at the hands of healthcare workers:

> *There was a woman in labor who was supposed to be taken to the operating theatre but the nurses asked her for money, which she did not have. They refused to work on her until other patients contributed some money and gave it to the nurses … Those nurses do not mind whether you die from there or not … There is also one mother I heard about who took her child for immunization and got an argument with the nurse. Intentionally the nurse gave the child overdose and the child died. Some of these health workers are so wicked. (Herbalist patient, female)*

Negative peer testimonies were not limited to patients of healers. For example, one woman seeking biomedical care told a story about her neighbor suffering mistreatment at the same facility.

> *My pregnant neighbor delivered her baby in the village compound. [When they arrived at this hospital for post-partum care], the nurse abused her, saying that she should take her stupidity back to her village. They do not care. (Biomedical patient, female).*

In stark contrast to narratives surrounding biomedical care, peer testimony surrounding traditional healing is largely positive. Healers are lauded for their effective care, and patients are guided by peer testimonials in selecting which healer to visit for their ailments. One participant seeking care at a traditional herbalist describes the impact of peer endorsements on her decision to seek care from this particular healer:

> *This healer is popular and well known, and wherever you go, people will recommend her to treat your sick child … I have seen so many different people come here to receive treatment … I am impressed. (Spiritual healer patient, male).*

A central concept in many testimonies about traditional medicine is the genuineness of the healer, and how they should be set apart from traditional healers who may be "fake" or "quacks". One participant describes how testimonies from peers with similar injuries directed him to seek care from a specific bonesetter, and how testimonies generate more patients for particular healers:

> *Most traditional healers are quacks, and personally I don't trust them. [Interviewer: Then how do you know that you will heal from this treatment?] I get the confidence from other people who have been treated here. There is a man from a nearby dairy. He bones were more severely broken than mine, but he healed from here, and is now doing his work. I have heard many people's testimonies that they have been healed from here … When I come here and get healed, I will direct another one because he will be healed too and that person will also direct others… A healer who is real does not need to advertise on the radios because the people they heal create market for them. (Bonesetter patient, male)*

D. Conceptual Model

Figure 1 presents a conceptual model integrating our findings to show how influences at the healthcare provider, healthcare system, and peer levels influence individual engagement with healthcare in pluralistic settings. These variables interact to shape an individual's therapeutic itinerary, but not necessarily in a stepwise manner. For healthcare users, one or more characteristics of a healthcare system may be of paramount importance in determining use of this resource, but each modality comes with potential disadvantages. Negative experiences could prompt users to switch to the alternate modality. We heard this process described by participants who believed their ailments were initially mismanaged by biomedical providers, and were subsequently healed using traditional approaches. Similarly, positive experiences contribute towards continued use of a healthcare modality, and an individual may become reticent to engage with the alternative in light of continued positive health outcomes.

DISCUSSION

This study identified variables that drive engagement with healthcare resources in a medically pluralistic setting, and identified three central factors that contribute to therapeutic pluralism. These may be summarized as follows: 1) traditional healers care about their patients, while biomedical providers do not; 2) biomedical technologies can provide diagnosis and guide treatment, but these technologies are sometimes intentionally avoided; and 3) peer testimonies influence healthcare utilization, largely in favor of traditional healing. These can be considered conceptually as factors operating at the healthcare provider, healthcare system, and peer levels (Figure 1).

Our work illustrates how healthcare provider characteristics are of central importance to patients. The quality of interpersonal interactions can either motivate or deter engagement with healthcare services. We found that patient-provider interactions with traditional healers are described as generally respectful and supportive, while patient-provider interactions in biomedical contexts included narratives of neglect and "abuse". These findings align prior work showing that initial choice of therapeutic modality in pluralistic contexts is driven by perceived trustworthiness of a healthcare provider[22,46-49]. Our participant accounts of negative interactions with biomedical staff are congruent with prior work linking negative interactions with disengagement with HIV care among people living with HIV[4-6], decreased HIV pre-exposure prophylaxis (PrEP) utilization among key populations[7] and lack of healthcare facility use among pregnant women[8-10].

We also describe how some characteristics of the available healthcare systems impact healthcare engagement. Our results speak to the hegemony of biomedicine in Uganda, and more broadly throughout post-colonial sub-Saharan Africa, where biomedicine is highly valued, and may be considered of superior quality and efficacy compared with traditional healing[11,12]. Some participants report gaining reassurance through laboratory and radiologic testing to guide diagnosis and therapy, describing this as "proper" treatment. We note that the desire for healthcare directed by "modern" test results is the central factor favoring biomedical healthcare utilization among our participants. Interestingly, other data from high-resource contexts has shown that diagnostic test results do not increase patient reassurance or decrease health-related anxiety in outpatient biomedical settings[50,51]. However, in our medically pluralistic study site, the capacity of biomedical facilities to perform diagnostic testing is distinctive in contrast to traditional medicine approaches, and therefore some patients consider access to testing as a benefit.

Traditional healthcare is sometimes preferred as a means to avoid invasive procedures, such as orthopedic fixation, limb amputation, or Caesarean section. Our findings are congruent with prior research demonstrating avoidance of facility-based obstetric services, preference for traditional home birth[10,36,52], and bonesetters to heal orthopedic injuries in sub-Saharan Africa[53,54]. Motivation to avoid invasive operative procedures is further explained by poor post-operative outcomes throughout sub-Saharan Africa[55]. For example, maternal mortality after Caesarean section is fifty times higher in Africa compared with high income countries[56]. As such, patients consider invasive biomedical procedures high risk, and seek to avoid them through receipt of traditional therapies.

Additionally, we note that the content of peer testimonies strongly influences patients' decisions to utilize traditional or biomedical care. Peer influences have been shown to

have strong impact on individual healthcare engagement in the cases of HIV services utilization[57-59], adolescent health[60,61], mental health[62], and substance misuse[63], for example. Our study shows how peer testimonies serve as endorsements of traditional healing, legitimizing its use through descriptions of clinical effectiveness. In contrast, largely negative narratives regarding biomedicine potentiate avoidance of these facilities and services.

Our findings provide insight on how patients decide to engage with particular healthcare resources, and can guide efforts to improve healthcare quality and interventions in medically pluralistic communities. Importantly, our conceptual model can direct strategies to engage those who may avoid biomedical resources, and have low uptake of conventional healthcare outreach program, which are frequently facility-based, and/or delivered by biomedical providers. Our data suggest that healthcare users value the interpersonal interactions and trustworthiness of healers, but also may gain reassurance through receipt of biomedical testing and diagnostic technologies. An ideal health resource in a pluralistic context would potentially incorporate all of these valuable attributes. Traditional healers in Ghana have taken this approach, utilizing components of biomedical knowledge through reference to medical textbooks and “Google”[64]. Similarly, we know of healers in Mbarara District who use glucometers, blood pressure cuffs, and performed commercially available rapid diagnostics tests for HIV and malaria. Our data suggest that decentralized healthcare services would be highly acceptable among pluralistic communities. An example of his approach at the national health policy level is demonstrated in the case of “differentiated care” for PLHIV[20], where service delivery is tailored to the needs of PLHIV in their communities, and biomedical facility visits are minimized.

Finally, our data contribute to a body of work that emphasizes the important role of traditional healers within the communities they serve. We hope our findings explain the persistent appeal of traditional medicine, and demonstrate that pluralistic behavior should be considered more than ‘an inconvenient truth’ for biomedical providers, researchers and policy makers. Low biomedical engagement in pluralistic settings should not simply be attributed to lack of access to formal resources, but should be considered an individual’s informed healthcare choice. We recommend that researchers and policy makers involve traditional healers when designing and implementing community-based health initiatives because healers are well positioned allies for healthcare programs. Community members may consider healers more trustworthy than biomedical providers[49]. Biomedicine could learn a great deal from healers regarding the power of interpersonal relationships as part of the healthcare process[13,14]. For example, Moshabela et. al. (2016) considered the roles of traditional healers in the context of a community-wide HIV testing and treatment intervention. They found that healers boosted impact and acceptability of the intervention through educating clients on HIV-related stigma and supporting linkage to HIV care[19].

Many studies have shown that healers are interested in working with biomedical providers to improve health outcomes for their patients[29,65,66]. However, the converse is not typically the case. Biomedical objections to traditional healing largely focus on use of alternatively explanatory mechanisms (such as belief that evil spirits or bad luck may cause physical symptoms), lack of standardized training and oversight of practices, and delivery of varying concentrations or mixtures of herbal therapies[15]. In fact, negative attitudes towards traditional medicine have been described as the primary barrier to true collaboration between traditional and biomedicine, as biomedical providers

repeatedly downplay the skills and contributions of traditional healers[16,17]. Biomedical providers may express distrust and disapproval of traditional medicine in interactions with their patients[16-18]. Related to this lack of trust is the observation that our participant groups reported markedly different experiences with pluralistic healthcare utilization. Most biomedical participants denied prior use of traditional medicine, while most traditional medicine users reported having previously sought biomedical care. This difference in self-reporting is likely an example of a well described phenomenon, where patients are reticent to disclose traditional medicine use in the context of receiving biomedical care[18,67,68]. Therefore, we suspect that participants seeking care in the biomedical context under-reported traditional medicine use due to fear of social judgement.

There are a few limitations of this study. We acknowledge that baseline characteristics of participants recruited from traditional healer practices are different than those recruited from an outpatient biomedical practice. Qualitative samples are intended to be relevant to the research question, and may not be representative, as would be prioritized in a quantitative study. We did not record medical histories for our participants, and cannot speak to how particular diagnoses may motivate to healthcare itinerary, beyond the symptoms prompting the current visit. This study includes only people seeking healthcare from traditional healers, and similar work is needed for those seeking care from faith healers. Further, we acknowledge the potential impact of social judgement and recognize that some biomedical participants may have been reticent to share positive feelings about traditional medicine during their interviews. Last, our qualitative data indicate multiple directions for future research. For example, what are strategies to facilitate bidirectional cooperation between traditional and biomedical systems? How would one design and implement a decentralized healthcare initiative in cooperation with traditional healers?

CONCLUSIONS

Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which can influence patients' therapeutic itineraries, and illustrate why traditional medicine is sometimes preferred. Our findings can inform community-based, public health interventions in medically pluralistic contexts, and underscore the importance of recognizing and engaging with traditional healers as important stakeholders in community health.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the work of our research assistants, Patricia Tushemereirwe, Donny Ndazima and Doreen Nabukalu. We are grateful to the traditional healers and patients in Mbarara District for sharing their experiences with us.

CONTRIBUTORSHIP STATEMENT

RS conceived of the study. RK and JMA provided input on study design, study procedures. RS and JMA oversaw data collection. RS was primarily responsible for data analysis, with input from JMA, RK and NW. RS composed the first draft of the manuscript. All authors provided input and approve of the final submission.

COMPETING INTERESTS

The authors declare no competing interests.

FUNDING
This study was supported by the National Institutes of Health (K23 MH111409), PI: Sundararajan. RK is supported by the National Institutes of Health (R01 MH109337). The study funder did not have any role in the study design, collection, analysis, interpretation of data, nor in the decision to submit the article for publication. All authors are independent from the funders, and had full access to all of the data. All authors take responsibility for the integrity of the data and accuracy of the data analysis.

DATA SHARING STATEMENT
Deidentified data may be shared upon reasonable request by emailing the first author.

PATIENT AND PUBLIC INVOLVEMENT STATEMENT
Patients were included as participants in this study. They did not directly participate in the design or implementation of the study, as the purpose of the study was to elicit patient perspectives on community healthcare resources. Results of this study were used to guide development of a study community advisory board, which includes patients and other stakeholders, including healthcare providers, traditional healers and community leaders.

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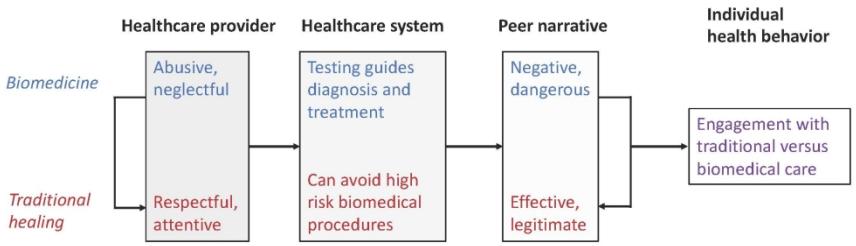
FIGURE CAPTION

Figure 1. Conceptual model showing key factors within various levels (healthcare provider, healthcare system, peer) influencing individual health behavior within medically pluralistic contexts. Each factor differentially influences an individual's therapeutic itinerary. Negative factors may motivate a switch to the other modality, and positive factors contribute towards continued use of a particular healthcare modality. This model

is not inclusive of all variables that influence health engagement, but illustrates categories that were described by our participants in driving their healthcare decision making, specifically regarding decisions to utilize traditional or biomedical care.



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338x190mm (200 x 200 DPI)

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	3-4
Purpose or research question - Purpose of the study and specific objectives or questions	4
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	6
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Context - Setting/site and salient contextual factors; rationale**	4-5
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Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	7
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	5-6
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-7
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-7
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	6

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-12
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-12

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	15

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	16
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	16

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

BMJ Open

A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-033410.R3
Article Type:	Research
Date Submitted by the Author:	23-Mar-2020
Complete List of Authors:	Sundararajan, Radhika; Weill Cornell Medical College, Center for Global Health; Weill Cornell Medical College, Emergency Medicine Mwanga-Amumpaire, Juliet; Mbarara University of Science and Technology King, Rachel; UCSF Medical Center, Global Health Sciences Ware, Norma; Harvard Medical School, Global Health and Social Medicine
Primary Subject Heading:	Global health
Secondary Subject Heading:	Complementary medicine
Keywords:	COMPLEMENTARY MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, QUALITATIVE RESEARCH, PUBLIC HEALTH

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A conceptual model for pluralistic healthcare behavior: results from a qualitative study in southwestern Uganda

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ABSTRACT

Introduction: *Medical pluralism*, or concurrent utilization of multiple therapeutic modalities, is common in various international contexts, and has been characterized as a factor contributing to poor health outcomes in low-resource settings. Traditional healers are ubiquitous providers in most regions, including the study site of southwestern Uganda. Where both informal and formal healthcare services are both available, patients do not engage with both options equally. It is not well understood why patients choose to engage with one healthcare modality over the other. The goal of this study was to explain therapeutic itineraries and create a conceptual framework of pluralistic health behavior.

Methods: In-depth interviews were conducted from September 2017 – February 2018 with patients seeking care at traditional healers (N=30) and at an outpatient medicine clinic (N=30) in Mbarara, Uganda; the study is nested within a longitudinal project examining HIV testing engagement among traditional healer-utilizing communities. Inclusion criteria included age ≥18 years, and ability to provide informed consent. Participants were recruited from practices representing the range of healer specialties. Following an inductive approach, interview transcripts were reviewed and coded to identify conceptual categories explaining healthcare utilization.

Results: We identified three broad categories relevant to healthcare utilization: 1) traditional healers treat patients with "care"; 2) biomedicine uses "modern" technologies; and 3) peer "testimony" influences healthcare engagement. These categories describe variables at the healthcare provider, healthcare system, and peer levels that interrelate to motivate individual engagement in pluralistic health resources.

Conclusions: Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which influence patients' therapeutic itineraries. Our findings provide a basis to improve health outcomes in medically pluralistic settings, and underscore the importance of recognizing traditional healers as important stakeholders in community health.

Keywords: Medical pluralism, Uganda, traditional healers, qualitative

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study illuminates factors that motivate engagement with healthcare resources by using data from biomedical and traditional medicine utilizers
- This study employed qualitative methods to explore participants' own experiences of healthcare modalities, and identify perceived advantages and disadvantages of each form of healing
- While the data gathered is highly contextual and specific to the study context, the conceptual model presented offers a broad application to other medically pluralistic communities
- This conceptual model could be used to guide healthcare initiatives, policies, and research in pluralistic settings

INTRODUCTION

Medical pluralism, or utilization of multiple therapeutic modalities, is common where both biomedical and complementary or alternative treatments are available to patients. This pattern of healthcare engagement is observed in both high-[1,2] and low-resource settings[3-6], and is well described for patients with both acute[7-9] and chronic illness[10-13] in various international contexts. In low- and middle-income countries, complementary and alternative healthcare services are often provided by traditional healers, who practice outside of the formal biomedical system. Traditional healers are broadly defined by the World Health Organization as: 1) persons recognized by local community as healers; 2) having regular patient attendance; and 3) having space to receive and treat patients[14]. They "provide health care by using plant, animal and mineral substances, and other methods based on social, cultural, and religious practices" [14]. It is estimated that 80% of the population in sub-Saharan Africa visit traditional healers[5].

As such, traditional healers are an initial point of contact for patients in medically pluralistic settings. Patients may prefer informal health services from traditional healers because of their increased accessibility: healers are present in higher numbers than physicians and biomedical facilities, particularly in low-resource settings[5]. However, their popularity cannot be strictly explained by convenience. Research in urban regions having high density of biomedical institutions demonstrates similar reliance on traditional healers[1,3]. Patients may also seek out traditional therapies to address symptoms attributed to ancestral curses or bewitching, believed incurable by biomedicine[15]1. Use of traditional medicine is also strongly tied to local religious and ethnic identities[16]. Patients may pursue traditional healing in the setting of biomedicine treatment "failure", when symptoms worsen or persist despite ongoing therapies[6,17,18].

Prior research has shown that traditional healer use is a factor contributing to poor health outcomes among patients. For example, receiving care from a traditional healer has been shown to delay HIV testing and antiretroviral therapy (ART) initiation[19], and interrupt HIV treatment[18] for people living with HIV (PLHIV). In Mozambique, PLHIV initially seeking care from traditional healers experienced significantly longer delays to diagnosis compared with those who did not utilize healers; this delay exponentially grew with corresponding increases in the number of healers consulted prior to receiving HIV testing[19]. In South Africa, medical pluralism was shown to be negatively associated with ART use in a cohort of PLHIV[20]. Use of traditional healers was also identified as an important variable contributing to the recent Ebola outbreak in West Africa[21]. Studies have demonstrated that medical pluralism similarly contributes to poor outcomes

for non-infectious diseases, such as nonadherence to chemotherapy for cancer[4,22], or poor outpatient linkage to care for patients with hypertension[12].

Because they are frequently consulted for most types of illness, traditional healers could be important allies for public health initiatives. Some programs have attempted to engage with healers for these purposes, which have included trainings for healers to deliver counseling and facility referral for HIV[23,24], TB[25], or malaria testing[7], or to increase uptake of prenatal care[26] and mental health treatment[27]. However, in most cases, program effectiveness has been limited by the fact that patients may not complete referrals to facilities. These findings highly the fact that where both informal and formal healthcare services are available, patients do not engage with both options equally.

There remains a critical lack of understanding about why patients choose to utilize one healthcare resource, but not another. It is clear that biomedicine and traditional healing offer distinctive forms of healthcare for patients. But there is a dearth of knowledge on perceived advantages and disadvantages of each modality from the perspective of the healthcare user. Without this information, healthcare initiatives in pluralistic settings cannot be truly "patient-centered", and are at risk for failure. The goal of this study was to identify factors that motivate engagement with healthcare resources in a sub-Saharan African context, using qualitative research methods. We sought to explain therapeutic itineraries by conducting interviews with users of biomedical and traditional healthcare resources. These data were used to develop a general, conceptual framework that can inform future work in similar medically pluralistic settings.

METHODS

Study Setting and Design

This qualitative study was conducted in Mbarara District, Uganda, a rural district of 418,000 residents located ~275 km southwest of the capital city of Kampala. Southwestern Uganda is a medically pluralistic context, where both traditional and biomedical modalities of healthcare co-exist[28-30].

The World Health Organization defines "traditional medicine practices" to include both medication and procedure-based treatments, including use of herbal remedies, manual physical manipulation, and spiritual therapies[5,14]. The scope of treatments delivered by healers throughout the world varies by location. In Uganda, traditional healers practice herbalism and spiritual healing[31]; they also set broken bones[32] and attend births in the community[33]. Spiritual healers attribute their powers to the *Bachwezi*, which are believed to be ancestral spirits from an ancient kingdom that previously occupied this region of eastern Africa[34,35]. For the purposes of this study, we excluded Christian or Muslim spiritual healers (i.e., "Born Again" or Pentecostal ministries), which have been extensively studied in sub-Saharan Africa as "faith healers" [18,36]. In Uganda, traditional healing is not formally recognized by the Ministry of Health; there is no centralized oversight of traditional healing training programs or services. This research was conducted as part of a multi-year, mixed methods study of HIV services engagement in a medically pluralistic community.

Sampling and Recruitment

Following a purposive sampling strategy, sixty (N=60) adults were identified to participate as key informants in this study, or "individuals that are especially

knowledgeable about or experienced with a phenomenon of interest"[37]. In our case, key informants were selected to represent variation in experiences of receiving modalities of healthcare: biomedical and traditional. That is, participants were patients representing two subgroups: (1) individuals receiving treatment from traditional healers (N=30), and (2) individuals receiving treatment from a biomedical general medicine outpatient clinic (N=30). Inclusion criteria for all participants were: 1) age ≥18 years; 2) ability to provide informed consent; and 3) seeking healthcare at either a traditional healer or outpatient biomedical clinic in Mbarara District.

Both verbal and written informed consent were obtained by Ugandan research assistants (RAs) prior to enrollment. After verbally reviewing the consent form, research staff used a 5-item questionnaire to assess whether the potential participant understood the study and consent process. This questionnaire posed questions critical to demonstrating consent, such as "How much time will this take you?"; "What are the possible benefits for you?". If a potential participant demonstrated errors in understanding, these were corrected, and potential participants asked if they needed further clarification. If, after further attempts to clarify misunderstandings, study staff determined that the potential participant did not comprehend the consent process, or critical aspects of the study, they were not enrolled.

Participants in the traditional medicine subgroup were recruited from twelve traditional healer practices which reflected the range of healer specialties present in the study region: herbalist, bone setter, traditional birth attendant, and spiritual healer. All were located within 20 kilometers of Mbarara town center. It is well established that men tend to have low uptake of in healthcare services in sub-Saharan Africa[38-40]. In order to ensure that male perspectives were represented, we recruited two-thirds of participants at healer practices who were known to provide services for men. Therefore, more bonesetter and spiritual healer patients are included in the traditional healer group. Participants in the biomedical subgroup were recruited from Mbarara Municipality Clinic, a general outpatient government-run clinic in the town of Mbarara, which serves approximately 50,000 patients per year. Services at this clinic are provided free of charge.

At both traditional and biomedical facilities, RAs approached patients following completion of visits to assess eligibility and interest in participation. Potential participants were individually recruited by RAs, who visited recruitment sites once per week during business hours to screen for eligible patients. Recruitment visits were scheduled on random days of the week to maximize variation of participants included in this study. A maximum of two participants was enrolled during each site visit in order to allow ample time to review informed consent and conduct minimally-structured interviews. This approach ensured interview quality, and was central to the inductive data analysis process by providing time to review interview content, provide feedback to RAs, and identify preliminary codes (see "Data Collection" and "Analysis of Data" sections for more details). Biomedical clinic leadership and traditional healers gave permission for study staff to recruit patients at their practices. Recruitment was carried out over a period of six months (September 2017 - February 2018).

A target sample size of 30 participants per subgroup was guided by prior research suggesting that a range between 20 and 30 interviews is adequate to reach *thematic saturation*, the point at which no new concepts emerge from subsequent interviews[41-43]. After 30 interviews per group were conducted, the study authors agreed that

thematic saturation had been reached, and interview content no longer contained new or surprising content.

Data Collection

Three Ugandan Research Assistants (RAs), two female and one male, with prior experience in conducting qualitative interviews in southwestern Uganda collected data for this study. Prior to initiation of data collection, all RAs took part in a three-day training session led by RS and JMA, which focused on the principles of qualitative research, approaches to conducting high quality interviews, and establishing standard procedures for interview translation and transcription. In addition, the RAs underwent intensive training with interview guide questions to ensure consistency of delivery and use throughout the study.

Each study participant took part in a single, individual, in-depth interview with one of these RAs. Interviews were conducted following an interview guide that included the following topics: 1) details of the patient's therapeutic itinerary for his/her current symptoms; 2) symptoms that motivated him/her to seek healthcare; 3) attitudes towards, and experiences with, traditional and biomedicine; and 4) details of concurrent or recent biomedical and traditional healer visits. The interview guide was created in English, translated to the local language (Runyankore), and back-translated into English to verify preservation of meaning. In addition, the interview guide was piloted with three traditional healers prior to initiation of data collection in August 2017; these responses were not included in our analysis.

Interviews lasted approximately one hour and were conducted in the local language (Runyankore), in private locations at either healer practices or at the participating biomedical clinic. Participants received the equivalent of 10,000 Ugandan Shillings (UGX, ~$3 USD) in household staples (cooking oil, sugar, salt, soap) in recognition of the time and effort required to participate in the interview.

Interviews were digitally recorded, then transcribed and translated into English by the same RA who had conducted the interview. All transcripts were produced within 72 hours of the interview being completed. The transcripts were reviewed line-by-line by the first author for quality, content, and to provide feedback to the RAs regarding strategies to improve interviewing techniques. This monitoring process allowed for RAs to receive consistent feedback to improve interviewing skills to ensure that interviews were consistently high quality, explored participants unique experiences, and focused on interview guide topics across interviewers. Though some variation is expected in qualitative interview data, we maximized the validity of our data by continuing enrollment until thematic saturation was reached in each participant group (please see "Sampling and Recruitment", above). English transcripts were spot-checked against audio recordings by an author (JMA, who is fluent in Runyankore and English) to ensure validity and integrity of translations.

Analysis of Data

A three-step, inductive approach was used to analyze the qualitative data, as follows: (1) development of codes; (2) coding; and (3) category construction. We employed an interpretive phenomenological approach to data analysis[44,45], as the goal of this study was to explore participants' own experiences and perspectives on healthcare engagement.

Development of Codes.

Two authors (RS and JMA) reviewed transcripts within 72 hours of completion and corresponded weekly to identify and discuss emerging concepts. Guided by these discussions, the first author (RS) produced an initial set of codes, or labels that described key concepts in the dataset. Using an inductive strategy, this process was conducted while interviews were ongoing, providing overlap between qualitative interviewing and data analysis, allowing for iterative engagement with the dataset to identify concepts of interest. As additional transcripts were produced and reviewed, codes were reviewed and refined to fit the data. Using the "constant comparison" method, newly coded text segments were compared to text segments previously marked with the same code to determine if they reflected the same concept[46]. This process was repeated until all transcripts had been reviewed. A final list of codes was produced through discussion and consensus among three co-authors (RS, JMA and RK).

Coding:

All study transcripts were coded, and re-coded when necessary, using the finalized list of codes. QSR NViVo 11 (QRS International Pty Ltd) was used for coding and data organization, but not in development of codes.

Category Construction:

Next, coded data were examined and grouped to form conceptual categories, where data are aggregated based on similarities of meaning. Categories are defined below using text examples. Quotes from participants are shown as italicized and indented. Interrelationships between categories were identified to create a conceptual framework illustrating factors that influence health behavior in a pluralistic context (Figure 1).

Ethical Statement:

This research was approved by the Human Research Protections Program Institutional Research Board at the University of California, San Diego (#170672), Weill Cornell Medical College (#1803019105), Mbarara University of Science and Technology Research Ethics Committee (#16/01-17) and the Ugandan National Council for Science and Technology (#SS4338). Participants provided written and verbal informed consent in Runyankore.

TABLE 1. CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristic	Traditional healer clients (N=30)	Biomedical clients (N=30)
Report previously receiving care from alternate modality	N=30 (100%)	N=2 (7%)
Age (in years)	30 (median) IQR = 20	28.5 (median) IQR = 10.75
Female gender (%)	N = 16 (53%)	N= 18 (60%)
Primary school education or less	N= 14 (47%)	N = 13 (43%)
Household size (in persons)	5 (median) IQR = 3	4.5 (median) IQR = 3.5
Marital status	Single (N = 7) Married/Cohabiting (N = 21) Widowed (N = 2)	Single (N = 11) Married/Cohabiting (N = 17) Widowed (N = 2)
Christian religion	N = 25 (83%)	N = 23 (77%)
Monthly household income (in USD)	$41 (median), IQR = 76	$22 (median) IQR = 46
Type of healer visited on day of enrollment	Spiritualist (N=12) Bonesetter (N=10) Traditional birth attendant (N=4) Herbalist (N=4)	N/A

RESULTS

Characteristics of Participants

Characteristics of study participants appear in Table 1. Over half of the sample had

clinical experience with both biomedical and traditional modalities of healthcare. However, pluralistic behaviors were much more commonly reported among patients of traditional healers. Only two participants recruited from the biomedical clinic reported prior experience receiving care from traditional healers (n=2/30, 7%); in contrast, all (n=30) traditional healer patients reported prior experience receiving biomedical treatment.

Participants recruited from healer practice locations were slightly older, with a higher proportion being married, and with higher reported monthly incomes, compared to the biomedicine group. Biomedical participants were recruited from a government-run medical clinic, where they received health services at no cost. Therefore, we would expect lower household incomes, as they have preferentially sought to receive free medical care, rather than present to a fee-for-service facility. Other characteristics, including gender, household size, highest level of education, and religious affiliation, were similar between the two groups.

Qualitative Results

Overview

Our qualitative data indicate important perceived advantages and disadvantages to both healthcare modalities, which motivate patient engagement with available resources. We have developed three broad categories representing influences on therapeutic itineraries that were evident in the data. They are summarized as follows: 1) traditional healers treat patients with “care”; 2) biomedicine uses “modern” technologies; and 3) peer “testimony” influences healthcare engagement. Within each of these categories, we provide examples to illustrate how these factors drive plural healthcare engagement. We consider each one separately, below, and then present a conceptual model for how these factors interrelate to create therapeutic itineraries in southwestern Uganda.

A. *Traditional healers care about their patients*

Patients recruited from traditional healers report positive experiences with their care, specifically describing that treatments effectively relieve their symptoms. Participants state that they prefer traditional therapies because traditional practitioners “heal faster”. This efficient healing is sometimes attributed to the fact that traditional practitioners spend more time personally treating and caring for their patients, compared with healthcare workers in biomedical settings:

> *Those [bonesetters] are super! They heal faster than biomedicals. When you take your patient to a bonesetter, he does not take long to get healed, compared to one in the hospital. In hospitals, the healing process is long because they do not do much more than hanging you there [in traction] and leave you. You can even become lame because they do not check to see whether you are healing or not. But for the healer, he does his reviews [checks your wound healing] constantly. (Bonesetter patient, female)*

Patients receiving traditional care also state that they are treated with respect when visiting healers, and that healers are motivated to care for patients, rather than being strictly economically driven. Participants reported that healers attend to patients immediately, even if they did not have money; a few participants stated that healers allowed them to pay for services rendered in installments, or in kind (through farm goods). A participant seeking care from a traditional birth attendant described her preference for traditional healing, emphasizing the kindness of her practitioner:

> *[The healer] does everything for you. Her services are excellent. In fact, when you deliver [your children] from here, you do not even think of going elsewhere another time. She cares so much about her clients. In fact, for all my pregnancies, I received antenatal care from this healer. She is my neighbor, and instead of going to sit at the hospital the whole day waiting for checkup, I come here. She is my neighbor and her services are good. So, I come get my antenatal checkup, and go back home to do my chores. (Traditional birth attendant patient, female)*

In contrast, patients describe experiences with biomedicine with narratives of disrespect, mistreatment, neglect or "abuse". The central message of these biomedical testimonies is that healthcare workers do not care about their patients. In some cases, participants referred to these accounts while explaining why they tend to avoid biomedical facilities. A woman describes her experience receiving antenatal care at the local hospital:

> *I came to this hospital for antenatal care and found a nurse who treated me badly. She would tell you to lay on the bed and instead of telling you what to do, she would shout at you and say, "Don't face me! Face the other side!" in a loud voice, and you wonder what the problem was. She embarrassed me and I felt ashamed. I promised myself never to return in this hospital …. She would only shout at us. She was horrible. (Biomedical patient, female)*

A number of participants describe experiences at biomedical facilities where they are never attended to by biomedical staff, despite waiting for many hours – sometimes spending the entire day without receiving medical attention. These hours spent waiting come at the expense of childcare, household duties and income-generating activities. One man describes his experience seeking biomedical care for a toothache as follows:

> *I went to the referral hospital and spent there the whole day without treatment. The following morning, when I went back, I was given only Panadol [Acetaminophen]. I felt so sad. (Biomedical patient, male)*

Another patient states that he gave up after waiting all day for a voluntary circumcision procedure:

> *You reach there and sit for the whole day without treatment. Drugs are never there and health workers do not attend to patients as it should be. They arrive at work late and leave work early. They are really bad. I went [to the clinic] one time for circumcision and sat there for many hours until I got hungry and gave up. I left without seeing any doctor. (Bonesetter patient, male)*

B. *Biomedicine uses modern technologies to heal*

Participants state that biomedical care is preferred in instances where "modern" technologies can be utilized to provide a diagnosis for one's symptoms, and guide treatment. Through blood and radiological tests, healthcare providers can identify the specific cause of a patient's illness, and provide appropriate care. Patients perceive that the information generated by biomedical technology validates the therapies administered to them:

They use machines to diagnose and test for conditions. The give the right medical information. (Biomedical patient, male).

Having received a specific diagnosis, participants also believe that the treatment recommended by healthcare workers will be effective in alleviating their symptoms. For example, one participant described how appropriate medicines have the capacity to heal, even if taken in small amounts:

When you come [to the clinic] you get diagnosed and they write for you a prescription and you get the medicine then their service is good … Even if you get very little medicine from them and take it, you get healed. (Biomedical patient, female)

Another patient explains why the capacity to intervene with modern biomedical technology is more effective in treating symptoms than traditional medicine:

Biomedical facilities are good … when you are, for instance, in a critical condition, they can put you on life support machines, or they can put you on a drip. They can also give you tablets and injections that can help you. Traditional healers can't manage something like that. They don't have modern equipment. They don't have tablets, and they don't have drips and injections. (Bonesetter patient, male)

Results from biomedical testing guide what some participants describe as "proper", effective treatment, compared with traditional healing where therapies are provided in the absence of any diagnostic testing:

[Biomedical facilities] diagnose you and inform you of the ailment that you are suffering from, and at times inform you that your health is okay … When you visit biomedical health facilities they diagnose you and inform you of your results and in case you are HIV positive, you can start on medicine … [Traditional healers] don't have equipment to diagnose, so how do they diagnose for conditions? … I don't trust them. (Biomedical patient, Female)

While biomedicine is favored for its use of diagnostic technologies, other participants describe preference for traditional healing *specifically because* these approaches could enable avoidance of biomedical procedures, which participants describe as "unnecessary" and having high morbidity and mortality. Participants state that an advantage of traditional healing is that it supports the body to heal "naturally", rather requiring modern, invasive interventions. Participants report seeking traditional care after having been told by biomedical providers that they would require an operation in order to recover. Those who ultimately healed after receiving traditional care declared that biomedical providers rush to use modern technologies, instead of allowing the body to heal on its own. One patient describes his experience receiving care from a bonesetter, after suffering severe extremity fractures after falling from a motorcycle:

[The hospital staff] told me that the doctors will cut off my leg because it was badly injured and that there was no way they could fix it … When we reached [this healer], they told me that the bone that joins the knee was broken but promised that since I was in that place, in two to three weeks, I will be able to walk again. They then aligned my leg and started the treatment … I am now

> *getting better. If I had remained at the hospital, I know my leg would have been cut off by now. (Bonesetter patient, male)*

Another patient describes how effective treatment from an herbalist allowed her sister to avoid a Caesarean section with her twin pregnancy:

> *These healers are very useful … my elder sister had a problem with her twin pregnancy. She was stuck with the pregnancy because the babies could not move. They took her to one of the traditional healers and was given medicine which helped her so much and she delivered her babies without difficulties. We thought she would be operated on while giving birth [via Caesarean section] because the doctors at referral hospital had told her that she will not manage to push and advised her to go for an operation, which did not happen because of the medicine the healer gave her. (Spiritual healer patient, female)*

Participants described fear of utilizing biomedical facilities to deliver their children, as they believed that physicians would perform unnecessary Caesarian sections, considered a high-risk procedure for both mothers and infants:

> *[Doctors] rush women to the operating theatre when it's not necessary. Many women and babies have lost their lives due to the negligence of doctors. Women fear to deliver from hospital. (Spiritual healer patient, male)*

C. *Peer "testimony" influences healthcare engagement*

Our participants recount social narratives, or "testimonies" which describe healthcare experiences among peers within their communities. These discursive events evaluate a provider's competence and effectiveness in addressing ailments, and describe negative or positive outcomes of treatments. Participants indicate that peer testimonies strongly influence where they choose to seek care for their symptoms. We found that biomedical narratives frequently reinforced individual reports of mistreatment; in contrast, narratives about traditional healing were generally positive and affirmed the "real" nature of this form of healthcare.

Numerous participants who received care from traditional healers describe negative peer narratives about biomedicine. A participant describes the testimony from his neighbor that influenced his decision to seek care from a traditional bonesetter:

> *My neighbor reached [the referral hospital after injuring his leg], but nothing much was done. They made him sit on the waiting bench and the doctor told the caretaker to go and buy a bandage and find an empty box. The doctor then dismantled the box and tied it on the leg using the bandage and left him there. He remained there until morning. …. He never got any treatment [for the leg injury] apart from the empty boxes they tied on the leg. I will never forget what he experienced from the referral hospital. It was so bad and so discouraging. Health workers do not care about patients. (Bonesetter patient, male)*

A number of participants recalled community narratives indicating that healthcare workers would intentionally withhold treatment or harm their patients. One woman seeking care at a traditional birth attendant practice describes stories that made her fear that she would be harmed at the hands of healthcare workers:

> *There was a woman in labor who was supposed to be taken to the operating theatre but the nurses asked her for money, which she did not have. They refused to work on her until other patients contributed some money and gave it to the nurses … Those nurses do not mind whether you die from there or not … There is also one mother I heard about who took her child for immunization and got an argument with the nurse. Intentionally the nurse gave the child overdose and the child died. Some of these health workers are so wicked. (Traditional birth attendant patient, female)*

Negative peer testimonies were not limited to patients of healers. For example, one woman seeking biomedical care told a story about her neighbor suffering mistreatment at the same facility.

> *My pregnant neighbor delivered her baby in the village compound. [When they arrived at this hospital for post-partum care], the nurse abused her, saying that she should take her stupidity back to her village. They do not care. (Biomedical patient, female).*

In stark contrast to narratives surrounding biomedical care, peer testimony surrounding traditional healing is largely positive. Healers are lauded for their effective care, and patients are guided by peer testimonials in selecting which healer to visit for their ailments. One participant seeking care at a traditional herbalist describes the impact of peer endorsements on her decision to seek care from this particular healer:

> *This healer is popular and well known, and wherever you go, people will recommend her to treat your sick child … I have seen so many different people come here to receive treatment … I am impressed. (Spiritual healer patient, male).*

A central concept in many testimonies about traditional medicine is the genuineness of the healer, and how they should be set apart from traditional healers who may be "fake" or "quacks". One participant describes how testimonies from peers with similar injuries directed him to seek care from a specific bonesetter, and how testimonies generate more patients for particular healers:

> *Most traditional healers are quacks, and personally I don't trust them.*
> *[Interviewer: Then how do you know that you will heal from this treatment?]*
> *I get the confidence from other people who have been treated here. There is a man from a nearby dairy. He bones were more severely broken than mine, but he healed from here, and is now doing his work. I have heard many people's testimonies that they have been healed from here … When I come here and get healed, I will direct another one because he will be healed too and that person will also direct others… A healer who is real does not need to advertise on the radios because the people they heal create market for them. (Bonesetter patient, male)*

D. Conceptual Model

Figure 1 presents a conceptual model integrating our findings to show how influences at the healthcare provider, healthcare system, and peer levels influence individual engagement with healthcare in pluralistic settings. These variables interact to shape an individual's therapeutic itinerary, but not necessarily in a stepwise manner. For

healthcare users, one or more characteristics of a healthcare system may be of paramount importance in determining use of this resource, but each modality comes with potential disadvantages. Negative experiences could prompt users to switch to the alternate modality. We heard this process described by participants who believed their ailments were initially mismanaged by biomedical providers, and were subsequently healed using traditional approaches. Similarly, positive experiences contribute towards continued use of a healthcare modality, and an individual may become reticent to engage with the alternative in light of continued positive health outcomes.

DISCUSSION

This study identified variables that drive engagement with healthcare resources in a medically pluralistic setting, and identified three central factors that contribute to therapeutic pluralism. These may be summarized as follows: 1) traditional healers care about their patients, while biomedical providers do not; 2) biomedical technologies can provide diagnosis and guide treatment, but these technologies are sometimes intentionally avoided; and 3) peer testimonies influence healthcare utilization, largely in favor of traditional healing. These can be considered conceptually as factors operating at the healthcare provider, healthcare system, and peer levels (Figure 1).

Our work illustrates how healthcare provider characteristics are of central importance to patients. The quality of interpersonal interactions can either motivate or deter engagement with healthcare services. We found that patient-provider interactions with traditional healers are described as generally respectful and supportive, while patient-provider interactions in biomedical contexts included narratives of neglect and “abuse”. These findings align prior work showing that initial choice of therapeutic modality in pluralistic contexts is driven by perceived trustworthiness of a healthcare provider[18,47-50]. Our participant accounts of negative interactions with biomedical staff are congruent with prior work linking negative interactions with disengagement with HIV care among people living with HIV[51-53], decreased HIV pre-exposure prophylaxis (PrEP) utilization among key populations[54] and lack of healthcare facility use among pregnant women[55-57].

We also describe how some characteristics of the available healthcare systems impact healthcare engagement. Our results speak to the hegemony of biomedicine in Uganda, and more broadly throughout post-colonial sub-Saharan Africa, where biomedicine is highly valued, and may be considered of superior quality and efficacy compared with traditional healing[58,59]. Some participants report gaining reassurance through laboratory and radiologic testing to guide diagnosis and therapy, describing this as “proper” treatment. We note that the desire for healthcare directed by “modern” test results is the central factor favoring biomedical healthcare utilization among our participants. Interestingly, other data from high-resource contexts has shown that diagnostic test results do not increase patient reassurance or decrease health-related anxiety in outpatient biomedical settings[60,61]. However, in our medically pluralistic study site, the capacity of biomedical facilities to perform diagnostic testing is distinctive in contrast to traditional medicine approaches, and therefore some patients consider access to testing as a benefit.

Traditional healthcare is sometimes preferred as a means to avoid invasive procedures, such as orthopedic fixation, limb amputation, or Caesarean section. Our findings are congruent with prior research demonstrating avoidance of facility-based obstetric services, preference for traditional home birth[30,57,62], and bonesetters to heal

orthopedic injuries in sub-Saharan Africa[32,63]. Motivation to avoid invasive operative procedures is further explained by poor post-operative outcomes throughout sub-Saharan Africa[64]. For example, maternal mortality after Caesarean section is fifty times higher in Africa compared with high income countries[65]. As such, patients consider invasive biomedical procedures high risk, and seek to avoid them through receipt of traditional therapies.

Additionally, we note that the content of peer testimonies strongly influences patients' decisions to utilize traditional or biomedical care. Peer influences have been shown to have strong impact on individual healthcare engagement in the cases of HIV services utilization[66-68], adolescent health[69,70], mental health[71], and substance misuse[72], for example. Our study shows how peer testimonies serve as endorsements of traditional healing, legitimizing its use through descriptions of clinical effectiveness. In contrast, largely negative narratives regarding biomedicine potentiate avoidance of these facilities and services.

Our findings provide insight on how patients decide to engage with particular healthcare resources, and can guide efforts to improve healthcare quality and interventions in medically pluralistic communities. Importantly, our conceptual model can direct strategies to engage those who may avoid biomedical resources, and have low uptake of conventional healthcare outreach program, which are frequently facility-based, and/or delivered by biomedical providers. Our data suggest that healthcare users value the interpersonal interactions and trustworthiness of healers, but also may gain reassurance through receipt of biomedical testing and diagnostic technologies. An ideal health resource in a pluralistic context would potentially incorporate all of these valuable attributes. Traditional healers in Ghana have taken this approach, utilizing components of biomedical knowledge through reference to medical textbooks and "Google"[73]. Similarly, we know of healers in Mbarara District who use glucometers, blood pressure cuffs, and performed commercially available rapid diagnostics tests for HIV and malaria. Our data suggest that decentralized healthcare services would be highly acceptable among pluralistic communities. An example of his approach at the national health policy level is demonstrated in the case of "differentiated care" for PLHIV[74], where service delivery is tailored to the needs of PLHIV in their communities, and biomedical facility visits are minimized.

Finally, our data contribute to a body of work that emphasizes the important role of traditional healers within the communities they serve. We hope our findings explain the persistent appeal of traditional medicine, and demonstrate that pluralistic behavior should be considered more than 'an inconvenient truth' for biomedical providers, researchers and policy makers. Low biomedical engagement in pluralistic settings should not simply be attributed to lack of access to formal resources, but should be considered an individual's informed healthcare choice. We recommend that researchers and policy makers involve traditional healers when designing and implementing community-based health initiatives because healers are well positioned allies for healthcare programs. Community members may consider healers more trustworthy than biomedical providers[50]. Biomedicine could learn a great deal from healers regarding the power of interpersonal relationships as part of the healthcare process[75,76]. For example, Moshabela et. al. (2016) considered the roles of traditional healers in the context of a community-wide HIV testing and treatment intervention. They found that healers boosted impact and acceptability of the intervention through educating clients on HIV-related stigma and supporting linkage to HIV care[77].

Many studies have shown that healers are interested in working with biomedical providers to improve health outcomes for their patients[23,78,79]. However, the converse is not typically the case. Biomedical objections to traditional healing largely focus on use of alternatively explanatory mechanisms (such as belief that evil spirits or bad luck may cause physical symptoms), lack of standardized training and oversight of practices, and delivery of varying concentrations or mixtures of herbal therapies[80]. In fact, negative attitudes towards traditional medicine have been described as the primary barrier to true collaboration between traditional and biomedicine, as biomedical providers repeatedly downplay the skills and contributions of traditional healers[81,82]. Biomedical providers may express distrust and disapproval of traditional medicine in interactions with their patients[81-83]. Related to this lack of trust is the observation that our participant groups reported markedly different experiences with pluralistic healthcare utilization. Most biomedical participants denied prior use of traditional medicine, while most traditional medicine users reported having previously sought biomedical care. This difference in self-reporting is likely an example of a well described phenomenon, where patients are reticent to disclose traditional medicine use in the context of receiving biomedical care[6,83,84]. Therefore, we suspect that participants seeking care in the biomedical context under-reported traditional medicine use due to fear of social judgement.

There are a few limitations of this study. We acknowledge that baseline characteristics of participants recruited from traditional healer practices are different than those recruited from an outpatient biomedical practice. Qualitative samples are intended to be relevant to the research question, and may not be representative, as would be prioritized in a quantitative study. We did not record medical histories for our participants, and cannot speak to how particular diagnoses may motivate to healthcare itinerary, beyond the symptoms prompting the current visit. This study includes only people seeking healthcare from traditional healers, and similar work is needed for those seeking care from faith healers. Further, we acknowledge the potential impact of social judgement and recognize that some biomedical participants may have been reticent to share positive feelings about traditional medicine during their interviews. Last, our qualitative data indicate multiple directions for future research. For example, what are strategies to facilitate bidirectional cooperation between traditional and biomedical systems? How would one design and implement a decentralized healthcare initiative in cooperation with traditional healers?

CONCLUSIONS

Patients perceive clear advantages and disadvantages to biomedical and traditional care in medically pluralistic settings. We identified factors at the healthcare provider, healthcare system, and peer levels which can influence patients' therapeutic itineraries, and illustrate why traditional medicine is sometimes preferred. Our findings can inform community-based, public health interventions in medically pluralistic contexts, and underscore the importance of recognizing and engaging with traditional healers as important stakeholders in community health.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the work of our research assistants, Patricia Tushemereirwe, Donny Ndazima and Doreen Nabukalu. We also appreciate the thoughtful comments provided by three manuscript reviewers. Finally, we are grateful to

the traditional healers and patients in Mbarara District for sharing their experiences with us.

CONTRIBUTORSHIP STATEMENT

RS conceived of the study. RK and JMA provided input on study design, study procedures. RS and JMA oversaw data collection. RS was primarily responsible for data analysis, with input from JMA, RK and NW. RS composed the first draft of the manuscript. All authors provided input and approve of the final submission.

COMPETING INTERESTS

The authors declare no competing interests.

FUNDING

This study was supported by the National Institutes of Health (K23 MH111409), PI: Sundararajan. RK is supported by the National Institutes of Health (R01 MH109337). The study funder did not have any role in the study design, collection, analysis, interpretation of data, nor in the decision to submit the article for publication. All authors are independent from the funders, and had full access to all of the data. All authors take responsibility for the integrity of the data and accuracy of the data analysis.

DATA SHARING STATEMENT

Deidentified data may be shared upon reasonable request by emailing the first author.

PATIENT AND PUBLIC INVOLVEMENT STATEMENT

Patients were included as participants in this study. They did not directly participate in the design or implementation of the study, as the purpose of the study was to elicit patient perspectives on community healthcare resources. Results of this study were used to guide development of a study community advisory board, which includes patients and other stakeholders, including healthcare providers, traditional healers and community leaders.

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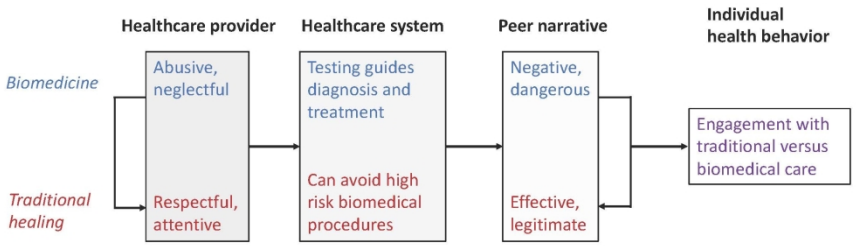
FIGURE CAPTION

Figure 1. Conceptual model showing key factors within various levels (healthcare provider, healthcare system, peer) influencing individual health behavior within medically pluralistic contexts. Each factor differentially influences an individual's therapeutic itinerary. Negative factors may motivate a switch to the other modality, and positive factors contribute towards continued use of a particular healthcare modality. This model is not inclusive of all variables that influence health engagement, but illustrates categories that were described by our participants in driving their healthcare decision making, specifically regarding decisions to utilize traditional or biomedical care.



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338x190mm (200 x 200 DPI)

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	3-4
Purpose or research question - Purpose of the study and specific objectives or questions	4
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	6
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	6
Context - Setting/site and salient contextual factors; rationale**	4-5
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	4-6
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	7
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	5-6
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-7
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-7
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	6

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-12
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-12

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	15

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	16
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	16

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388