

Common Beliefs around Vaginal Illness and Water Quality in Haiti

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Abstract

There is a need for research that explores the perceptions of health concerns from a local perspective, so that where appropriate and deemed necessary, medical interventions and educational initiatives can be effectively designed to respond to public needs, misconceptions, or behavioural practices. Initial pilot needs assessments conducted in the Coastal Ouest region of Haiti alluded to a belief that vaginal illness related to water quality is a major concern among community members. Cultural perceptions of vaginal illness related to water quality were explored with maximum variability sampling among community members and key informants. Participants were selected based on age, gender, socioeconomic status, occupation, and medical training. Beliefs surrounding vaginal illness and water quality were allowed to arise through open-ended, semi-structured interviews conducted with the use of qualified translators. Haitian study participants shared the belief that water is related to vaginal illness, with 81% of Haitian participants expressing the belief that water is a direct cause of vaginal illness. Vaginal illness is a frequent complaint among Haitian women seeking gynaecological care, though very little qualitative research exists on how women seek to prevent or treat these illnesses. The current research indicates that the additional monitoring of shared household water sources used for personal hygiene, in the absence of piped household water, is a potential public health concern related to vaginal illness in Haiti. Further research is needed to determine how public health messaging in the region may influence perceptions of risk and behaviours related to water and personal hygiene.

Keywords: Women's health; Vaginal illness; Haiti; Water; Health perceptions

Introduction

Haiti is a small Caribbean nation which shares the western one third of the Island of Hispaniola with the Dominican Republic. Limited natural resources and industrial development position Haiti as the poorest nation in the Western Hemisphere, with an estimated 80% of the population living in poverty [1]. Infrastructure and municipal services are limited: improved drinking water is available to 57% of the total population, and improved sanitation facilities are available to only 27% of the total population [1]. Water, sanitation, and hygiene (WaSH) initiatives focus on improving access to potable drinking water and sanitation in order to decrease prevalence and incidence of diarrheal disease [2].

Haiti's ministry of health currently has limited mechanisms for monitoring nationwide statistics on gynaecological health other than human immunodeficiency virus (HIV), and more recently cervical cancer. However, irritation, discharge, and itching of the vagina are frequent complaints among women in rural Haiti, with diagnoses ranging from Chlamydia and bacterial vaginosis to candidiasis [3]. Large-scale clinical screening of 10,000 women in Port-au-Prince and Léogâne confirmed earlier estimates that rates of human papillomavirus (HPV) and cervical cancer in Haiti are around the highest in the world [4]. Reports indicate that the prevalence of cervical cancers related to HPV is estimated to be as high as 60.2% in the female population [5].

The prevalence of bacterial vaginosis among symptomatic women in Petit-Goâve, a commune within Léogâne, is as high as 60% [3]. Bacterial vaginosis infection has been linked with increased risk of contracting herpes simplex type 2, *Trichomonas vaginalis*, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and HIV [3]. Full genomic sequencing of drinking water in Haiti's central plateau found a high concentration was *Klebsiella spp* and *E. coli*, both of which have strains known to cause urinary tract infections [6]. Subsequently, gynaecological health in Haiti is a major public health concern that requires further investigation.

As a result of resource availability and behaviour expectations differing widely by social structure and region, culturally accurate definitions of health and illness are an integral part of treatment and intervention. The purpose of this study is to identify the cultural beliefs and current level of knowledge pertaining to vaginal health among community members in the coastal Ouest region of Haiti. Preliminary research indicates that, when prompted in an open-ended manner to indicate major health concerns in their communities, a subset of participants identified poor water quality as causally linked to vaginal illness [7]. Vaginal illness was not defined in the initial exploratory research, nor did it explain how water quality and vaginal illness were related. Therefore, understanding what participants meant when they indicated "vaginal illness" as a major health concern in their area warranted more investigation. Consequently, this study explores the cultural beliefs surrounding how vaginal illnesses are contracted and treated in the coastal Ouest region of Haiti.

Methods

Sampling methods

Translators from Enstiti Travay Sosyal & Syans Sosyal (Institute of Social Work & Social Science) in Delmas, Haiti were used to recruit participants when the potential participants did not speak or feel comfortable speaking in English. Participants were selected using the maximum variability method, and were stratified by age, gender,

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socioeconomic status, occupation, and type of medical training. Maximum variation sampling method seeks consensus among a relatively smaller number of highly diverse participants, because agreement across diverse subsets of the population is indicative of a broadly shared system of cultural belief [8]. Since knowledge is propagated and disseminated by both men and women within the population, it was important to interview participants of both sexes to gain insight into the cultural beliefs and levels of knowledge.

The total sample population (n=44) includes Coastal Ouest Haitian community residents with no previous medical training (n=26) and key informants (n=18), both Haitian and foreign-born who possess some level of medical training. Participants with medical training include Haitian (n=11) and foreign-born (n=7) individuals in the following domains: general practitioners, OBGYN, medical students, nurses, sex education providers, pharmacy students, and individuals who frequently engage with the community as part of medical and education based non-government organizations (NGOs) (Table 1).

Interview structure

Participants were interviewed individually in their homes or at their place of employment depending on preference. Interviews took approximately 30-45 minutes, and were conducted in the individual's native language unless otherwise requested. The semi-structured interviews conducted in Haitian Creole were translated in real time to the researcher and additional probing questions were asked as needed.

Analytical methods

Interviews were transcribed and coded with NVIVO qualitative analysis software and analysed for themes to gain perspective into beliefs and customs surrounding vaginal health and water quality. Researchers conducted the qualitative analysis with a combination of grounded theory [9] and the constant comparative method [10]. Two researchers coded all interviews independently looking for consensus in major themes prior to data analysis.

Data were not weighted by the number of times a participant mentioned a domain, nor were participants with medical training weighted differently than others. Frequency analysis was calculated based on the number of participants who discussed a particular domain, rather than the intensity of the discussion with each participant. All percentages were calculated based on the number of participants that mentioned a particular domain as compared to the total possible participants.

Results

Water

Participants had the highest level of agreement that water was related to vaginal illness. In total, participants identified "unclean water" as related to vaginal illness in n=40 (91%) participants, of which

	Haitian	Foreign-born	Total
Medical doctor	1	1	2
Nursing experience	1	2	3
Medical student	5	N/A	5
Sex education teacher	1	1	2
Medical NGO	2	3	5
Pharmacy training	1	N/A	1
Total	11	7	18

Table 1: Shows the distribution of medical training type among key informant participants.

n=30 (68%) participants stated a belief that unclean water is a direct cause of vaginal illness. However, all Haitian participants, n=37 (100%) shared the belief that unclean water is related to vaginal illness, and n=30 (81%) stated that unclean water is a direct cause of vaginal illness.

Sexual transmission

Sexual transmission was identified as a cause of vaginal illness by n=30 (68%) among all participants, and was the second most frequently stated cause of vaginal illness. The belief that sexual transmission contributed to vaginal illness was evenly distributed throughout the sample population, as stated by n=25 (68%) Haitian participants and n=5 (71%) foreign-born participants.

Hygiene

Hygiene was the third most identified cause of vaginal illness and referenced bathing behaviour, underwear/laundry, and secondary illness. In the overall study population, bathing behaviour was identified as a cause of vaginal illness in n=30 (68%) of all study participants, n=27 (73%) of Haitian participants, and n=3 (43%) of foreign-born participants. Underwear and laundry was identified as a cause of vaginal illness in n=22 (50%) of all participants, n=19 (51%) of Haitian participants, and n=3 (43%) of foreign-born participants. A relatively small subset of the study population (n=5 in total, 3 Haitian participants and 2 foreign-born participants) identified secondary illness, due to scratching the vagina when vaginal irritation is present, as a mechanism for contracting a vaginal illness.

Environment

Environmental factors as a cause of vaginal illness and include latrines, a general unclean environment, urinating on the ground, and dust/dirt. Latrines were discussed as a cause of vaginal illness in n=14 (32%) of all participants and n=13 (35%) of Haitian participants. A general belief that the unclean environment is a cause of vaginal illness was discussed by n=12 (27%) of total participants, n=10 (27%) of Haitian participants and n=2 (29%) of foreign-born participants. Urinating on the ground was identified as a cause of vaginal illness in n=11 (25%) of total participants, n= 10 (27%) of Haitian participants, and n=1 (14%) foreign-born participant. Dust/dirt was identified as a cause of vaginal illness in n=11 (30%) of Haitian participants. Among the 11 participants who mentioned dust/dirt, n=7 (64%) mentioned dust/dirt contaminating underwear as they dried after laundering, and n=4 (36%) stated that infection was caused by dust/dirt coming in contact with the vagina if women urinate on the ground.

Sources

The source of water related to vaginal illness exhibited the lowest level of agreement among participants, with n=17 (39%) interviewees unable or unwilling to identify a specific source of water they believed to be high risk for vaginal illness. Water sources identified by all participants include rivers and streams n=20 (45%), community pumps or water that is trucked in by the government n=8 (18%), wells and ground water n=6 (14%), salt water or water from the ocean n=3 (7%), collected or stored rainwater (n=3), water storage that is open to the air (n=2), and water from pools (n=1). Of those that listed water as a potential source of vaginal illness, n=7 (16%) stated that all water is a potential source of illness unless treated prior to use.

Symptoms

In total, n=38 (86%) participants listed symptoms related to vaginal illness, though none expressed a belief that unique symptoms existed

for vaginal illness related to unclean water. Free listed symptoms included generalized irritation, pain, odour, growths and sores, loss of function, and generalized symptoms. The most frequently identified symptoms across all participants include discharge n=28 (64%), itching n=18 (41%) and n=9 (20%) painful or difficulty urination (Table 2).

Treatment

Of the total study population, n=39 (89%) identified at least one method of treatment. These included antibiotic/doctor recommended medication n=38 (86%), tea leaves/traditional medicine n=12 (27%), sharing medication with friends and family n=5 (11%), and medicine sold by untrained pharmacists on the street n=4 (9%). The desire to seek antibiotic treatment from a physician had a high degree of consensus among study participants, n=38 (86%) and did not differ between Haitian and foreign-born participants (Table 3).

Discussion

Method of contraction

a) **Water:** Semi-structured interviews were used to further explore the cultural definitions and beliefs surrounding vaginal health as it relates to water quality. Water quality, and the potential cultural association to vaginal illness, was allowed to arise initially without prompting in the interviews. If participants did not discuss water in relation to vaginal health on their own, they were prompted to do so at the end of the interview in question 5. A total of n=10 (23%), 5 Haitian and 5 foreign born participants, did not discuss water prior to question 5. When asked directly, n=4 (11%) of Haitian participants stated that they were unsure of whether unclean water was a direct cause of vaginal illness, however none of the Haitian participants expressed that they believed water was not related vaginal illness in some way. Of the seven foreign-born participants interviewed, none identified unclean water as a cause of vaginal illness unprompted. When prompted, five foreign-born participants expressed that they were unsure whether unclean water could be a cause, and two foreign-born participants stated that they did not believe water was a cause of vaginal illness (Figure 1).

b) **Sexual transmission:** Participants discussed a lack of sex

Symptoms	Haitian participants (n=37) n (%)	Foreign-born participants (n=7) n (%)	Total participants (n=44) n (%)
Discharge	23 (62)	5 (71)	28 (64)
Itching	12 (32)	6 (86)	18 (41)
Pain/difficulty urinating	6 (16)	3 (43)	9 (20)
Don't Know/No Response	7 (19)	0 (0)	6 (14)
Secondary illness	3 (8)	2 (29)	5 (11)
	SD=7.85	SD=2.39	SD=9.73

Table 2: Most frequently listed symptoms across sample population.

Method of treatment	Haitian participants (n=37) n (%)	Foreign-born participants (n=7) n (%)	Total participants (n=44) n (%)
Antibiotics	32 (86)	6 (86)	38 (86)
Tea leaves	10 (27)	2 (29)	12 (27)
Sharing medications	4 (11)	1 (14)	5 (11)
Street medications	3 (8)	1 (14)	4 (9)
	SD=9.73	SD=2.38	SD=15.90

Table 3: Most frequently listed methods of treatment across study population.

Question Script:

1. Please list the types of vaginal illnesses women can get in your community?
 2. How do women get each of these vaginal illness in your community?
 3. What are the symptoms of these vaginal illnesses, where in the body do these symptoms occur?
 - a. For each vaginal illness and identified cause: Why do you think that this (identify and discuss each vaginal illness/symptom listed by participant separately) vaginal illness, or symptoms, is related to (cause stated by participant)? Please elaborate.
 4. What are the treatments for these illnesses?
- If water quality has not been mentioned by the participant at this point, then ask the following:*
5. Do you or others you know think water quality may affect vaginal health?
 - a. If participant answers in the affirmative, probe further with:
 - i. How did you hear that water may affect vaginal health?
 - ii. Why do you or why did others think water quality affects vaginal health?
 - iii. What do you or others think is related to vaginal illness: for example, bathing, swimming, drinking etc.?
 - iv. What was the source of that water, (i.e. rivers, ocean, wells, etc.)?

Figure 1: Shows the interview script as it appears in English.

education as a cause of vaginal illness. However, both male and female participants in our study exhibited widespread knowledge of the risk of sexual transmission, and in some cases identified pathogens by name. Haiti was home to the largest number of NGO's per capita in the world even before the 2010 earthquake [11]. However, the city of Léogâne specifically experienced a nearly two-fold increase in healthcare infrastructure since 2010 [12]. Therefore, the volume of NGOs and faith-based organizations operating in close proximity to the study site may account for the higher than anticipated knowledge about women's health among non-medically trained participants (Table 4).

c) **Bathing:** Members of rural communities must often hand carry household water supplies to the home throughout the day, therefore some choose to bathe directly in rivers or streams. Many of our participants reported wearing underwear for modesty when bathing in public settings. Public bathing is a potential risk factor for candida or bacterial vaginitis infection if clothing is worn wet after bathing [13].

The use of wash basins for the storage of bath water in the household may also be a source of transmission for vaginal infection. Participants reported that wash basins were often shared between household members. Participants stated that families with low education and poor access to water might share a single basin of water, sometimes for multiple days. However, no participants identified that they themselves engaged in wash basin sharing behaviour, which indicates further research is needed to determine the prevalence of this behaviour in the general population. Solutions identified by participants to avoid vaginal illness from shared wash basins included using a secondary bucket to partition out water for personal use. However, the fungus responsible for yeast infections, *Candida albicans*, is able to survive on inanimate surfaces for between 1-120 days [14], can grow in standing water even when distilled, and has previously been found in wash basins [15].

Therefore, family wash basins may represent a reservoir for vaginal yeast infections even if participants partition out water for personal hygiene because of the relative hardness of the pathogen.

d) Douching: The practice of douching, forcing water into the vaginal canal, or *twalet deba* as it is referred to in Haitian Creole, is a common practice in Haiti. Research conducted by Seay et al. found that 97% of participants reported engaging in the practice of douching in Haiti [16]. Douching is believed to pose an additional risk of HPV transmission through vaginal tearing associated with dryness [16] or through the disruption of the normal vaginal flora [17]. However, in this research douching was only mentioned by participants in the context of improper bathing techniques, and none of the participants stated that they engaged in the practice personally. Instead, participants stated that water should only be allowed to flow downward and never allowed to enter the vagina. Soap was also not frequently mentioned by participants as a standard part of vaginal bathing practices. When mentioned, soap was described as a risk factor in causing vaginal irritation if not thoroughly rinsed or if strong/scented soaps were used.

e) Hygiene: Vaginal illness was attributed to infrequent laundering of underwear, laundering underwear in unclean/untreated water, and allowing the underwear or vagina to come in contact with dust/dirt. Haitian participants expressed a belief that dust contamination could occur when urinating on the ground or if dust was allowed to collect on underwear after laundering. Some hygiene recommendations may prove unrealistic for Haitians living in rural settings or in poverty. For example, the hot, humid climate restricts the ability to keep underwear from becoming wet from sweat; therefore recommendations of wearing clean, dry underwear may be impractical. Additional cultural barriers to maintaining dry underwear are the practice of rinsing the vagina after toileting, or bathing with undergarments in place for modesty [13].

f) Latrines: Haitians expressed a belief in n=13 (35%) interviews that latrines were a cause of vaginal illness. When probed further the source of the illness was believed to be coming from inside the latrine, often related to a smell or the air inside the latrine immediately following opening the lid, and not associated with sitting on the seat itself. A waiting period of five minutes was believed to be protective between users to allow the perceived contaminant to dissipate. Participants expressed a belief that flush toilets are more hygienic and desirable than latrines; however, access to flush toilets among Haitian participants in

this research was limited (Table 5).

Symptoms

Discharge was described as being white or yellow in colour and was often associated with an odour. Discharge was also described as being similar to a menstrual period, but different in odour and consistency, or as being thick and white with a bad odour and/or “spotted” appearance. Menard et al. found that among Haitian women living in Miami, vaginal secretions were thought to be “dirt” that elevated the risk of infection, and participants stated that menstruation required a 3-day self-prescribed course of antibiotics to restore optimal health [18]. However, research in the Grand’Anse region of Haiti found that self-reported symptoms and presence of vaginal discharge were not correlated to disease diagnosis [19].

Treatment

a) Antibiotics: Antibiotics were discussed as problematic when shared among friends and family members or purchased from street vendors. In five interviews, Haitian participants provided unprompted information on the custom of sharing medication, in which a hypothetical individual would receive treatment for a particular ailment and would later share the medication with a friend or family member who presented with similar symptoms, but had not obtained a specific diagnosis. Medication from street vendors was identified as a risk because these vendors were unable to diagnose specific conditions and rarely provide information on how to use the medication, such as dosage and duration. Furthermore, participants stated that street pharmacists may not be aware of the intended purpose or possible risks associated with the medications they provide.

b) Traditional tea leaves: Boiling medicinal leaves to prepare the tea was the most common form of traditional treatment, and one participant additionally mentioned adding lemon and salt to the tea before washing the vagina with it (Figure 2). The tea is then used to wash the vaginal area or ingested. Medicinal leaves were identified as the following species in Haitian Creole, “Trumpet”, “Aito” (pictured), “Trapongu”, “Pwakongo”, “Mapon”, and “Tibomb”. Only Trumpet leaves were mentioned by multiple participants. Further research is needed to determine the cultural consensus on the names of medicinal plants used to treat vaginal illness and the specific plant species to which they refer.

Strengths and limitations

a) Strengths: A general aim of public health initiatives involves the natural spread, or diffusion, of information through the population. This research provides feedback for current public health dissemination strategies as to how the education on water treatment and purification

	18-25 yrs	26-49 yrs	50+ yrs	Total
High socioeconomic status				
Male	N/A	1	N/A	1
Female	1	1	1	3
Low socioeconomic status				
Male	1	1	1	3
Female	N/A	1	N/A	1
Religious organization				
Male	1	1	1	3
Female	1	1	1	3
Education provider				
Male	1	1	1	3
Female	1	1	1	3
Unemployed				
Male	1	1	1	3
Female	1	1	1	3
Total	8	10	8	26

Table 4: Shows the distribution of non-medical trained community members.

Perceived method of contraction for vaginal infections	Haitian participants (n=37) n (%)	Foreign-born participants (n=7) n (%)	Total participants (n=44) n (%)
Unclean water is related to vaginal illness	37 (100)	3 (7)	40 (91)
Unclean water is a cause of vaginal illness	30 (81)	0 (0)	30 (68)
Sexual Transmission	25 (68)	5 (71)	30 (68)
Bathing Behavior	27 (73)	3 (43)	30 (68)
Underwear/Laundry	19 (22)	3 (43)	19 (51)
	SD=6.62	SD=1.79	SD=7.43

Table 5: Most frequently listed method of contracting vaginal infections across sample population.



Figure 2: *Aïto* is an indigenous plant identified by participants that is used to treat vaginal infections.

is being incorporated and perpetuated by residents of the coastal Ouest region of Haiti. Current cultural perceptions of proper water treatment and storage may be used to inform public health officials on the effectiveness and accuracy of their dissemination strategy. This research is a direct response to concerns voiced by the participants in preliminary focus group interviews regarding vaginal illness and water quality. The semi-structured interview design allowed the cultural beliefs and practices around vaginal health and water quality to arise initially without prompting. The goal was to explore the perceptions of participants without biasing the frequency with which participants made the association between water with vaginal illness. Data from semi-structured interviews are generally richer than survey questionnaires, and the open-ended research design allowed for additional probing of novel concepts mentioned by participants.

b) Limitations: The sample size is relatively small for a traditional public health research study. This research is intended to gain deeper insight into local perceptions of vaginal health and water quality in the coastal region of the Ouest department of Haiti and therefore cannot be generalized to populations elsewhere. Since this research measured perceptions, and did not include clinical testing or diagnosis, this research cannot determine if vaginal illness is occurring or the precise type of vaginal illnesses, if any, are commonly associated with water. Additional research is needed to determine how, if at all, vaginal health may be affected by unclean water. Additionally, the bulk of interviews were conducted with the aid of qualified translators, despite the quality and ability of the translating staff employed in this study, it is likely that some information conveyed by the participants was limited or lost in the translation process. As with all translation, there are nuanced cultural meanings embedded in language that cannot always be converted or conveyed to a non-native speaker.

Conclusion

The purpose of this research was to explore the cultural perceptions of vaginal illness related to water quality in the coastal Ouest region of Haiti. Water, sanitation, and health (WaSH) initiatives in Haiti are focused on access to improved water and sanitation facilities with an emphasis on reducing the prevalence and incidence of diarrheal disease, such as the detection of *Vibrio cholera* [2,20,21], with additional monitoring for *E. coli* [22,23]. This research indicates a high degree of agreement among Haitian participants that water quality is

affecting vaginal health, though the specific pathogens and mechanisms involved require further investigation. The perception that water was related to vaginal illness was shared among Haitian participants across socioeconomic status groups, occupations, the level of medical training, age, gender, and was echoed by individuals in urban and rural areas.

Foreign-born participants demonstrated lower support for this belief, however this finding was expected. Many of the foreign-born participants held positions of western medical authority within the communities in which they interacted. Since foreign-born participants did not demonstrate a shared belief that vaginal illness is related to water, it is unlikely that Haitian participants were responding to what they believed a foreign-born researcher would like to hear. Foreign-born participants were expected to be less culturally competent than Haitian participants and the reflection of this in the data serves to validate the ability of this research to obtain local cultural perceptions of vaginal illness as it relates to water.

Cultural practices surrounding the use of water in vaginal hygiene practices could warrant additional clinical investigation into these perceptions. For example, vaginal douching is prevalent in Haiti and has been associated with increased risk of HPV [16,17]. Practices of storing untreated water used for vaginal washing for multiple days and the sharing of communal washbasins among multiple household members could potentially spread vaginal illness from person to person. However, further research is needed to determine if any specific pathogens might frequently be transmitted through contact with contaminated bathing water. Future research should focus on laboratory testing of household wash basins and identifying the cultural practices associated with water use that may increase risk of interpersonal disease transmission. Additionally, ethnographic research is needed to provide effective education and prevention strategies that incorporate local cultural beliefs, and to determine the extent to which increased public health emphasis on water have potentially shifted the cultural perceptions of water.

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