



“Road traffic injury could be minimized when individual road users take more responsibility for their safety and the safety of others”: Perception of healthcare workers in Vanuatu

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ABSTRACT

Introduction: Around 1.35 million deaths are caused by Road Traffic Injuries (RTIs) each year. This study aimed to explore the perceptions of Vanuatu’s Health Care Workers (HCWs) regarding the existing preventative strategies for RTI.

Materials and methods: In 2020, this study used qualitative approaches to collect data from HCWs using Focus Group Discussions (FGDs). Study participants were self-identified Ni-Vanuatu HCWs who had been serving for more than 6 months in three main hospitals where the study was conducted and purposive sampling was used to gather the study participants. To guide the FGDs, a semi-structured open-ended questionnaire was created. Thematic analysis was used to process the data obtained, based on predetermined themes that were based on theory while also enabling the data to determine new themes.

Result: From 5 FGDs with 22 HCWs who were emergency nurses, doctors and public health officers, data saturation was reached. The study yielded five main themes and sixteen subthemes. The relevance and trends of RTI, barriers to effective care, pre-hospital management capacity, barriers to pre-hospital care and addressing RTI were among the key subjects. The findings suggest that addressing health institutional leadership and resources will improve prevention of RTIs.

Conclusion: Prevention of RTIs is hindered by the lack of health institutional capacities in terms of leadership and resources that include emergency equipment, financial and trained human resources. The health sector should consider developing stronger leadership in road safety to be an essential part of its core business.

1. Introduction

Known to be one of the leading causes of death worldwide, Road Traffic Injury (RTI) is becoming a major public health concern [1]. Pedestrians and vehicle riders in Low and Middle Income Countries (LMICs) are disproportionately affected by RTI there is a 3-fold increase in the risk of someone dying from RTI compared to high-income countries [2,3]. There are approximately 1.35 million deaths annually due to RTI, and it is the leading cause of death among people in the age group of 5–29 years old and it is one of the top

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ten leading causes of death in the world for all ages [4]. According to reports, low-income countries have only 1% of the world's motor vehicles, yet they account for 13% of all fatalities [3,5,6]. The number of people killed by RTI today exceeds the number of people killed by tuberculosis and HIV/AIDS, which are commonly considered as leading causes of death in the world [3]. Young adults and adults aged 15–44 are more than half the victims of RTI, and they are often the main providers in their families [7]. Despite some global success in controlling and preventing communicable diseases, studies show that noncommunicable diseases (NCDs) and injuries are increasing at an alarming rate [8]. Inactivity caused by RTI contributes to NCDs, including hypertension, diabetes, and stroke by adding injuries and disabilities to the equation [9]. The consequent cost to our societies, measured by some estimates at 2% of their total GDP in most LMICs, is colossal [10].

RTI will become the leading cause of death among young people in the Pacific region by 2020 as a result of increasing motorization [2]. Various research projects have demonstrated that road traffic laws can save lives and prevent injuries in different regions of the world [2,3,11]. Without appropriate intervention, RTI will become one of the leading causes of death and morbidity in the Pacific including Vanuatu, along with diabetes and hypertension [3,12].

RTI rates in the Pacific islands region, especially Vanuatu, are steadily rising. Because the issue has received so little attention, it presents a significant danger to public health [13]. There have been significant improvements in reducing illness and death from RTI in high-income countries, but no similar improvement has occurred in low- and middle-income nations [3,9,14]. In terms of reducing road traffic deaths, the improvement has varied significantly between countries and regions [5]. The Pacific islands are a region with very few studies on RTI [13]. A critical need exists in this region for expanding knowledge on RTI situations. Investing in preventable causes of road injuries will help improve road safety [15]. Since Health Care Workers (HCWs) deal with RTI victims on a daily basis, they are an excellent source of insight into how to prevent RTI as a public health issue [16]. The views of HCWs on how to prevent RTIs are of utmost importance, since they see the problems and pain caused by RTIs, hence the basis upon which we can get specific information on RTI prevention measures.

The main cause of RTA and RTI in Vanuatu is over speeding, despite the Traffic Control Act (TCA) which limits vehicle speeds in built-up areas to 40 km/h [17]. RTIs kill 16 persons in Vanuatu for every 100,000 people, according to estimates. This is three times higher than in Australia and Fiji, where the figures are 5.4 and 5.8 per 100,000 people, respectively. It is also significantly higher than in the United States, where 10.6 per 100,000 people lose their life to RTI, placing Vanuatu 91st in the world [3]. Based on this statistics, Vanuatu's roads are likely to be among the most dangerous in the region, or its drivers among the most irresponsible [18].

In some studies health workers have highlighted the need to enhance the role of primary health care providers who play a crucial role in mobilizing community-based road safety management. They support knowledge exchange among multi-professional networks, motivating activity implementation and developing academic works from routine to research [19]. It was also highlighted that RTI could be prevented when prehospital care systems for RTIs are improved and formal medical emergency services are improved [20, 21]. It was also highlighted that proper coordination of multisectoral response to the RTI burden and maximizing the use of scarce resources is the way forward [1]. Many studies have called for a multisectoral and evidence-based approach to preventing road traffic injuries, with public health playing an important role and emphasizing the importance of a strong political commitment [22].

Due to the paucity of study and research in this field, RTI is a subject that has significant gaps in knowledge [7]. With the lack of knowledge to appropriately address RTI, the vulnerable populations and their families are more likely to be trapped in poverty [23].

1.1. Aim and research question

1.1.1. This qualitative study aims to explore perceptions and practices of HCWs in Vanuatu regarding RTI prevention

In addition, it identifies the key gaps and proposes optimal strategies for improving road safety in Vanuatu, including ways for pre-diagnosing the major causes.

1.1.2. What is the perception of health workers on the challenges faced with road traffic injury patients in Vanuatu?

What is the perception of health workers on the preventive solutions for road traffic injury patients in Vanuatu?

2. Materials and methods

2.1. Study design and setting

As part of this qualitative study, FGD were conducted with HCWs who were emergency nurses, Doctors and Public Health officers in three municipal hospitals of Vanuatu between October 1 and November 15, 2020. Based on the number of RTI cases registered annually, Lenakel Hospital in Tanna, the Vila Central Hospital in Port Vila, and the Northern Provincial Hospital in Luganville Santo were chosen. Obviously, more information was provided through FGDs than if it were conducted separately. A FGD allows for the discussion of additional information and thus permits participants to make clarification on any ideas that require elaboration [24–26].

2.2. Study sample

Public health officers, emergency nurses and doctors of the selected hospitals who met the inclusive criteria were selected to participate. Both males and females, who identified themselves as Vanuatu citizens and who had more than six months of working experience, were included. Those unwilling to participate were excluded.

Based on the relatively small number of primary data sources who will contribute to this study, Purposive Sampling was used

because it was appropriate and cost-effective sampling method for this study [27]. Two FGDs each were conducted in Port Vila and Luganville municipalities, and one FGD was conducted in Lenakel hospital. There were no separate FGDs for the different categories of study participants. The number of FGD was considered and reached based on data saturation. Data saturation was reached after conducting five FGDs comprising of four to five participants in each group ($n = 22$) in all three municipal hospitals.

2.3. Data collection tool

A semi-structured open-ended questionnaire was developed to provide guidance on the discussions. The questionnaire was developed based on relevant literature reviews paying special attention to the research questions. Two sections of questionnaire were prepared including the demographic questions and five open ended questions. Open-ended questions were used to probe elicit information from participants and allowed participants to express their personal views freely [28]. Demographic characteristics collected included participant gender, age, education level, years of experience, and where they grew up. Pre-test of the questionnaires was conducted to ascertain if the questions, directions, and language used were clear to the respondents in term of their requisites. The responses from the pre-test were used to correct flaws in the question items and re-adjustment were done to meet response expectations.

2.4. Study procedure

Proper communications were established with the head of the respective emergency units and health services departments before communicating with the potential participants. All potential participants were given information sheets that were in both English and Bislama (Vanuatu common language) translations before the scheduled FGDs. Written consent was mandatory for this study thus, those participants who agreed to participate were requested to complete and signed a consent form. Conversations were audio-recorded after verbal consent and permission. Confidentiality of our participants were rest assured, this so they give out information without bias. The main researcher ensured that all FGDs were conducted in isolation from other potential study participants who may influence responses. In conducting the FGDs, questions were asked in a manner that began with simple and general questions and then progressed into more specific ones. As part of the FGDs, participants were asked to write down their demographic information based on the questions asked and returned it to a researcher. During the FGDs, probing techniques were used based on participants' reflections in relation to their experiences and their perceptions of RTIs. Initial data analyses were conducted simultaneously to identify ideas that might guide the next FGD. All FGDs were conducted in Bislama by the main researcher. During the course of the study the main researcher conducted only one FGD a day to avoid exhaustion that consequently would affect the quality of questions asked but also to give ample time to organize these FGDs and to ensure convenience for all participants. Depending on the responses provided, all interviews lasted anywhere from 45 to 60 min. The data collection was continued until saturation with each concept was reached, and further data collection failed to reveal any new insights [29].

2.5. Data management and analysis

Data from digital recorders and any additional notes taken during FGDs were transcribed using Microsoft Word. Each FGD transcript was checked twice - once immediately after transcription by the researcher and the research assistant, and again when analyzing the data. Translation of the transcripts were done by the main researcher and research assistance. Disagreements or issues needing further clarity were resolved through discussions and triangulation of data sources. Thematic analysis was carried out based on both predetermined issues of interest as well as new issues raised by the respondents for these focus groups [30,31]. Themes representing the research topic area were listed and coded based on frequency and order of mention. Codes were categorized and themes identified through the use of open coding [32]. In the data analysis process, large raw data quantities are summarized, categorized, and rearranged. The data obtained was sorted and compiled in the form of tables to allow for additional analysis.

2.6. Study rigor

To ensure rigor, credibility, confirmability, transferability, and reliability were ensured. Researchers' field experiences, their engagement with participants, data collection and analysis, and data triangulation, which included FGDs and peer reviews, all contributed to the credibility. As the principal investigator, the first author used triangulation and peer review in order to achieve a high level of confirmation. By explaining how data was acquired and analyzed, as well as how the results were interpreted, demonstrated transferability. And finally, the results of this research can be depended on because the development method was explained so thoroughly that an alternate investigator may possibly repeat it.

2.7. Ethical considerations

Ethical approval was sought and received from Fiji National University's (FNU) College Health Research & Ethics Committee (CHREC) with reference number of 255.20 and the Vanuatu Ministry of Health Research and Ethics committee. Information explaining the aim of the study were provided orally and in writing to all study participants. Because written consent was required, it was obtained for all participants.

3. Results

3.1. Characteristics of participants

Table 1 below summarizes the demographic characteristics of health workers participating in this study. A total of 22 health professionals participated, including hospital emergency department personnel and public health officers. All participants consented to participate. The total respondents were evenly distributed by gender (50%) but their ages varied significantly, with 68% of them older than 40. A majority of them (91%) had a university or tertiary qualification. Forty-five percent (45%) of respondents were employed for more than 21 years, 41% (41%) between 11 and 20 years, and fourteen percent (14%) under ten years. Additionally, 73% of participants were born and raised in the village. In this study, ninety-one percent (91%) of the participants are married at the time.

3.2. Perception of HCWs

The main themes generated from the FGDs include the significance and trends of RTI, barriers to effective care, hospital management capacity, barriers to pre-hospital care and addressing RTI. A further eighteen sub-themes were developed from these main themes (Table 2). The FGDs involved 22 HCWs who were emergency nurses, doctors and public health officers. Thematic analysis of the FGD are described under succeeding main themes and sub themes that follow. Samples of interview responses are also quoted. Each interview sample quoted are labeled with the age and gender of the respondent including the unique participant identification number HCW 1 which represent participant 1 and so on.

Theme 1: Significance and trends of RTI.

Four sub themes that include RTI as a public health issue, RTI as a silent endemic, the severity of RTI, and the common victims of RTI emerged when the respondents were asked about their general view of RTI in comparison to other injuries.

3.2.1. RTI a public health issue

According to the respondents, RTAs and related injuries have emerged as an important public health issue which needs immediate attention among relevant authorities. The trend of fatal and disabling RTI is increasing day by day and is a real public health concern. The respondents recall overwhelming trends of RTI and deemed it to be among the top public health issues at hand. The respondents agree overwhelmingly that,

“Injuries caused from RTAs is out of control and the department of public health must take it seriously and address it” (32 years old male, HCW20)

The respondents also stated,

“The ministry of health needs to take a proactive role to tackle RTI, it is becoming a matter of public health concern”. (44 years old male, HCW14)

In contrast it was also interesting to note that HCWs despite acknowledging that RTI is a matter of great concern they only realized during the discussions that RTI is a public health issue that come under ministry of health responsibility.

“I always thought that issues to do with RTA and related injuries are a matters to be address by the ministries of internal affairs and public utilities, I never thought of it as a ministry of health issue”. (43 years old female, HCW8)

3.2.2. Silent epidemic

The respondents perceived that despite the increase in incidence, RTI was not accorded the importance it deserves in policy and in

Table 1
Profile of Health worker respondents (n = 22).

Respondents	Categories	Frequency (n)	Percentage (%)
Gender	Male	11	50
	Female	11	50
Age	25–40 years old	7	32
	41–60 years old	15	68
Level of Education	≥ Tertiary	20	91
	High School	2	9
	Primary School	0	0
	No school	0	0
Number of years employed	0–10 years	3	14
	11–20 years	9	41
	≥21 years	10	45
Grew up	In town	6	27
	In the Village	16	73
Marital status	Married	20	91
	Single	2	9

Table 2
Main themes and sub-themes for HCWs.

Themes	Sub Themes
Significance and trends of RTI	RTI – a public health issue RTI – a silent epidemic Severity of RTI Common Victims of RTI
Barriers to efficient care	Lack of human resources Lack of emergency equipment Lack of good emergency coordination Poor communication
Hospital management capacity	Crash location Workload High cost of care Quality of care
Barriers to pre-hospital care	Lack of first aid knowledge Involvement of lay people Traffic obstruction
Addressing RTI	Individual responsibility Health system strengthening Community education

practice. More attention to RTI is required to address the issue. One participant stated,

“I think the authorities must pay more attention to RTA, it is a serious problem and the impact is devastating compare to other public health problems”. (38 years old male, HCW22)

One other respondent stated,

“I am surprise that no one is talking about RTI, even the media but it is a real growing problem RTI is disabling and killing breadwinners but no one is talking about it”. (42 years old male, HCW1)

Another respondent asked,

“Why are the police so quiet about it and we never hear any radio or see any TV programs to inform people about the RTI situation”. (46 years old female, HCW5)

3.2.3. Severity of injuries

Generally, when comparing RTI to other injuries almost all the respondents acknowledged that RTI has increased terrifically but worst is that today injuries sustain in RTA are regularly more severe than it always has.

“Today victims of RTI die on arrival or die few hours after arrival in hospital, the injuries commonly sustained are very severe and at many occasion there very little we can do to save them”. (43 years old female, HCW8)

Another participant stated,

“In my 30 years of working as a registered nurse and over 14 years as an emergency nurse the recent victims of RTI scared me”. (55 years old female, HCW6)

Furthermore, the participants relate the severity of injuries to the length of hospital admission. One respondent stated,

“Patients admitted to hospital due to RTI today would spend weeks and months in the hospital”. (41 years old female, HCW9)

3.2.4. Common victims of RTI

According to the respondents when asked about what the victims have in common, they were quick to say that victims of RTI are usually young people age between 20 and 30 years old.

“In the last 5 years the majority of victims of RTI injury that present to the emergency unit are young in their 20s or early 30s”. (35 years old female, HCW7)

Another respondent detailed,

“The victims of RTI are young people aged between 20 and 30 and most of the time they are drunk. Victims are often young men but young girls also show up”. (40 years old male, HCW16)

It was also perceived that most victims of RTI are under the influence of alcohol when received at the emergency,

“Many of the RTI victims brought into emergency are under the influence of alcohol”. (44 years old male, HCW17)

Theme 2: Barriers to effective hospital emergency care.

Five sub themes that include human resources, emergency equipment, emergency co-ordination, communication and crash location arose when participants were asked about the challenges face by health workers managing and preventing RTI.

3.2.5. Lack of human resources

The respondents perceived that there is a general lack of adequate staffing in the hospital emergency departments. Almost all respondents highlighted that HR was a key challenge when it comes to dealing with RTI and especially when multiple victims are involved.

“Our emergency units throughout the country lack work force, we rarely have doctors stationed at the emergency unit and the few nurses operating the emergency unit are often very busy. RTI are commonly very severe and many times, it requires all the nurses to attend to these victims leaving other patients unattended”. (50 years old male, HCW3)

The number of nurses per shift is less than required, another respondent stated,

“We only have 2 nurses in a shift; it is quiet challenging trying to attend to RTI patients when other emergency patients are around. Many times we sought help from our colleagues in other departments if not it would be unmanageable”. (38 years old male, HCW22)

The discussions highlighted that some RTI deaths could have been prevented had the emergency units have the required number of staffs per shift. One respondent stated,

“If we had enough staffs per shift in the emergency departments some of these RTA deaths would have been prevented”. (48 years old female, HCW18)

3.2.6. Lack of emergency equipment

The respondents noted the lack of numerous specific emergency items due to stock-outs and equipment breakdowns as worrying. According to almost all the respondents, the hindrance in dealing with RTIs is the lack of emergency equipment that can support multiple casualties when they present. One respondent stated,

“Our emergency units do not have or do not have enough equipment that can manage multiple cases or very severe forms of RTIs”. (39 years old male, HCW11)

The broken down machines have not been repaired, another respondent expressed,

“Some of our machines like the pulse oxy-meter and defibrillator have broken down since almost a year ago and have not been fixed or replaced”. (44 years old female, HCW12)

The ambulance itself is not fully equipped, another respondent commented,

“Our ambulances only have the siren working, nothing else are working. The ambulance does not have the emergency equipment required. We have to get equipment from the emergency unit when the ambulance is call for extrication”. (44 years old male, HCW14)

3.2.7. Lack of good coordination

The issue of coordination emerged when respondents expressed that the organization and management of major RTI with other stakeholders is very difficult and often cause unnecessary delays and mismanagement of victims of RTI. They stated,

“We often suggest to people to call private paramedical or military to give assistance during emergencies. Our emergency unit personals and the only ambulance are often preoccupied with other emergency and then everyone waits in anticipation that a response team will arrive, no one follows up. At most occasion private individual rush in with the patients whose conditions may be life threatening”. (43 years old female, HCW8)

Leadership in emergency units is an issue, several other respondents conveyed,

“Our response services to RTI when alerted are very slow because of lack of leadership to provide directives for response. The private paramedical team are doing much better than us”. (45 years old female, HCW10)

3.2.8. Poor communication

Communication is another issue that aroused when the challenges were discussed, respondents claimed communication play a vital role but the lack of good communication make response to RTI difficult.

“Telecommunication network issues make it difficult to collect information or to provide advice from the main emergency facility. Lack of good communication may affect the outcome of managing a victim before hospitalization”. (54 years old male, HCW13)

It was also noted from the discussion that often there is a discrepancy between what is said and what is heard. One respondent stated,

“We also have issues with people making these emergency calls, sometimes they present inaccurate information thus affecting how we respond”. (50 years old male, HCW3)

3.2.9. Crash location

Another significant challenge highlighted during the discussion was the crash location. Respondents articulated that the ambulance and thus the emergency unit personal do not attend to RTI that occur in the outskirts of town due to distance and in most occasion the road conditions. Victims of RTI have to be transferred to hospital via private vehicles.

“We do not attend to RTI victims outside of town due to distance and the road conditions. There is only one ambulance and we only have handful of emergency staffs, if we go this far the next emergency may not be attended to”. (42 years old female, HCW4)

There is an ambulance service policy that limits how far the ambulance could service, the respondents stated,

“Our ambulance policy is to provide service within the municipality area only. We advise people who call us from outside the municipal area to call paramedical or get a private transport”. (40 years old male, HCW16)

Theme 3: Hospital management capacity.

Three sub themes that include workload, the cost for care and the quality of care emerged when describing the challenges on hospital management capacity dealing with RTI. The demand for patient beds is greater than the number of beds available. Most RTI patients require increased length of stay, which sustain workload on the staff, which led to several negative effects including declining patient and staff satisfaction.

3.2.10. Workload

Hospitalization of RTI cases requires greater amount of nursing or medical care and of working time compare to other conditions as hospitalization of RTI patients may last for weeks to several months. As stated by several respondents,

“Given that only two or three nurses manning the surgical ward in a shift, taking care of RTI patients with fractures or large operations among other patients the workload in the surgical ward is just unbearable”. (47 years old male, HCW2)

Other respondents expressed the duration of time spend nursing RTI patients,

“We spend more time on nursing care for RTI patients compare to other surgical patients”. (35 years old female, HCW7)

Emphasizing on the length of hospitalization for RTI patients, the respondents reflect that the workload remain high as staff numbers per shift do not increase. One respondent stated,

“The longer it takes for one patient to be admitted, the workload remains high as surgical patients with other conditions and operations are always in and out”. (27 years old female, HCW19)

3.2.11. High cost of care

Respondents perceived it is expensive to take care of RTI patients in hospital, the nursing and medical care requires a lot of medicine and dressing or materials for wound care and including three meals a day for patients.

“The cost of hospital care for RTI patients is twice or three times that of other surgical conditions”. (46 years old female, HCW5)

Given the high cost of hospitalization some cost had to be incurred by the government, one respondent stated,

“When patients are admitted for more than two weeks they only pay for two-week admission bill, the rest of the stay is free and the cost had to be covered by the hospital”. (44 years old male, HCW17)

It was also acknowledged during the discussions that it is also costing the relatives to take care of RTI patients. One respondent stated,

“As much as it is costing the hospital to care for RTI patients, the relatives are also struggling to provide and care for these patients”. (41 years old female, HCW9)

3.2.12. Quality of care

Increased hospitalist workload is associated with minimal quality clinical care. According to the respondents when the workload is high the quality of general nursing care deteriorates. RTI patients often require long duration of hospitalization encountering sustain high workload on clinicians.

“We can understand that when the workload is high it often affects the quality of care to our patients. This often happen when we are full ward and only 2 or 3 nurses working in a shift, so while trying to attend to all the patient needs we try to work fast and it is below standard and risky”. (48 years old female, HCW18)

Working under pressure affects impacts negatively on the standard of practice, another respondent stressed that,

“When we are under pressure from the patients, we choose to try to attend to everyone and ignore the high standard of practice expected of us”. (44 years old male, HCW16)

Theme 4: Barriers to pre-hospital care.

Three subthemes that include inadequate knowledge on first aid, involvement of laypeople and traffic obstruction were generated when discussing the challenges with pre-hospital care.

3.2.13. Lack of knowledge on first aid

Many people lack the knowledge and confidence to administer basic first aid. The FGD revealed that in most cases people react and try to intervene at the scene but in most occasion they cause more problem to the already injured person. One of the participants stated:

“Commonly people try to offer help, but they do not have the appropriate first aid skills and instead of helping they worsen injuries”. When asked how the respond was,

“Example, they lay the victims flat resulting in airway obstruction, had they know they need to tilt the head back, support jaw, keep the fingers clear of throat”. (32 years old male, HCW20)

By standers don't often have a glue how to assist, one other respondent stated,

“Many on lookers just cannot offer support because of the lack of knowledge and experience on first aid interventions”. (39 years old male, HCW11)

It was also suggested that more first aid trainings should be roll out to the communities so that people become familiar with basic first aid intervention to offer when the need arise.

“First aid trainings for the general population should be conducted throughout the country so that people have the basic first aid knowledge to provide support when needed”. (44 years old female, HCW12)

3.2.14. Involvement of laypeople

The respondents viewed overcrowding at the crash scene as a problem as it forms a barrier for appropriate and timely pre-hospital intervention. One of the participants stated:

“At many occasion when we arrive at the RTA location it may take as a while to reach the exact scene as people are overcrowded and prevent us from providing timely intervention. At some point they are already mobilizing the victims which would have worsen their injuries”. (44 years old male, HCW14)

Nevertheless, it was acknowledged that the laypeople could be of some support,

“Laypeople can offer support by contacting the emergency services, help to put out fires or preventing harm to rescuers but not to mobilize the victims when help is already on the way”. (27 years old female, HCW19)

In situations where bystanders know what to do the outcomes are favorable, one respondent added,

“The scenario could be different when people who have attended first aid training are among the crowd, they can communicate and practice appropriate interventions”. (40 years old female, HCW16)

3.2.15. Traffic obstruction

Traffic obstruction caused by vehicle moving too slowly, stopped, or parked on a road when the ambulance tries to drive through freely is a common obstruction to pre-hospital care. The respondents noted that it prevents timely interventions by pre-hospital service providers. One of the respondents stated:

“Many people do not understand or choose to ignore ambulance services and it has always cause delays to reach the crash site or to arrive at the hospital emergency unit with the injured victim”. (45 years old female, HCW10)

It is an offence to intentionally obstruct ambulance passage, one other respondent stated,

“It is by law a traffic offence to intentionally obstruct ambulance services but some drivers do not care and it is worrying”. (46 years old female, HCW5)

The discussion also revealed that most of the time the obstruction is unavoidable,

“Our roads are also contributing to these obstructions, in some locations the roads are too small and there is nothing much the drivers can do then to wait and allow the traffic to clear spontaneously”. (55 years old female, HCW6)

Theme 5: Addressing RTI.

Three sub themes that include individual responsibility, the health system and community education were established when respondents were questioned and discussed preventing RTI. The respondents viewed that RTI must be addressed beyond the range of common activities to effectively address RTI issues.

3.2.16. Individual responsibility

According to the respondent's road users choose, instigate, or otherwise cause their own actions. Therefore, they are responsible for their own safety as well as the safety of others. One respondent stated,

"RTI could be minimized when individual road users including drivers, passengers and pedestrians take more responsibility for their safety and the safety of others". (42 years old male, HCW1)

Accidents happen when people least expect, another respondent stated,

"RTI incidents happen when people least expect, when you are on the road be mindful that you or your passengers could be a victim thus we must always be cautious and take responsibility". (43 years old female, HCW8)

Social responsibility is an ethical theory in which individuals are accountable for fulfilling their civic duty, and the actions of an individual must benefit the whole of society. One of the respondent stated,

"People who are in charge of public transport must at all-time remember that they are serving their community and thus the safety of the people in their community is paramount. Hence, they must respect their role and responsibility in the society. This will make our roads safe". (30 years old female, HCW21)

3.2.17. The health system

The respondents added that a well-functioning health system is built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding. They perceived that the health system needs improvement in terms of resources and management to address RTI. One respondent stated,

"The emergency department need well trained and qualified personals as well as emergency equipment to meet the growing service demand. The emergency equipment that need replacement or that are needed should be done already". (44 years old female, HCW12)

The current state of human resource is worrying, one respondent expressed,

"There is urgent need of human resources, nurses, doctors and paramedics for the emergency unit". (42 years old female, HCW4)

Leadership and management is a concern, one other respondent added,

"We need strong leadership, good management of our emergency departments and there has to be good coordination of emergency services". (44 years old male, HCW14)

3.2.18. Community awareness

There is desperate need for community awareness to increase the community's knowledge on important issues affecting the communities including RTI. The respondents perceived community awareness as vital in this era of rapid modernization. One participant stated,

"People are not aware that we have a RTI epidemic in Vanuatu and they are not taking the issue seriously". (50 years old male, HCW3)

Community leaders appear to not taking the situation seriously, one respondent question,

Are our community leaders well informed of the situation, I am sure they are and are they ignoring the situation? It is a growing concern". (45 years old female, HCW10)

It was also noted during the discussion the issues with ambulance services and the need to educate the communities on ambulance and emergency services. One respondent stressed,

"There has to be community education about ambulance services in the traffic and in the communities to avoid obstructions and therefore unnecessary delays". (48 years old female, HCW18)

There is need for general understanding on the role of emergency workers, another respondent added,

"The general population have to be aware about the role of emergency workers to address issues of onlookers that in most occasions slow the process of care". (39 years old male, HCW11)

4. Discussion

The study examined how HCWs perceive preventing road traffic injuries in Vanuatu. Based on the results the findings were summarized into five main themes, the importance and trends of RTI, barriers to effective care, pre-hospital management capacity, barriers to pre-hospital care and strategies for addressing RTI.

4.1. The significance and trends of RTI

It was interesting to note as it was not to our expectation the findings in this study suggest that RTI is less considered a public health issue at policy level and there is lack of leadership to deal with the issue appropriately. However, as expected the findings indicate that the trend of RTI is constantly increasing. The rate of hospitalization among young people are perceived to be persistently rising. Moreover, the number of people lost to RTIs have also increased over the recent years. The emergency nurses described the severity of recent RTIs as serious, often life threatening and require secondary or tertiary care if victims don't die. The current RTI situations were described as horrifyingly persistent compare to some ten years back. The findings suggest that Vanuatu roads are not safe as RTAs are happening every day and RTIs are common. These observations aligned with the world health organization (WHO) report on RTIs, that road traffic death rate in Vanuatu is 16 per 100,000 populations. This is 3 times higher than Australia and Fiji, 5.4 and 5.8 per 100,000 populations respectively and is much higher than in the USA 10.6 per 100,000 populations [18]. This indicates the shocking reality by such a plague and demonstrates that the Vanuatu roads are of the most dangerous or that Vanuatu drivers are the most reckless in the region. Vanuatu's RTI situation is not unique in the region and in other LMICs. In the pacific, studies from PNG reported that RTIs contributed to at least 40% of all deaths, 60% of trauma-related deaths and one third of trauma-related hospitalizations [13]. The economic costs of RTIs increased by threefold since 2007 and are equivalent to 1.52% of the gross national product, indicating the growing national financial burden associated with preventable RTIs [7].

4.2. Barriers to effective care

As expected the findings in this study marquee the lack of resources characterized by lack of human resources, finance and equipment as the root cause of their ineffectiveness to prevent and care for RTIs. It is perceived that the lack of qualified human resources and specialized equipment is a major barrier to impact positively on preventing RTI and offering pre hospitalization and in emergency cares. The finding suggests that the inadequate number of ambulances and the fact that the existing ambulances are not fully equipped with specialized emergency equipment make the work of HCW to respond effectively to RTI very difficult. However according to Quansah R et al., when looking at the availability of emergency equipment noted that the lack of planning, rather than resource restrictions, were the main reasons for the absence of such vital resources including equipment. Their findings suggest that improved administration could also strengthen utilization of resources. Administrative changes included improving communication with radios within hospital, stationing fully-trained surgeons in the emergency room during peak periods, improved trauma orientation for junior doctors, and improved reporting through a trauma registry [33,34]. The findings also suggest that there is lack of good coordination for pre-hospital services. This lack of good coordination to maximize use of the scares resources makes the situation even worse. According to WHO, prevention of RTIs is a shared responsibility and needs multi-sectoral collaboration [1,12]. Collaboration might take the form of research, information sharing, policy development, advocacy and capacity development [35,36]. Lack of coordination is one important barrier, which was in line with a study in the case of post-crash events [37].

4.3. Pre-hospital management capacity and barriers to pre-hospital care

Consistent with other similar studies, the findings in this study indicate that the weak pre-hospital care system characterized by the lack of proper emergency response coordination and leadership, the lack of collaboration with other emergency response teams, the lack of trained emergency response personals, and the luck of appropriate emergency equipment available to emergency response team increases the risk of worsening RTIs. Timely emergency pre-hospital care to traffic accident victims at the accident scene and subsequent transportation to the health facility may reduce the probability of injury severity and deaths [38,39]. In Vanuatu public hospital capacity to respond to emergency situation like RTI are inadequate and they depend on public private partnership to provide emergency response services to the communities. According to Linda C et al. in their study of first responders and prehospital care for RTIs in Malawi, it is necessary to empower local leaders to coordinate on-site responses; improve emergency communication systems; equip traffic police with road safety gear; and expanding access to ambulance services to reduce the risk of RTI deaths [20]. Other studies also reveal that LMIC have no formal prehospital care system and there is need to establish formal emergency medical services to reduce the burden of preventable mortality and disability caused by traffic collisions [21,40] For Vanuatu it would be ideal to have professional emergency medical personnel available to provide prehospital care at every road traffic collision however budgetary realities make this a distant goal. There is an urgent need to expand the number of community members including local leaders, police, and commercial drivers who could be trained as first responders [20,41]. Even short first aid courses can yield significant improvements in roadside care. A study conducted in Uganda revealed that a one-day prehospital trauma care course for community leaders, police, and taxi drivers in Uganda was effective in preparing participants to stop bleeding and safely move injured people [42]. According to Charles M et al., RTI control will be strengthened by enhancing training for these disciplines, and encouraging retention of those with the needed skills [34]. Similar type of program likely would be successful in Vanuatu, the FGD participants' eagerness to receive such training suggests that it would not be difficult to recruit volunteer first responders.

4.4. Addressing RTI through Health System Strengthening

With our little expectation, the findings point to Health System Strengthening (HSS) and strong leadership as a measure to prevent RTIs. A well-functioning health system is built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of health equipment, resources, medicines and technologies. Health systems capable of delivering services equitably,

efficiently, and in a coordinated manner are essential for achieving improved health outcomes [43,44]. The findings suggest that strengthening the prevention and care of RTIs in Vanuatu can be achieved by addressing HSS. This finding is consistent with findings in a study by Charles M et al. on. To prevent RTI there is need for adequate institutional capacity, including funding and human resources [34,45]. According to Quansah R et al., strategies to promote retention of trained personnel in countries with lower incomes are desperately needed. This especially applies to clinicians, who have the most marketability in high-income countries. Such issues obviously pertain to the general health-care system; however, loss of trained clinicians has become such a huge problem that no discussion of human resources for RTI control is complete without addressing it [33,46]. HSS requires strong leadership at all institutional levels, when these a met prevention of RTI issues can be addressed more effectively.

4.5. Strengths and limitations

This research project was conducted to obtain more information from HCWs on how best we can address RTIs in Vanuatu, a resource-scarce country with increasing motorization and related RTIs. In this region, this study is one of the very few that attempt to improve the current situation by using a qualitative approach. A few limitations could be drawn from this study despite its thorough design that contributed to the trustworthiness of the results. Only three hospitals in Vanuatu were included in this study and the number of participants was relatively small.

5. Conclusion

The most vulnerable group to RTI are the youths. The burden of morbidity and mortality caused by RTI on hospitals and families are overwhelming. Understanding the determinants or risk factors of RTIs can help us determine the best approach for preventing RTIs. The health sector has an essential role in fulfilling the goals for preventing RTI and general traffic safety. This is hindered by the lack of health institutional capacities in terms of leadership and, resources that include emergency equipment, financial and trained human resources. RTI prevention can be addressed by Health System Strengthening (HSS). Moreover, the health sector should consider developing stronger leadership in road safety to be an essential part of its main business.

Ethics approval and consent to participate

Ethical approval was sought and received from Fiji National University's (FNU) College Health Research & Ethics Committee (CHREC) with reference number of 255.20 and the Vanuatu Ministry of Health Research and Ethics committee. Participants were given the informed consent form to sign before conducting interview. All methods were carried out in accordance with relevant guidelines and regulations.

Authors' contributions

Saen Fanai: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Masoud Mohammadnezhad: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Abbreviations

CHREC	College Health Research & Ethics Committee
FGD	Focus Group Discussion
FNU	Fiji National University
GDP	Gross Domestic Product
HCW	Health Care Worker

HSS	Health System Strengthening
IDI	In-Depth Interview
LMIC	Low and Middle Income Countries
NCD	None Communicable Disease
RTA	Road Traffic Accident
RTI	Road Traffic Injury
TCA	Traffic Control Act
WHO	World Health Organization

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