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RESEARCH ARTICLE

Influencing non-menstruator attitudes and behaviours towards menstrual health among rohingya refugees in Bangladesh: A realist evaluation

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Abstract

Poor menstrual health poses serious public health issues globally, yet half the population are often excluded from the solutions. Men, boys, and those that do not menstruate can have a substantial influence on menstrual health, especially in patriarchal societies and challenging contexts. For example, they can block or facilitate access to essential components of menstrual hygiene management (MHM) or undo or uphold menstrual stigma. This study applies a realist evaluation to a programme aiming to encourage positive attitudes and supportive behaviours towards menstruation among Rohingya non-menstruators in a refugee camp in Bangladesh. The evaluation consists of Key Informant Interviews with nine programme staff, base- and endline survey data with 150 non-menstruators, and 20 in-depth realist interviews with survey participants. The evaluation's theories are framed on levels of the Socio-Ecological Model. On the individual level, we found that it is necessary to aid non-menstruators in understanding and becoming empathetic towards the health risks of poor MHM, recognising their familial responsibilities, and gaining confidence within the role. On the interpersonal level, a motivator for adopting supportive behaviours was perceiving their family to be happy, healthy, and appreciative. On the community level, religious framing - especially delivered by the Imam – influenced viewpoints and removed misconceptions. A motivator on this level was the desire to better the whole community. Negative reactions from neighbours did not have much influence. It was also crucial to create a safe space for everyone to feel comfortable to share and learn together in. Lastly, the organisational level showed the importance of fostering a trustworthy relationship with programme staff and the community menstrual health facilitators. This paper is the first study

considering the research subjects are a vulnerable group (Rohingya refugees from Myanmar living in Bangladesh) and the sensitive nature of the topic (sexual and reproductive health) it would not be ethical to share the data publicly outside of the quotes used in the manuscript. He said with the advances in AI it's becoming easier to identify people from anonymised data. Therefore putting the data in a public repository would breach compliance with the protocol approved by the research ethics board. Nick Sheppard is contactable at N.Sheppard@leeds.ac.uk.

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to demonstrate the contextual factors to establish and mechanisms to seek that influence positive attitudes and supportive behaviours towards menstruation among non-menstruators in humanitarian settings.

Author summary

Menstrual health is not just about access to appropriate materials and facilities but also to healthcare, information, the choice to participate in daily activities, and a supportive environment. A quarter of people who menstruate globally cannot maintain adequate menstrual health. By seeing it as a 'woman's issue', people that do not menstruate (e.g., men and boys) are not thought to be part of the solution. Yet they often play a vital role in inhibiting or promoting access to menstrual health. This is especially the case in strict patriarchal societies and challenging environments like refugee camps. We use the case of the Rohingya community living in Bangladesh to explore how non-menstruators can be influenced to become advocates of menstrual health within the camp. We found many interacting factors that motivated non-menstruators to adopt these roles. Some of these were: understanding and becoming empathetic towards health risks, recognising responsibility, gaining confidence, perceiving their family to be happy, healthy, and appreciative, religious framing, removing misconceptions, desire to better the whole community, feeling safe, and having a trustworthy relationship with programme implementers. Our study provides the first contextually cognisant recommendations on how to influence non-menstruators to become advocates of menstrual health in humanitarian settings.

Introduction

Of the two billion global menstruators, a quarter of them are unable to attain adequate menstrual health [1]. Good menstrual health – meaning access to appropriate materials, water, sanitation and hygiene (WaSH) facilities, healthcare, information, choice to participate in daily activities, and a supportive environment - is essential for the equality, rights, and dignity of all those who menstruate [2,3]. Though attention to the issue has grown considerably in recent years, programmes typically only target the 'practical needs' of those who menstruate, e.g., access to materials and facilities [4]. By excluding the 50% of the population who do not menstruate - and who typically hold more power - these programmes fail to address the strategic needs of menstruators, e.g., those relating to structural inequalities [4]. Non-menstruators can help address inadequate menstrual health through dispelling myths and taboos, offering physical and emotional support, having an influence on menstrual-related policy and decision-making, and promoting gender equality through challenging gender norms [5]. This omission of the critical role non-menstruators play is especially problematic in humanitarian settings where patriarchal structures are more strictly enforced and access to menstrual health is compromised.

The Rohingya refugee community living in Bangladesh offers such an example wherein non-supportive environments, cultural beliefs and practises, stigma, 'peeping toms', a lack of privacy, and fear of sexual violence were found to hinder access to menstrual health [6]. The Rohingya's patriarchal structures result in non-menstruators controlling finances and being responsible for receiving messaging from outside the household, meaning menstrual materials and essential health information are often not passed on to the family [6,7]. Additionally, Rohingya cultural norms, which restrict menstruator mobility and interaction with non-menstruators outside the family, 'significantly limit their chances to access many of the available services' [8].

Though humanitarian guidelines are starting to recognise the influence of non-menstruators on menstrual health, practitioners are failing to involve them due to lack of perceived importance, resources, and 'how to' guidance [9]. Even when programmes do exist, there is a lack of documentation and research into what approaches have been used and their efficacy in different contexts (S1 Table). World Vision and UNICEF affords a suitable programme intending to help Rohingya non-menstruators living in Bangladesh become advocates of menstrual health for their family and wider community for us to provide empirical evidence on how attitudes and behaviours can be changed.

We do this through applying a realist evaluation to explore the causal forces that lead to these changes and how to achieve them based on the context in which the programme transpires. We frame our programme theories using the Socio-Ecological Model, which posits that the individual is influenced by their environment, comprised of multiple levels: the individual, interpersonal, community, and organisational [10]. To interpret our findings we draw on non-menstruator engagement in other programmes, which have shown how they can challenge misconceptions and foster community responsibility in advocating for the rights, health, and safety of those who menstruate for gender- and taboo-related social issues such as by working within the population's ideals of masculinity and pre-existing social systems [11–14]. In this way, we present the first study to provide actionable, contextually cognisant instruction to humanitarian practitioners to influence non-menstruators to become an integral part of advancing menstrual health, what we argue is a vital aspect of gender equity.

Methods

Ethics statement

Ethical approval was gained from the University of Leeds on the 16th March 2023 under reference code MEEC 22–019. Lead author access to Kutupalong Camp was granted by The Government of Bangladesh's Refugee Relief and Repatriation Commissioner on the 21st March 2023. The lead author provided an explanatory statement, consent, and confidentiality form to the World Vision data collection team. The ethical agreement states that 'forms will be written in English, but… spoken verbally to participants in their first language by a translator as necessary'. However, when the ethical agreement was approved, the lead author assumed participants would be able to sign their names on the consent forms. Upon arriving to Bangladesh, the World Vision teams explained that this would not be possible as Rohingya is not a written language. Therefore, the research team followed the protocol World Vision Bangladesh and the Government Office of the Refugee Relief and Repatriation Commissioner employs themselves, which is a verbal explanation of the project, with verbal consent given by participants, witnessed by two or more programme staff and documented on the confidential data collection tools. Participants were also able to bring a friend or family member as a witness if they so wished, as stated in the ethical agreement. For participants under the age of 18, informed consent was obtained from both themselves and their parent/guardian in this same way. All data collected also adhered to World Vision and UNICEF's ethical practise and code of conduct, as illustrated in a Terms of Reference (ToR) written between the parties. Recruitment occurred from April 17–30th 2023.

Rationale for using realist evaluation

The aim of the research was to understand how non-menstruator attitudes and behaviours towards menstruation can be improved based on the context in which the programme takes place. A realist evaluation was conducted as it offers

a comprehensive approach for exploring how and why a programme works in a given context by unearthing the hidden generative causes that lead to change [15,16]. By using a single case study to find these mechanisms and the associated contextual factors necessary to trigger them, the results can be established in other humanitarian settings to achieve the same outcomes.

Environment surrounding the evaluation

The study was on the Rohingya population living in Kutupalong refugee camp, Cox's Bazar, Bangladesh. The camp hosts one million Rohingya; two thirds of the entire population who fled neighbouring Myanmar due to persecution by the Burmese military. Whilst the persecution began in the 1970s, the biggest offence and resultant exodus happened in 2016–17. This site was chosen as it offers a suitable example of a humanitarian organisation engaging non-menstruators in menstrual health where the role of non-menstruators in blocking access to menstrual health is starkly apparent.

The programme to be evaluated

World Vision's main approach was to work with the community to select two menstruators and non-menstruators (two older and two younger) from each sub-block who possessed positive attitudes and behaviours towards menstruation. World Vision then coached them to become advocates for menstrual health among their section of the community to act as 'Menstrual Health (MH) Facilitators'.

Evaluation design

Realist evaluation calls for multiple sources of data and iterations of theory development and testing to uncover the causal forces of a programme's inner workings and the contextual factors that influences them. Since this is too much data to include in one paper, the three main steps are separated into three documents. The first was to develop Initial Programme Theories (IPTs) based on structured interviews with the nine World Vision and UNICEF staff working on the programme. These were conducted in Bangladesh by the lead author, lasted between 30–60 minutes each, were audio recorded and later transcribed by a third party. See S1 Text.

The second step was a quantitative baseline and endline survey with 150 non-menstruators using the Risk-Attitudes-Norms-Ability-Self-regulation (RANAS) approach to behaviour change to discover which psychosocial and contextual factors were determinants of possessing positive attitudes and behaviours towards menstruation among non-menstruators. RANAS is a behaviour change model that has been used to study hygiene behaviours in different contexts, though it has not yet been used to study menstrual behaviours [17–19]. Its constituent parts cover individual-level factors across the following domains: Risk perceptions (how individuals perceive health risks), Attitudes (beliefs about the outcomes of the behaviour), Norms (social influences on behaviour), Abilities (self-efficacy and perceived control over performing the behaviour), and Self-regulation (strategies for planning, monitoring, and maintaining behaviour). As part of this approach, participants were divided into 'doers' and 'non-doers' of the behaviours/attitudes based on the support provided to family, feelings towards carrying out the support, and feelings towards menstruation in general. This is detailed in a separate paper titled 'What influences non-menstruator attitudes and behaviours towards menstruation among Rohingya refugees in Bangladesh? A quantitative analysis' [20].

The final step detailed within this paper was to test the IPTs and unpack the significant factors highlighted in the quantitative analysis by developing realist interview questions for 20 non-menstruators from the 150 survey participants to refine which mechanisms transpired during the programme and why. These lasted 30 minutes each and were conducted by World Vision staff members in Bangladesh, who recorded them using written notes.

Throughout all three steps the Socio-Ecological Model was used as a framework to understand how interventions work within different interacting systems in relation to the individual [10]. It drove the approach to analyse not just how programmes transpire on the individual level, but how they are also influenced by the interpersonal, community, and

organisational levels. Within this paper, the RANAS approach is used in the discussion as a way of interpreting programme theories, largely related to the individual level.

Data collection methods

The initial KIIs with programme staff of step one and part of the quantitative baseline survey of step two were undertaken by the lead author during visits to the camp and an extended stay in the surrounding area in April 2023. However, due to security concerns related to the Bangladesh national election in January 2024, the lead author was unable to re-enter the camp for the endline survey or interviews with non-menstruators for step three. Instead, she conducted a two-hour in-person training with eight World Vision field staff, overseen by one programme manager (and co-author to this paper). The training explained the findings of the quantitative RANAS study, the IPTs, how to conduct realist interviews, and the interview questions. The lead author was able to check the transcribed interviews and provide feedback to the data collectors. The interview questions were reviewed by the lead author's three senior academic supervisors, and World Vision's hygiene promotion and gender equality and social inclusion coordinator, who was able to confirm the guide's contextual relevance and appropriateness. All four are co-authors to this paper. The interview questions were written in English by the lead author, which were verbally translated into Rohingya by the data collectors, with responses given verbally in Rohingya and then translated and written into English by the data collectors in February 2024.

Recruitment process and sampling strategy

Realist thought understands that programmes may work differently for different people based on their demographical make up. Accordingly, 20 interviewees were chosen from the 150 survey participants based on their belonging to each demographical category, including 10 'doers' and 10 'non-doers' of the behaviour, which is outlined in Fig 1:

NO.	DOER/ NON-DOER	BLOCK	AGE	MARITAL STATUS	EDUCATION LEVEL	NO. OF CHILDREN	ARRIVAL IN CAMP
1	Doer	D	22	Single	Illiterate	0	2017
2		D	17		Primary	0	2017
3		F	18		Primary	0	2017
4		C	27		Primary	0	2017
5		C	18		Secondary	0	2017
6		D	34	Married	Illiterate	4	2017
7		B	22		Illiterate	2	2017
8		B	23		Primary	2	2017
9		F	46		Primary	4	>2017
10		F	36		Primary	4	2017
11	Non-doer	B	24	Single	Illiterate	0	2017
12		C	16		Primary	0	2017
13		A	17		Secondary	0	2017
14		E	21		Secondary	0	2017
15		A	49	Married	Illiterate	7	2017
16		F	29		Illiterate	2	2017
17		A	40		Illiterate	9	2017
18		E	23		Primary	0	2017
19		C	24		Primary	2	2017
20		E	38		Secondary	3	2017

Fig 1. Demographics of the 20 non-menstruator Rohingya interviewees.

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Data analysis

The 20 interview transcripts were uploaded into NVivo 14. Transcripts were coded into themes and subthemes related to programme inputs, context, mechanisms, and outcomes. Text within the subthemes was summarised, keeping quotes that related directly to or gave evidence of generative causation to demonstrate in the results section. Mechanisms were broken down into 'resource' – project inputs – and 'reasoning' – how participants respond to the resource giving way to mechanism(resource)-context-mechanism (reasoning)-outcomes (MCMO) configurations following Dalkin et al. [21]. This was used to categorise the summaries into a table of 20 initial MCMO configurations. These were later organised and condensed further into nine MCMO configurations based on overlaps and similarities. These informed the refinement of the programme theories. The analysis of the transcripts was largely retroductive, meaning 'hidden causal forces that lie behind identified patterns or changes in those patterns' were sought [22]. This was done through searching for indicators of feelings that motivated non-menstruators to think or act in a certain way due to programme inputs interacting with contextual factors. They were also inductive, driven by categories and theories that had emerged from the IPTs and RANAS approach. Theories on the lower levels of the Socio-Ecological Model, e.g., Individual were interpreted largely from the RANAS approach as it provides a comprehensive framework for understanding what influences an individual's behaviours based on established psychological and sociological theories. For the higher levels, e.g., Organisational, theories were based on the IPTs from KIIs with programme staff. A depiction of this is found in Fig 3 in the Discussion section.

Limitations and positionality

Some limitations come from the positionality of the lead author. She is White-British, Middle-Class, and non-religious, meaning she is limited when comprehending the nuances of the religious and cultural characteristics of the population studied in this paper. Much of her privilege to be funded and able to conduct research in the international sphere stems from the colonial legacies of the British Empire. This also means that global research, especially in the fields of WaSH and humanitarianism is dominated by Western voices. The three research partners from UNICEF and World Vision who are authors to this paper are Bangladeshi and have been working closely with the Rohingya population since their arrival to Cox's Bazar in 2017. Though possessing many cultural, religious and, linguistic similarities to the Rohingya, they are still outsiders to this population so will possess their own misunderstandings and biases. Thus, the work will contain the subconscious biases of all authors, meaning the mechanisms and what has caused them may not be a completely true depiction of the situation.

As previously outlined, the lead author was not able to re-enter the camp on her second visit for the rest of the data collection due to political turmoil. To spend time in the country of study is invaluable in gaining contextual understandings, which the lead author lost by having a limited amount of time within the Rohingya camp. Though this meant programme staff had to conduct the realist interviews in which they had considerably less training than the lead author, it gave more autonomy to data collectors who knew exceptionally more about the context and population, hopefully providing a greater understanding of the results. A drawback to this however, is that interviewees may have been answering what they thought World Vision colleagues wanted to hear whereas they may have answered more honestly to the lead author as an outsider. This means the programme may not have been quite as effective as what interviewees have claimed it to be.

Realist evaluations are iterative and strengthened when applied to multiple contexts so that direct comparisons can be made. This means they could be infinite when trying to refine theories to be as close to reality as possible. We could have conducted more iterations and collected more data over time to continue refining the theories. With the scope of our research as it is, we have gained a level of understanding of the reality of the situation, but there may have been key mechanisms or contextual factors that we missed or don't have a full picture of.

Behaviour change campaigns often face a reversion of results over time. The timeframe of the research meant we were unable to test this, meaning claims of the effectiveness of the programme may be false and that more should be done to address the longevity of the programme.

With floods, and fires in the camps the project partners were often preoccupied and hassling them with the research project suddenly seemed insignificant. This put delays on the research and their inputs ended up being smaller than we would have wanted. Inputs from various viewpoints are necessary in realist evaluation to create a multi-dimensional and nuanced understanding of the programme and the way it transpires in the context. With a limited input from programme partners, misunderstandings of the situation may have arisen or key components may have been missed.

Results

Here we outline the refined programme theories from the Realist Evaluation. The nine theories are categorised using four levels of the Socio-Ecological Model: Individual, Interpersonal, Community, and Organisational.

Individual

1. *Understanding and becoming empathetic to health risks*

One of the biggest factors people were motivated by to support their family with their menstrual health was their newfound knowledge and awareness of the health risks associated with poor menstrual hygiene management (MHM), especially within the camp context. This also allowed them to understand the critical role they as individuals can play in preventing health issues. Humanitarian contexts provide a unique opportunity for populations to be the subject of programmes, which they would not have encountered had they continued to live in their home country. As this person illustrates, menstrual health and hygiene was not something they were aware of prior to their arrival in Bangladesh, as was the case for most other interviewees:

> *"After my marriage… I know about menstruation… but I only know about menstruation… I [did] not have any idea about Menstrual Hygiene or health. But after [I] came [to] Bangladesh from Myanmar… from meeting organize by… World Vision/MHM facilitator I now [have] knowledge on MH… Meeting and discussion about MHM influenced me about menstruation because… facilitator share example, experience about Menstruation… which I can understand more... After getting influenced from meeting discussion I support my family female member with nutritious food, make sure availability of MHM kit, household level heavy work… my attitude was changed about MHM compared to before but it's not by pressure… only because MH meeting discussion touch my heart I realize importance [of] knowledge… Before… I think it's not [a] matter [of] male concern… I behave… rudely because I did not [understand] menstruation knowledge and their needs… But right now I know why my role is crucial for my family… Risk factor about poor MHM… help me to change [my] view about menstruation… and [give] help to my family member during menstruation."*

Being aware of the health risks and physical and mental symptoms people can experience during their period allowed non-menstruators to become empathetic, which acted as a motivator, as another person articulates:

> *I feel so bad about the negative experiences women face with menstruation. Because this time is a very important time for girls/women… Of course I want to change that.*

The outcomes of understanding the health risks are many. One which staff deemed important that was explored when developing the IPTs was the purchasing of materials. The responses showed that if non-menstruators can understand the importance appropriate materials play in their family's menstrual health and become used to handling them through the programme, then they would be motivated and more comfortable to buy them for their families:

> *If [MHM kit] distribution [stops] I will buy reusable cloth. They need to wash, dry and preserve it safely… I know the risk factor if my family female member did not follow MHM practice it will lead [to] itching, germ, infection'*

Summary box 1. Understanding and empathy to risk

PROGRAMME THEORY: IF the intervention demonstrates the risk poor MHM has to menstruators' mental and physical health – especially within the camp context - THEN they will become cognisant and empathetic of the threat to health, negative symptoms of menstruation, and the role they can play in ameliorating this, leading them to support their family with their menstrual health.

CONTEXT: Non-menstruators were largely unaware of the risks poor menstrual health has to their family members, which is exacerbated living in the camp.

MECHANISM: World Vision implemented information sessions hosted by themselves and trained community MH facilitators using discussions and examples (resource) which helped non-menstruators understand and become empathetic to the health risks associated with poor MH (reasoning).

OUTCOME: Non-menstruators act to support their family in MHM

2. *Recognising responsibility*

Many non-menstruators reported realising it was their duty to support menstruating family members and the importance of this role through World Vision's intervention. There was also a recognition and appreciation of the role their menstruating spouses play in supporting the family, which added to the feeling of needing to parallel their inputs. One person illustrates:

> *Previously my mother was feel sick in menstruation time but that time I have no knowledge on importance of support to women in menstruation time. After the participation in MH activity with World Vision then I understand about necessity of male support and how is their expectation… I was influenced by WV session and trying to support my mother… and I got a well feedback... According to our special care… my mother feel very healthy physically and mentally.*

Others talked about there being a duty of non-menstruators to support their families in this way:

> *I do not feel ashamed to help my mother and sister during menstruation. It is my responsibility and duty. My family is happy. Every man should perform his duties during menstruation. It is obligatory to do that… It has been so much better for my family and the committee to learn [from] World Vision. Some of my habits have changed, and those who have bad habits need to sit together and discuss MHM in detail.*

Another talks about their lifelong commitment to supporting their family in this way, viewing it as a way of protecting their family's rights:

> *For as long as I live, I support my family. I believe that by doing so, I am protecting my wife's and daughter's rights.*

Others spoke of the appreciation of the role the female head of household plays, which influences them to take care of her during menstruation:

> *My wife is the maker in our family and she is more committed to care [for] every family member. In menstruation time she feels sick… This time she expects special care from us. According to her expectation, I am committed to support her for happiness and good health.*

Another ponders how their family relies on him in that if he did not support them, there would not be anyone else to:

> *I feel commitment about MHM because… If I do not support, whom will support my family member?*

Summary box 2. Recognising responsibility

PROGRAMME THEORY*:* IF the intervention demonstrates the role non-menstruators can play in the family to support their dignity and rights, THEN they will see it as their responsibility to support them in a way no one else can.

CONTEXT*:* Due to the secrecy of menstruation, non-menstruators were not aware of the role they could play in supporting their menstruating family members. Typically, menstruators work to care for the family rather than non-menstruators.

MECHANISM*:* The MH activities, which demonstrated examples of how non-menstruators could support their menstruating family members both with MHM and with household tasks (resource), helped non-menstruators discover a sense of duty in their role (reasoning). Recognition of how hard menstruators work to support the family was also an influencing contextual factor.

OUTCOME*:* Non-menstruators play their role in the family to ensure their physical and mental health.

3. *Gaining confidence in role*

Most people reported that the MH sessions increased their confidence in their ability to pass on helpful information and perform supportive tasks for their family members:

> *WV volunteer increase my self-ability to support my family during menstruation. They develop my confidence level [in] how to support my family. They discuss about the benefit of male engagement with positive approach.*

Others reported that their confidence also comes from family and friends and suggest other ways to increase confidence:

> *My confidence about MHM comes from family, friends, and meetings with various organizations. It would have been better to show pictures of the current practice of having sessions with MHM related male to increase confidence.*

Not only is know-how important in increasing confidence, but also having the resources available to ensure their families can perform good MHM:

> *World Vision supplying pure water for community and improving sanitation system for our better health. Water is very essential to maintain our personal hygiene and family hygiene. [With] the availability of water, our women clean her menstruation cloths.*

Summary box 3. Confidence

PROGRAMME THEORY*:* IF non-menstruators gain how-to knowledge, experience, encouragement from staff, peers and family, and having materials and water available to allow family to perform MHM, THEN they will become more confident to perform the supportive tasks. Other inputs that non-menstruators claimed gave them the confidence to support their family was empathy, becoming aware of responsibilities, information from books and pictures, and group discussion.

CONTEXT*:* Non-menstruators are not aware or practised in the activities necessary to support their family during menstruation.

MECHANISM*:* World Vision provides training and demonstration sessions (resource) which increases non-menstruator confidence in their ability to support their family (reasoning). WV also provides WaSH facilities so that menstruators are able to carry out proper MHM (resource).

OUTCOME*:* Non-menstruators practise the behaviours of supporting their family with continual gained confidence.

Interpersonal

4. *Reaction from family*

Many reported a positive reaction from family members such as seeing them happy, peaceful, comfortable, and relaxed. They also witnessed their family benefitting from the support and showing gratitude, all of which acted as encouragement for continuing the behaviours. Following are a selection of quotes to illustrate:

> *They feel pleasure to me. My mother appreciates me when I helped my wife during menstruation. When I support my wife she looks at me and smiles. Then I realised that she liked my help.*
>
> *My family female member share gratitude and honour to me that I support them during menstruation period… I always feel proud to make their menstruation easy.*
>
> *If I support my family during menstruation I feel proud and my family member appreciate my approach about menstruation support… I support my family member [to] stay healthy and safe, which make them much more confident [with] MHM. Also they encourage me about MHM support commitment.*

Some talked about how it is sometimes not possible to talk about menstruation with all family members and how attitudes and reactions change over time:

> *My mother she is not feel comfort to discuss with me regarding menstruation. She feels shame to talk with me. I am not comfort to talk with her. It's a major barrier for me and my mother. If World Vision Volunteers able to work on the issue, break the taboo from society, it will be very helpful [for the] community… Rohingya women… feel very shame to talk [about] her personal issue with male person. For [this] reason we… need [to] special take care of her health… When I support…my family member during menstruation time then [they] are encouraging me. Once upon a time if males are support to his wife then others people are discouraging me but now they are change their thinking now they are appreciating me.*

Summary box 4. Reaction from family

PROGRAMME THEORY*:* IF the family show they are happy and comfortable with the help they are given THEN non-menstruators will feel proud, altruistic, and happy to see their family healthy and therefore be encouraged to continue the support.

CONTEXT*:* Most menstruators appreciate the support from their non-menstruating family members, though some still feel shy or are impacted by stigmas which are hard to overcome so do not engage.

MECHANISM*:* If WV is able to break taboos with all genders (resource) menstruators may show encouragement to their non-menstruating family, creating a sense of pride and inspiration to continue to support them (reasoning). Additionally if non-menstruators are able to see how their support is benefitting their family's wellbeing they are encouraged to continue (reasoning).

OUTCOME*:* Non-menstruators continue to support their menstruating family members, allowing them to feel supported and appreciative.

Community

5. *Removing misconceptions through religious thought*

In this setting, there were many misconceptions and aversions to menstruation such that it was a '*curse from Satan',* a disease, or only a '*female issue'*. Since the community is devoutly Muslim, if the Imam is able to explain that menstruation is natural, necessary for reproduction, or 'God-gifted' it helps to remove misconceptions and for people to see that it is something positive that concerns the wellbeing and longevity of the family and community. One person illustrates the issue of menstruation being perceived as only a female concern:

> *Sometimes [there are] problems there, example: social superstition. Male are not interested… about MHM. Their thinking is that it is only for female issues. We [community members] are trying to change them by World vision staff or volunteer… Earlier many people took it badly, but now all women share all issues with their responsible person, so now I think a lot has changed.*

Another explains how they can understand menstruation from the idea of Creation:

> *Since creation, women have been made like this by Allah, I can understand from there. My self-confidence is coming through reading, seeing and hearing directly.*

Therefore, community members feel that

> *It is better to have a meeting with the Imam and the Majhi (community camp leader) at camp level to increase commitment regarding menstruation.*

Another community member goes on to explain a little further

> *The program activity work for every community people. Every[one] engage in this meeting and gather their knowledge and misconception will [be] removed… We have had a lot of cooperation... I feel good [about] initiative WV to create a MHM male facilitator who have to work [with] community… to support their family members. They… engage community people and removed misconception in MH… WV Volunteer and MHM male facilitator helps us to change our opinion. They are always arrange meeting together in MH activity and be aware of our community people. When I realized it was given by Allah, my opinion changed and I strive to support our family members…our ideas/things have changed.*

One person even feels that because menstruation is a gift from Allah, there is more reason that menstruators should have a positive menstrual experience where they are able to stay hygienic and free from being teased or shamed:

If negative experience faced by female I feel bad for it because menstruation is [a] god-gifted and natural matter so female should need to stay neat and clean during menstruation time so during this time [if] anyone teases or shames any female it should not [be] acceptable.

Summary box 5. Removing misconceptions through religious thought

PROGRAMME THEORY*:* IF the intervention is able to remove misconceptions that menstruation is a natural phenomenon free from superstition or evil but a gift from God THEN non-menstruators will see it not just as a women's issue but something important that the community needs to support altogether.

CONTEXT*:* There is stigma, misconceptions, taboo, and beliefs that menstruation is only a women's issue. The community is Muslim and the Imam has a lot of influence.

MECHANISM*:* Through speaking with the Imam or explanations that menstruation is a natural and God-gifted issue (resource) non-menstruators are able to change their perceptions and see it as something important to everyone and even sacred (reasoning).

OUTCOME*:* Non-menstruators develop a positive outlook on menstruation and view it as a reason to help and protect menstruators from negative experiences.

6. *Bettering whole community*

The non-menstruators recognise that not only is it important that their menstrual knowledge can be used to inform their menstruating family members, but also to influence other non-menstruators for the overall health of the community. Additionally some give an appreciation that World Vision works to better the health and wellbeing of the community, which encourages them to do the same as evident here:

I like to work for the good of the nation, no doubt it is a very good work, so I do it. People should understand the benefits and losses well… when I know that it will be good for us, since then my interest to do this work has increased a lot… Our society is not well aware of MHM, I have more learned [from] World vision and motivated by MHM issues, I have [become] more committed for change my community… World Vision has done so much for our community and has been able to inform us about menstruation. Their good advice helps us stay healthy all the time, so I am spontaneously working with MHM on my own accord.

Others speak of the knock-on effect of their messages being passed on from their family members to other menstruators:

I want to participant in World Vision activities for my better learning about MH. After the session we should share the message with our family members, neighbours, and friends how they give an opportunity to change their attitude and opinion about menstruation... Once upon a time I had no knowledge on menstruation but when I started to participate with WV activities… I gain knowledge on hygiene management and increase my self-ability to disseminate the message with others… I feel very comfort to talk or discuss with my wife and friends about MH. My wife she also very comfort to share her challenges about menstruation. If [I] share this message with my wife, then my wife also shares this information with other women. Me and friends are same age; as [a] result we openly discuss regarding the issue... I aware to friends to support his wife and other family member in menstruation time.

One participate posits that to see positive change in their family and the community they have to start by changing themself:

> *If I change myself, my family will change. Besides, others will learn from me.*

Others talk about how important the influence of non-menstruator family members have been to them in changing their opinions about menstruation:

> *I was influenced by my elder brother-in-law to change my attitude. From my childhood, I observed my brother-in-law… supporting my sister in household activities and take her special care during menstruation time… When I was adolescent that time I saw my father was helped my mother in household activities and he took her special care when she feels sick. My father is my real influencer to change my opinions and thoughts about menstruation.*

Another point people made was the feeling that everyone in the society should learn about menstruation whether unmarried or married as it is a cultural norm for everyone to get married at eventually:

> *I feel comfortable to talk about MHM with my male friend especially whom are unmarried because they need known for their further married life wife support cause Rohingya camp wife are defended on husband, so husband should provide full support and assistance to his wife.*

Lastly, one person makes the point that by seeing all WV staff working together respectfully, the community are influenced to work together too:

> *They work together with manner, which influence community people to work together.*

Summary box 6. Bettering whole community

PROGRAMME THEORY: IF the intervention and World Vision focuses on everyone working towards the greater good of the community as a whole, THEN non-menstruators will appreciate their role in influencing other community members and be prepared to support their family even before starting one.

CONTEXT: The Rohingya are living in a camp in close proximity to one another where there is a sense of community. It is typical for everyone to get married and have children.

MECHANISM: By demonstrating the benefits of good menstrual health and seeing World Vision staff work together for the good of the community (resource) non-menstruators reason that all community members should work together to better the community as a whole (reasoning).

OUTCOME: Non-menstruators take it upon themselves to disseminate menstrual knowledge to other community members.

7. *Creating a safe space*

Participants felt World Vision did well to create safe spaces that encouraged people to attend and share freely:

They respect our culture. They didn't force any community people to attend their activities. They conduct their meeting at safe place like household… They know about all the community peoples… They visit the household and try to find out the household, which is safe for conducting a meeting… Safety issues didn't prevent me from attending activities. I think people show interest to attending their activities because they creates a safe place where everyone can share their challenges and opinion.

Most people said they were most comfortable to talk with family, friends, neighbours, and people of the same age group, which was respected when splitting the MH sessions:

I feel more comfortable to discuss menstruation related topic with the people of my same age. Because I can… share everything to them without any hesitation. When an old age people talk with me about menstruation, I feel shy.

It seemed that interviewees had different interpretations of what is meant by a safe space. This person feels that by everyone becoming used to discussing menstruation together, a safe space is created:

WV/facilitator create a suitable safe environment for MHM, that's why community talked about MHM. It was tough [to] create a safe environment for MH discussion because first time people are laughed, feel shy about discuss this issue. WV address it is for public health issue concern. By regular household visit they tell us it is very needful topic for us that's why right now I feel more comfortable safe environment was created for MH meeting and discussion… Not safety issue prevent because right now we discuss MHM as like regular discussion and attitude.

Most participants mentioned how it was necessary to split sessions by age and especially by sex. Many people reported wanting to split into groups with the same-aged people and those they were familiar with. Since many of the Rohingya follow Sharia Law – it is necessary for males and females to be separate during meetings. They valued that WV respected their culture by having meetings segregated in this way as summarised in one participant's statement:

According to the religious views, women and men are [not] working together but World Vision staffs are working equally for effective communication in block level. Regarding the policy staffs/Volunteers are able to get easy access to open discussion with their same gender. For this opportunity volunteers… easily find out the challenges and take appropriate initiative to mitigate the challenges… Volunteer inviting me to participate in session with my same gender and same age group. As a result, every participant is freely express their opinions and thoughts regarding menstruation… I never feel any kind of challenges to attend in session.

As an additional note, some appreciated seeing World Vision staff of different genders working together and even postulated this might be something of benefit they would like the community to work towards:

They respect us a lot, they do what we want. But men and woman working together is not tolerated in our society. We are slowly trying to get out of it… We love it when World Vision girls and boys work together, we also want to work together. No one will accept it so easily. Society has to change slowly.

Summary box 7. Creating a safe space

PROGRAMME THEORY*:* IF the meetings are organised in a convenient time, location, split by age group and gender, with friends and neighbours THEN everyone feels respected, and comfortable to attend, discuss, and share freely.

CONTEXT: Living in the camp poses some safety issues. Sharia Law means sexes should be segregated. The majority are most comfortable to talk with family, friends, neighbours, and people of the same age group and sex.

MECHANISM: World Vision creates a safe space by picking a secure household location, segregating groups by sex, age, and neighbours (resource), which makes participants feel safe, comfortable, and respected (reasoning).

OUTCOME: Everyone is able to share freely. The relationship with World Vision is preserved by having their culture respected. Ideas about different genders working together is contemplated.

8. *Reactions from neighbours*

Many described having a strong emotional response to any negative actions community members might take towards their menstruating family members. Some even described how they would rectify such acts:

> *If our sisters or wives are facing any kind negative experience from our… community person, we feel very sad and angry to the person… First time we give a space to him for his self-correction. It he does not change his behaviour we need to take a strong decision against him, as well as we need to establish [an] act for his punishment.*

Some describe their neighbours' reaction as being a barrier to them supporting their family with their menstruation:

> *Surrounding community thinking about MHM is barrier for support my family for menstruation. Some people said like "You are male person why you are support your female member regarding menstruation? Also why you need to know about menstruation? It's embarrassing!"*

Whereas others are encouraged by their neighbours

> *When I support to my wife in menstruation time all my family members are encourage me. When other person is seeing that, they also encourage me for this great work.*

And some are able to take it as an opportunity to educate those with negative attitudes:

> *I found barrier like surrounding people sometime tease me like why you support your family female member why you need to support but instant I replay with proper explanation and share my knowledge about MHM and why it [is] needed.*

Summary box 8. Reaction from neighbours

PROGRAMME THEORY: IF the intervention encourages a sense of integrity and justice among non-menstruators THEN when community members shame or tease menstruators for menstruating or non-menstruators for supporting and discussing menstruation, they will stand up to them and help them understand why it's important.

CONTEXT: Some neighbours have a negative response to those who menstruate or non-menstruators who try and talk about menstruation.

MECHANISM: If non-menstruators are provided with a strong sense of why it is important and necessary to discuss menstruation and support or defend menstruators (resource), integrity and justice are instilled (reasoning).

OUTCOME: Non-menstruators stand up to neighbours who are shaming people about menstruation or talking about menstruation and try to demonstrate why it's important to discuss openly.

Organisational

9. *Relationship with World Vision/MH facilitators*

Participants had many positive things to say about World Vision. The first is about how they took time to respectfully invite non-menstruators to participate in the campaign:

> *WV never showing disrespect to our community beliefs and social norms. When WV staffs/Volunteers… invite us to participate with a session they calling us Bhai (brother) and show proper respect to every participant… Before conducting the session World Vision Volunteers/staffs… visit our household and invite us with proper respect. Before the starting of session, they giving thanks for the participation. They give equal respect for every participant.*

Coming from different cultural backgrounds, the community touched on the importance of respecting their culture in particular:

> *World Vision every staffs and volunteers are showing mutual respect to every participant. They never disrespect to our culture, social norms and religious norms… World Vision showing equal respect and ensure dignity to participants… World Vision Staffs and Volunteers never pressure to change our attitude and opinions. They respect our opinion and attitude.*

Others talk about how World Vision understands the right the community has to choose what is best for them:

> *I don't feel any pressure to attending with WV. They never forced us to change my behaviour. They always motivated us how to change our habit. How we support each and other, how we utilize the facility. They influence us about the benefit and hinder of good/bad practice. Community has right to choose the best things which is appropriate for her/his family wellbeing.*

Some talked about how they are given enough time to ponder the new information at their leisure:

> *No pressure from the program. They… take time to learn MH activities. We also contemplate in our own time about MH activity how to help and maintain this.*

One more discusses how World Vision are reliably present whenever the community needs it:

> *They do not force us in any way, they work for our good, there any time support for us.*

The majority of people asked for the frequency of meetings to increase to gain more knowledge, which in turn improves attitudes towards menstruation:

> *If world vision volunteer and staff conduct meeting regularly may we gain more knowledge about menstruation, which improve my opinion towards menstruation.*

Many requested that this be done through individual meetings at the household level:

> *Hygiene promotion volunteers visited the household one or two times per week. When they visit household, they inspired us about supporting the family during menstruation.*

Additionally, a few described how the frequency of meetings not only bolsters their confidence in knowledge but also their relationship to World Vision:

> *Since we are less educated person it is better if you… arrange more training and meetings… They (World Vision/MH volunteers)… share their knowledge about MH activities, which is good for us. They… always influenced us to participate [in] their regular activity… They are visit our household in regular and support to us when I faced problem. It helps to maintain good relation… Through you teaching more, we have learned more menstruation and have a clear understanding of things.*

Lastly, one person also notes that their good relationship with World Vision has improved their relationship with their family:

> *I have developed a much better relationship with World Vision since I started doing so many MHM sessions. This has led to a much deeper relationship with my family and wife. It has benefited me a thousand fold.*

Summary box 9. Relationship with world Vision and MH facilitators

PROGRAMME THEORY: If World Vision/MH volunteers meet with the community regularly to gently encourage attitudes and behaviours, without forcing them come to sessions, whilst respecting their culture and having a good, familiar relationship where they are perceived as benefitting the community, THEN non-menstruators participate in regular sessions, contemplate mentality changes in their own time, and absorb lessons.

CONTEXT: WV staff and the Rohingya come from similar, yet different cultural backgrounds. They have been working with the community since the start of the main influx in 2017. There is a natural power hierarchy between NGO and participant that World Vision recognises and does not abuse.

MECHANISM: World Vision works to respect and understand culture and act in an encouraging way which does not force or impose views, wherein the community are left to change or ponder the lessons in their own way and time with regular check ins (resource) meaning participants are happy to take part and take the teachings seriously (reasoning).

OUTCOME: Non-menstruators are able to participate and absorb World Vision's lessons whilst their relationship with WV continues to grow.

These programme theories are summarised in Fig 2, which depicts the nine MCMOs found in the evaluation, with contextual factors being split into 'community' and 'organisational'.

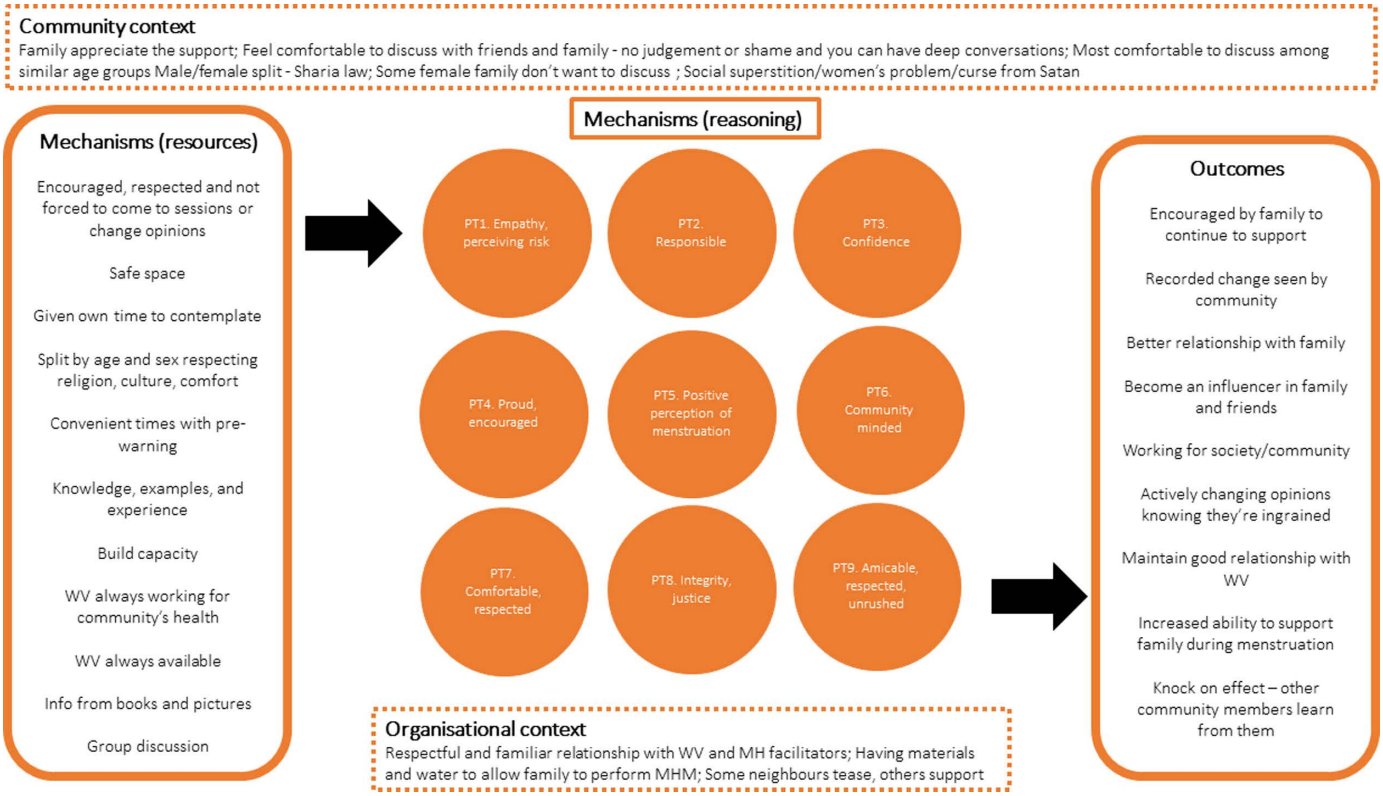

Fig 2. Summary of refined programme theories within context-mechanism-outcome configurations.

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Discussion

The refined programme theories are categorised into four levels of the Socio-Ecological Model, which will structure the discussion. On the individual level, the mechanisms related to understanding and becoming empathetic to health risks, recognising responsibility, and gaining confidence in the role. On the interpersonal level, reaction from family was a motivator for continuing the supportive behaviours. At the community level mechanisms related to removing misconceptions, focusing on bettering the whole community, creating a safe space, and reactions from neighbours. And on the organisational level the important factor was the relationship with World Vision. Since there is no literature on the mechanisms associated with engaging non-menstruators in menstrual health, each PT is compared with literature from other, gender equity-related programmes such as engaging non-menstruators in intimate partner violence, and reproductive health. We also reference findings from the RANAS analysis and IPTs, with Fig 3 illustrating how they relate to the refined programme theories. As will be demonstrated, RANAS brought in more theories related to individual characteristics yet the KIIs with programme staff showed the importance of organisational factors. This demonstrates the benefit of using multiple sources of data and using the Socio-Ecological Model as a framework as they both encouraged the development of PTs on various interacting levels.

Individual

At the individual level, the important mechanisms we saw were a gain in knowledge, confidence, and a sense of responsibility. Though each programme theory was delineated into nine separate categories, many of them were overlapping and interrelating. For example, an increase in knowledge created an awareness of responsibilities, and a gain in confidence

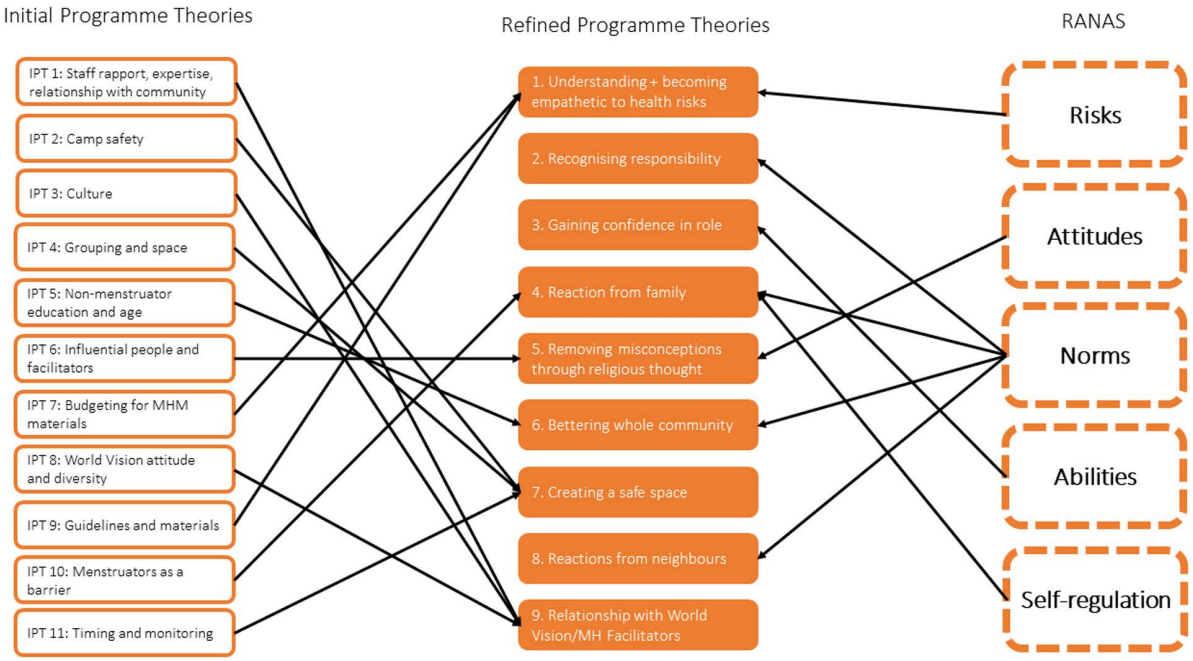

Fig 3. How initial programme theories and RANAS elements relate to and inform refined programme theories.

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gave the assurance to accept and carry them out. Here we unpack those factors in relation to their corresponding RANAS components: Risk, Norms, and Ability.

A key component of the RANAS model suggests perception of risk as a motivator for behaviour change. This is evident in this study as most reported becoming aware of the health risks as a large driver for adopting the supportive behaviours. The RANAS approach usually considers the perception of risk to one's own health. However, in this case it was the health risk to one's family, demonstrating an element of empathy to be driving the motivator. This is similar to a realist review on batterer intervention programmes where developing empathy for their partners was also an important mechanism for changing behaviours. They explain that 'provision of knowledge alone is not enough. The process is more complex: Something needs to change internally within a participant (the mechanism) for that knowledge to result in a shift in beliefs or attitudes, acceptance of responsibility, or feelings of empathy' [23].

A Norm factor in the RANAS approach is an individual's perception of their role in carrying out the behaviour. Many participants reported feeling a sense of duty within the family to protect them from becoming ill and supporting them mentally and physically. There was also recognition that their menstruator family members work hard to support the family most of the time, demonstrating a desire to mirror their inputs. For some of the mechanisms, there was not necessarily a resource component but rather causal forces that happened organically based on the 'pre-existing context of action and related mechanisms that may be operating within it' [24]. As per the methodological discussion introduced by Pawson and Manzano-Santaella, de Souza adds that 'duties/responsibilities relate primarily to the roles and accompanying responsibilities and expectations that are assigned to individuals within a pre-existing social system' [16,24]. For example, in this programme, there were varied components to the desired behaviours: supporting menstruators with household tasks if they are experiencing debilitating symptoms, providing MHM guidance, giving emotional support and understanding, and more widely undoing menstrual stigma within the community. However, in the RANAS analysis, many reported feeling a sense of duty to support their family, but not necessarily for reducing menstrual stigma in the community. In this way,

organisations can work with pre-existing ideas around a population's sense of duty and responsibility to understand which tasks they may adopt more naturally and which need attention.

Another aspect of RANAS is Ability; the confidence one has to carry out and maintain a behaviour. The non-menstruators reported feeling confident largely due to their increased knowledge, and being able to pass on that knowledge. Though hearing examples and stories from World Vision and the MH facilitators was reported to be effective, what they felt was lacking was story books with images to explain in detail the many varied ways in which they could support their family/improve menstrual health in the community. World Vision staff suggested that this could be co-created with the community and distributed throughout the camps entirety. Confidence may not only refer to their knowledge and ability to share accurate and helpful information but also their confidence to discuss a topic which may cause embarrassment, as described in the 2010 study looking at a UK-wide initiative raising parents' confidence and ability to talk about sex and relationships with their children [16]. The confidence parents gained through the study not only encouraged and allowed them to initiate and provide useful and in-depth conversations with their children, it also gave the children comfort and confidence in knowing that they could revisit the conversation and ask follow up questions later. In another study looking at male involvement in a programme to reduce child maltreatment and gender based violence, fathers became 'key figures and role models who built their self-confidence' as described by their daughters [13]. This leads us on to our next Socio-Ecological Model level: The Interpersonal.

Interpersonal

The reaction from family members was a big motivator for acting out the behaviours; both through the words of encouragement their family gave as well as seeing their physical and emotional wellbeing improve first-hand. A study looking at the role of non-menstruators in community MHM in India, found similar results with one participant observing how with their support, 'my family are safe, healthy and above all can exercise their reproductive health rights merrily without any conjecture of apprehension or stigma in their heart' [25]. However, in our study, a positive reaction from menstruators was not always found, as predicted in the IPTs developed from interviews with programme staff. Participants reported that some family members – mainly their mothers - would refuse to discuss menstruation with them.

There are many instances in development work where only one sex is engaged in changing behaviours, which poses limitations [26,27]. For example, menstruators are often targeted in nutritional training schemes. However, if non-menstruators are excluded from the training they may not understand the need for a new diet and refuse to change their habits, rendering the programme futile [28]. Though gender dynamics are relevant here in that it may be easier for non-menstruators to influence change than menstruators, without the other group being engaged in the programme, the same logistical point stands that changes may be constrained. This reinstates the importance of all community members being engaged simultaneously for collective change and lasting impact.

The non-menstruators perhaps understood this, as instead of being dissuaded by their family's lack of will to work together they asked World Vision for help on how to combat their deeply ingrained cultural stigmas. Programme staff understood that progress would be slow due cultural stigmas limiting the outcomes of interventions, but were hopeful and encouraged by observing that small changes that had already occurred. If these changes are too slow and the same mechanism needs to be achieved, some other input may be required to give this sense of encouragement or demonstration of the health benefits.

Community

Having worked with them since the beginning of the influx in 2017, World Vision staff have a good understanding of what motivates the Rohingya. Being a devout Muslim community, World Vision understood that messaging from the Imam was very powerful, both in instilling positive and negative perspectives on menstruation. World Vision runs another programme addressing the low usage of contraceptives among the population; religion being a significant obstacle. According to respondents in a study on the Rohingya, 'not having the desired children is deemed as a sinful act and goes against the

teachings of Islam' and to 'reject what is perceived as a gift from Allah [God] is considered a sin and would displease Allah' [8]. Additionally, they write that menstruators 'perceive themselves as vessels responsible for the growth of the Islamic population in the world' especially if they are in good health and capable of making provisions [8]. This and other studies also found that 'Rohingya women often obey their husbands' commands in matters of contraception, fearing repercussions such as intimate partner violence or the threat of ending marital relations' [29]. Thus, World Vision shaped their messaging to both parents to convey Allah's wish for families to concentrate on the lives that already exist and to take good care of the mothers' and child's health, which may be compromised by having more children, especially in the context of the camp. The population then became much happier to use contraceptives. World Vision reported that having messaging such as this come directly from the Imam is more effective. Accordingly, organisations can work with the Imams to promote messaging which advances the health and wellbeing of the population.

Many respondents spoke about how they were proud not only to be able to support their families, but also to spread messaging and lead an example to other members of the community. Some even spoke about how their own older non-menstruator family members were an inspiration to them when observing them give support to their menstruating family. One study on males in violent prevention research found that 'men who take action to stop incidences of violence not only help lessen negative outcomes, their behaviour also challenges misconceptions… and fosters a sense of community responsibility for violence prevention' [14]. This point again looks at the pre-existing social system as a causal mechanism, rather than inputs from the programme alone. Jagosh et al. speak about how programme inputs may eventually turn into contextual factors over time, which lead on to other mechanisms as a 'ripple effect' [30]. With discussing and supporting family with menstrual health becoming commonplace among non-menstruators, it becomes the norm, allowing other non-menstruators to follow suit naturally.

Safety has been documented as a key factor that may prevent people from participating in humanitarian programmes [31]. Within the IPTs, staff also had observed that conflict impedes programme attendance. Non-menstruators recognised that World Vision worked to provide a safe and comfortable space for people to attend including splitting members by age and sex, as per preference. Non-menstruators spoke not only about how it was a safe space free from threat of violence but how the space allowed everyone to share and ask questions without judgement or shame. It was interesting to see how some participants felt they wanted to replicate the gender dynamics of male and female World Vision staff working together when this goes against Sharia Law. The UNHCR study also found that issues related to gender relations are hard to address when similar imbalances are 'embedded and reproduced within social norms, the humanitarian system, and national and international institutions of power' [31]. Perhaps by seeing menstruators in World Vision take a leading or equal role to non-menstruators, ideas about gendered roles may transform in the community.

Though the 'Norms' element of the RANAS model suggests a negative reaction from neighbours could be a deterrent from adopting new behaviours, most participants seemed to remain steadfast in their belief that it is the neighbours who need to change their perspective if not aligned with the campaign. One realist evaluation looking at the prevention of intimate partner violence discussed how the men in the study were able to change their behaviour because there were 'acceptable alternatives to the dominant masculinity' where they could make behavioural changes but still meet 'masculine ideals' [11]. This may apply here where – though changing the typical role of masculinity wherein menstruation is not discussed or helping out with household tasks that may be typically for women – they are adopting a new role of being supporter to their family members, which still may be considered masculine. If the programme was conducted in a community where the reaction of neighbours and friends was a big influencing factor, an intervention to address this would have to be implemented. Additionally, ideas of masculinity should be understood and used to tailor interventions.

Organisational

All participants spoke extensively on how their relationship with World Vision and the MH facilitators was a big factor in creating a comfortable and equal space in which they felt respected, not forced to change their opinions, and given time

to contemplate the new information. Similarly, in Hennegan et al.'s study on the influence of menstrual health on adolescent girls' health and education outcomes, researchers found that participants would become more honest and give more detailed answers the more familiar and comfortable they became with the researchers [32]. All non-menstruators said the frequency of meetings is a key input to help them gain confidence and commitment to their supporting roles. They also said this would help uphold the relationship they have with World Vision.

Behaviour change campaigns can easily become neo-colonial, often promoting a homogenized set of behaviours that align with globalized norms, leading to the erosion of cultural diversity. What UNICEF and World Vision aimed to do here was to provide the community with information on improving menstrual health, but for them to shape what this looks like for themselves. This was maintained by having MH facilitators who are part of the community. Community Change Champions have been used in development programmes as an effective, decentralised, and community-led way of improving a population's behaviours [33]. Studies have found that positive ratings of champions' performance were significantly correlated with the success and validity of programmes and that selecting suitable champions is likely to influence positive results of such community health programmes [34]. Concurrently, it was reported that the community MH facilitators were more influential than the World Vision teams.

Conclusion

Recent guidance illustrates the importance of engaging non-menstruators in humanitarian programmes to reduce barriers to menstrual health in these settings. Though some humanitarian organisations have begun to include this in their programmes, there remains a paucity of literature on why and how these programmes are meant to work. Drawing on realist approaches, this study addresses this knowledge gap and articulates key causal mechanisms of shifting attitudes and behaviours towards menstruation using a World Vision programme as an exemplar. These findings contribute important data-driven and theory supported insights that are critical to advancing the engagement of non-menstruators in menstrual health in humanitarian settings. The study's refined programme theories, framed within the Socio-Ecological Model, reveal multiple levels of influence. On the individual level we have seen how it's crucial to help non-menstruators understand and become empathetic towards the health risks, recognise their responsibility within the family, and gain confidence in their ability to share knowledge and carry out the supportive tasks. On the interpersonal level, it was demonstrated that perceiving their family to be happy, healthy, and appreciative as a result of their support is a big motivator for non-menstruators to continue the behaviours. At the community level, it was evident that messaging from the Imam was well received to change perceptions and remove misconceptions. The notion of working to better the whole community was also a big motivator. It was also important to create a safe space for non-menstruators to feel comfortable to learn and share in. Any negative reactions from neighbours did not seem to have much impact, with the non-menstruators possessing a strong sense of integrity. Lastly, the organisational level showed the importance of cultivating a trustworthy relationship with World Vision. The study underscores the importance of culturally sensitive approaches and the role of community members and leaders, such as Imams, in disseminating positive messages about menstrual health. By fostering a supportive environment and leveraging existing social structures, organisations can more effectively engage non-menstruators to promote menstrual health, ultimately contributing to menstruators' overall health and wellbeing, a necessary component of gender equity.

Supporting information

S1 Text. Initial programme theories.
(DOCX)

S1 Table. Literature gap analysis.
(DOCX)

S1 Checklist. PLOS inclusivity questionnaire.
(DOCX)

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