馬拉威人都不喝水嗎？從飲水習慣切入馬拉威社區非傳染性疾病病人照護議題以及可能的工具性輔助
Malawians Don't Drink Water? Exploring Water Consumption Habits as a potential factor associated with NCDs Care Issues and Potential Supportive Tools for Patient

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Luke International
In Malawi

Motivation

I came up with my research interest after visiting and observing different institutions in Malawi. Originally I want to explore water intake of general population, but later found that this topic can also integrate with Care of NCDs patients Study own by research director of University of Livingstonia (Unilia).

Polio Campaign- visiting rural area

1. Boiling water is not feasible and very dangerous
2. Malawian people seldom drink water

Mzuzu Central hospital- introduction

Pediatric burn injury is the primary cause among pediatric patients

Community development department of LIN

1. No processed drinking water supplied by school
2. Possible contamination in borehole water from latrine
3. Student don't bring water from home

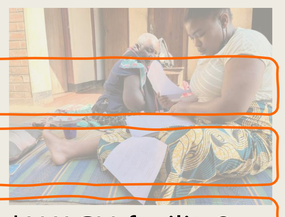
Meeting with Research Director in University of Livingstonia

1. Importance of helpful tools and technologies
2. Barriers toward toilet can result in refusing to eat and drink
3. Dignity of NCDs patients
4. Serious WASH needs

Mzuzu Central hospital- palliative care / medical social worker

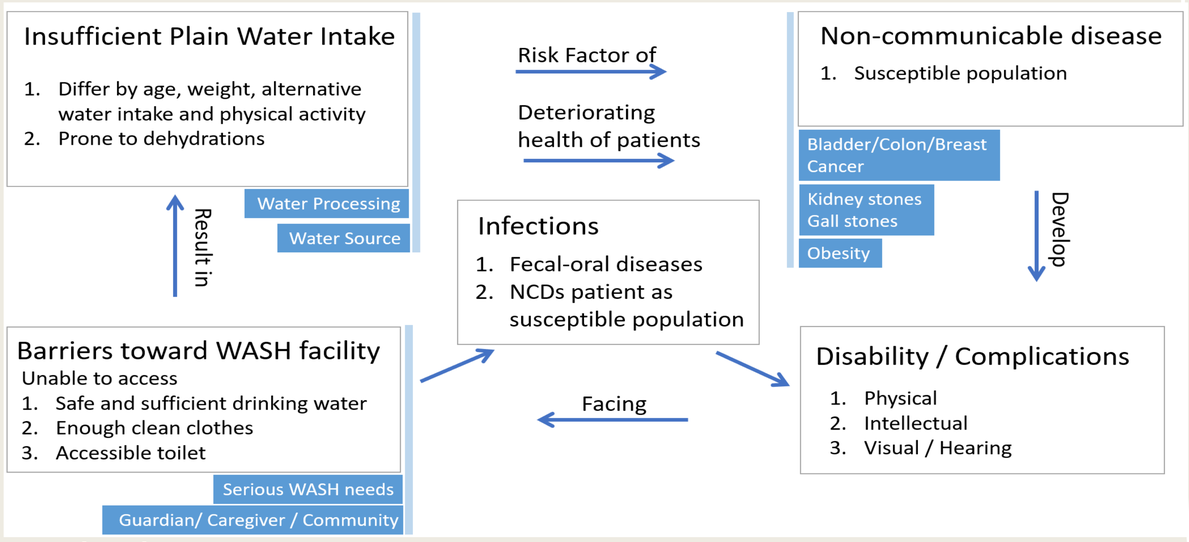
Palliative care provider and medical social worker may offer guardian care education on specific NCDs or link them with tools/technology provider to decrease their barrier toward WASH facility

Research Aims



- Does Malawian people really drink less water?
- Is barrier toward WASH facility the cause?
- Is there any adverse health outcome due to barrier toward WASH facility?
- **How can the situation be improved in the rural context in Malawi?**

The Vicious Cycle



Methods

Sample site and Recruitment

Our target populations are NCDs patients living with complications in Ekwendeni, a northern region in Mzimba district. NCDs patients living with complications in local context refers to patients that are unable to go to NCDs clinic in hospital in person for check-ups due to physical inactivity. We cooperated with nurse Maggie, the only palliative care provider in Ekwendeni Mission Hospital. She is in charge of the follow-up and care for all the NCDs patient in that region. There are a lot of NCDs patients living with complications in the community, Maggie said she was supposed to visit those households to check their conditions and provide hygiene education to the guardians. However due to that hospital lack of funds to buy fuel, she weren't able to visit them. During our recruitment, we drove from one household to another, guided by Maggie. Our target was 15 patients and 15 guardians, a total of 30 participants from 15 households. We eventually recruited 32 participants from 25 households.

Questionnaire

The questionnaire is designed in English and translated into local language- Chitumbuka. It is conducted by 3 data collectors who speak local language. We have a training session for data collectors and did a pre-test in Mapale Hospital for final revision. It took about 45 minutes for each participants to finish the questionnaire in average. The questionnaire adopt mainly quantitative method, supported by qualitative method. The questionnaire consists of: demographic and physiological measurement data, socioeconomic status (SES), NCDs conditions, recent health status (dehydration, waterborne diseases and infections), water intake, water source and water processing, WASH facility (toilet, bathing and clean clothes), improvement of current circumstances, questionnaire of the Barthel index (ADL).

* Combined with Nutrition Questionnaire by 翁咏聖

Obstacles in the Field

1. We originally use MUAC, waist and hip circumstances as an alternative of weight, measured by tools like ribbons. In order to gain insight of patients' nutrition and health status. However, many participants refused any physical measurements.
2. We originally wants to interview a patient and a guardian separately in every household, in order to value patients' perspectives. Since guardian tends to answer most of the questions when interviewed together. However, many patients are unable to finish the questionnaire alone due to poor health condition. We still count questionnaire finished together by patient and guardian as sample patient.
3. Data collectors may explain questions in their own way to help participants better understand them. Due to language barrier, we weren't sure how data collectors interpret the questions until we found evidence of bias in the data.

Result

Characteristics of Samples	
Total Household	25
Patients	18 -
Guardians	14 -
Gender	
Male	11, 44%
Female	14, 56%
Age	
Range (under 7 excluded)	31 -
Mean age (under 7 excluded)	73 -
Under 7 years old	2, 8 %
Income of household per month	
Own agricultural land (No income)	5, 20%
<10 US dollars	5, 20%
10~50 US dollars	8, 32%
50~200 US dollars	7, 28%
NCDs	
Hypertension	15, 60%
Diabetes mellitus	5, 20%
Cardiovascular diseases	17, 68%
Chronic respiratory diseases	4, 16%
Cancer	1, 4 %
Injuries	4, 16%
Sickle cell disease	2, 8 %
Other	3, 12%
Complications	
Eye damage	4, 16%
Hearing problem	1, 4 %
Foot problem	12, 50%
Nerve problem	10, 40%
Infections	2, 8 %
Depression	2, 8 %
Decreased Physical Activity	16, 64%
Body Pain	2, 8 %
Other	2, 8 %
Have at least 2 common symptoms of ____ in past 2 weeks	
Dehydration	9, 36 %
Waterborne Diseases	3, 12 %
Infections	1, 4 %
Daily Plain Water Intake	
<300ml	10, 40%
300~600ml	9, 36%
>600ml	6, 36%
Water Source	
Piped water into dwelling	8, 32%
Piped water to yard/plot	6, 24%
Public tap/standpipe	4, 16%
Tubewell/borehole	3, 12%
Protected dug well	2, 8 %
Unprotected spring	2, 8 %
Treat Drinking Water	
Yes	4, 16%
No	21, 84%
Toilet	
Flush/pour flush	4, 16%
Pit latrine with slab	6, 24%
Pit latrine without slab/open pit	15, 60%
Dependency in ADL (Barthel Index)	
Complete independence	5, 20%
Slight dependence	7, 28%
Severe dependence	9, 36%
Total dependence	4, 16%

A Malawian people really drink less water

Many studies support that drinking sufficient water can lower the risk of several chronic diseases(Martínez García RM, 2022 and etc.), and also help recovery of NCDs. Regardless of age, sex and physical activity, most patients drink much less water than recommended. They don't really take in any extra water from regular diet as well.

Reasons:

Due to complications

1. Physical pain
2. Inconvenience of toilet

Patients who cannot use toilet independently are more likely to drink less water!
p-value = 0.02692
(Fisher's exact test)

By will

1. Habit of drinking a little water only after meal
2. Not thirsty
3. Doesn't want to drink more water

-> Can be improved by proper advocation.

*In the field, we observed that some patients have edema, possibly complication of their diseases. Thus, those cases need to be taken into consideration when advocate drinking more water.

Water Quality:

Most households have safe water source for usage. 70% of the households have water from government water sector and only 2 households have unprotected water source. However, only 4 out of 25 households treat water before drinking it and 3 of them have piped water into dwelling. Meaning that households treat water or not weren't due to difference in water sources but other reasons. Most households knew that diseases transmit through water and don't have difficulties boiling water. Also, more than half of all households think boiling or adding chlorine to the water can prevent transmission of waterborne diseases. The main reason for not treating drinking water is because most people believe water from government water sector is already treated and safe to drink (even borehole is considered safe drinking water source). However contamination in the pipe and water tank is still possible.

A Adverse health outcome

Due to insufficient water intake:

Almost 80% of patients drink less than 600ml per day, and more than half of them shown at least 1 dehydration symptoms. Those who drink more water have a lower rate of developing related symptoms. In addition, 2 patients reported that they didn't defecate for the past 3 weeks, which insufficient water intake may be a possible factor.

Due to WASH facility:

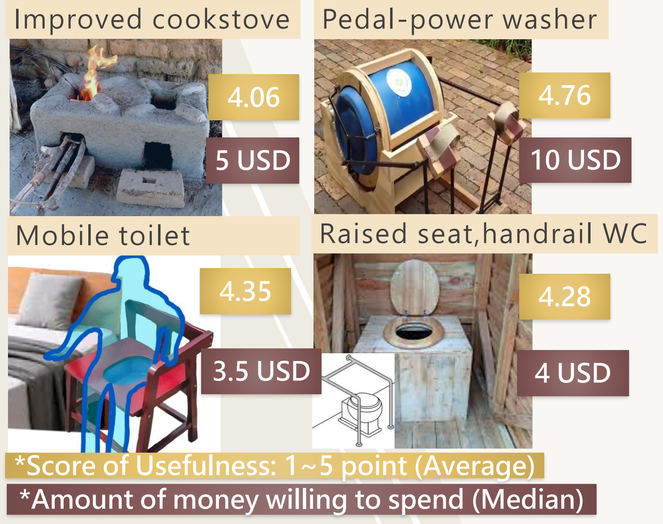
Households that use public accessible toilet or pit latrine without slab has a higher rate of having more symptoms of waterborne diseases and infections (p-value < 0.05).

A Potential Supportive Tools or Methods

Participants talk about their needs:

Category	Detail	Count
Toilet Upgrades		16
Hygiene	Personnel Protective Equipment, Proper body cleaning	2
Nutrition	Balanced and Nutritious diet	6
Water	Drinking water on premise	2
Financial Support		2
Mobility Support	Walker, Wheelchair	3

Participants' thoughts for proposed items:



Pedal-power wash machine is found most useful and has the highest amount willing to pay. 50% of household spend more than an hour washing clothes everyday. This item can help save guardian time and improve patients' hygiene. Improved cookstove is already own by some households and the 2 toilet upgrades may not be feasible for patients without mobility and unable to sit.

Types of toilet upgrades mentioned:

Subject	Desirable Upgrades	Concern
Patient with mobility	Pit latrine with slab	
Patient with mobility but weakness in the lower limb	Toilet with raised seat and handrail	
Patient without mobility but able to sit	Mobile toilet with backrest	Extra burden for guardian
Bedridden patient, unable to sit	diapers	Money consuming

52% of patients needs toilet upgrade now! Also, many patients mentioned the inconvenience of wrong toilet upgrade. For example, a raised seat in the toilet can be more helpful for patients with mobility, since mobile toilet can burden their guardian more. And if a patient can sit, a mobile toilet can be more helpful since diapers are very money consuming.