

## Work-Related Stress and Substance Use as Risk Factors for Chronic Disease Among Three-Wheel Drivers in Galle, Sri Lanka: A Qualitative Study

### Abstract:

**Background:** Motor three-wheel drivers provide an important means of transportation in Sri Lanka, comprising 15% of motorized road vehicles. Although three-wheel driving is a widespread occupation for Sri Lankan men, little is known about their general health or risk factors. **Objectives:** This paper investigates chronic illnesses and risk factors for such illnesses in a sample of 33 three-wheel drivers in Galle, Sri Lanka. **Methods:** A qualitative investigation was conducted between June and August 2012. 20 three-wheel drivers participated in 60-minute semi-structured interviews, and 13 participated in semi-structured focus groups related to their work-related health concerns. **Results:** Illness reported included musculoskeletal pain, hypercholesteremia, hypertension, and diabetes. Participants identified work-related stress and substance abuse as risk factors. **Conclusions:** Participants described a cycle of work related stress, substance use, and chronic illness. Community-based education on the risks of substance use and alternative means of coping may be an effective intervention for these workers.

**Key Words:** Qualitative Research; Global Health; Non-Communicable Disease; Social Determinants of Health

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### Introduction

Like other developing South Asian nations, the Sri Lanka struggles to maintain a transportation infrastructure that can accommodate and facilitate growth. Because the economy is expanding much faster than the transportation infrastructure, a number of improvised transportation systems have emerged. The most ubiquitous form of such transportation is the three-wheeler, or trishaw. These vehicles typify what [1] call "informal public transport," an unregulated form of transportation designed to meet the demand for rapid urban mobility. Although three-wheelers have been part of Sri Lanka's public transport system for decades, very little is known about the health of three-wheel drivers aside from some epidemiological data on road traffic injury [2 – 4]. This gap in research is notable given that three-wheel drivers constitute 15% of Sri Lanka's road users [1].

Three wheel drivers are nearly universally males [6] and typically have completed a high school education[1]. Often three - wheel drivers are seen as crass, uneducated, and even criminal [6]. Nonetheless, their services are perceived in Sri Lanka as being a convenient, affordable way to travel [1].

Demographically, three-wheel drivers often belong to a Sri Lankan social subset with higher propensity for substance use, i.e. they are male, young to middle aged, and have low educational attainment. According to Perera et al [7], the highest age-specific prevalence for cigarette smoking (38%) in Sri Lanka among men aged 35-44 years. Perera et al [8] also found that 53% of Sri Lankan men drink alcohol and that men chose to drink due to social pressure, for personal enjoyment, and for stress relief. Betel chewing, a risk factor for gingival bleeding, [9] has also been reported to be widespread among three wheel drivers [10].

The purpose of this qualitative study was to investigate the general health and associated risk factors among Sri Lankan three-wheel drivers. This information may be used to inform larger quantitative studies of the general the health needs of this population, and point towards possible interventions.

### Methods

#### Study Site

Galle is the largest town in the Southern Province of Sri Lanka with a population of 112,252. (Galle Municipal Council 11) In comparison to other districts in Sri Lanka, Galle performs well on a number of social and health indicators.

## Participants and data collection

Qualitative data were collected in two phases: first through semi-structured individual interviews and second through focus groups. For interview participants, a method borrowing from cluster sampling was adopted. Participants were recruited from three-wheel stands where drivers congregate to pick up fares. The larger the park, the more drivers were recruited. Focus groups were selected by snowball sampling: two well-connected three-wheel drivers were asked to recruit at least four of their colleagues for a focus group.

The inclusion criteria were that individuals had to be working as a full or part time three-wheel driver, be at least eighteen years of age, and have at least three years of experience working as a three-wheel driver. Exclusion criteria included not using three-wheel driver as the primary source of income, being under age 18, and having been a three-wheel driver for less than three years.

**Table I Sociodemographic Characteristics of Participants**

	Individual Interviews (n=20)	Focus Groups (n=13)
Age (years)	Range: 28-65 Median: 47.5 Mean: 45.95 SD: 10.46	Range: 23-57 Median: 38 Mean: 38.08 SD: 10.16
Monthly Income (Sri Lankan Rupee, LKR)	Range: 10k-40k (1 missing) Median: 15k Mean: 20k SD: 9183.32	Range: 10-20k Median: 15k Mean: 15.08k SD: 2396.58
Time Working as Three-Wheel Driver (years)	Range: 5-30 (3 missing) Median: 7 Mean: 11.76 SD: 8.04	Range: 3-22 Median: 7 Mean: 9.08 SD: 6.44
Household Size (number of individuals)	Range: 1-6 Median: 4 Mean: 3.55 SD: 1.23	Not Asked (see methods)
Marital Status	18 married 1 widowed 1 unmarried	11 married 2 unmarried
Educational Attainment	8 Grade School 6 Ordinary Levels 3 Advanced Levels 3 Missing	Not Asked (see methods)

## Stage 1: Individual Interviews

Three-wheel drivers were approached on breaks at various three-wheel parks throughout Galle. After obtaining informed consent, two investigators (one English speaking and one Sinhala speaking) conducted the semi-structured interviews with the participant while digitally recording the interview. All interviews were conducted in mixed Sinhala (the language spoken in Galle and most of Sri Lanka) and English. Twenty three-wheel drivers participated in the semi-structured interviews- twelve from Galle proper and eight from the suburbs of Karapitiya [4], Kumarakanda [2], and Richmond Hill [2]. Out of 25 drivers approached, only five declined participation.

## Stage 2: Focus Groups

Two focus groups were conducted, the first with five participants and the second with eight. Questions were asked to elicit more general, rather than personal, responses. Some sociodemographic questions were omitted as they were considered personal and might embarrass the participants in a group setting. After obtaining informed consent, two investigators (one English speaking and one Sinhala speaking) conducted the semi-structured interviews with the participant while digitally recording the interview. Focus groups were audio recorded and took about one hour to complete.

## Analysis

Following the completion of data collection all digital recordings were simultaneously translated into English and transcribed. A qualitative analysis methodology similar to that used by Brown et al [2] was implemented. For each question researchers picked out frequently occurring key words or phrases, as well as salient quotations. These key words were placed into an extensive bank of key words and themes, which was iteratively revised and analyzed throughout the process.

## Ethical Considerations

This study was approved by the Duke University Office of Research Support IRB and the University of Ruhuna Faculty of Medicine Ethics Committee.

## Results

### Chronic disease

Participants reported major health concern was chronic non-communicable illnesses. These included dermatitis, myopia, hypertension, asthma, diabetes, hypercholesterolemia, and arthritis. Four drivers reported a combination of two or more of the previously listed conditions. Only a minority of drivers suffered from serious chronic illnesses. It is notable that many of the chronic non-communicable disease reported are the result of lifestyle factors such as age, substance use, poor diet, and a sedentary lifestyle. It is unclear whether being a three-wheel driver is actually a risk factor for these conditions.

**Table II Sample Questions**

<p>1. What are some health problems that you have seen among auto-rickshaw drivers, including yourself? If yes...</p> <ol style="list-style-type: none"> <li>Did you have to miss work due to that illness?</li> <li>Did you get treatment? <ol style="list-style-type: none"> <li>Where?</li> <li>Did you have to pay for it?</li> <li>Were you satisfied with the services you received?</li> </ol> </li> </ol>
<p>2. Do you experience pain while driving?</p> <ol style="list-style-type: none"> <li>Where?</li> <li>Do other drivers complain of pain in the same areas?</li> </ol>
<p>3. Do you ever feel stressed at work?</p> <ol style="list-style-type: none"> <li>If yes... how do you cope with that stress</li> </ol>
<p>4. Do you smoke?</p> <p>If yes...</p> <ol style="list-style-type: none"> <li>How long have you been smoking?</li> <li>What do you enjoy about smoking?</li> </ol> <p>If yes or no...</p> <ol style="list-style-type: none"> <li>Is it common for three wheel drivers to smoke? <ol style="list-style-type: none"> <li>Why?</li> </ol> </li> </ol>
<p>5. Do you consume alcohol?</p> <p>If yes...</p> <ol style="list-style-type: none"> <li>What do you enjoy about drinking alcohol?</li> </ol> <p>If yes or no...</p> <ol style="list-style-type: none"> <li>Is it common for drivers to consume alcohol? <ol style="list-style-type: none"> <li>Why?</li> </ol> </li> </ol>
<p>6. Overall do you feel that drivers are healthy or unhealthy?</p>
<p>7. Is there anything else you feel I should know about auto-rickshaw driver health?</p>

The most common health complaint among participants was musculoskeletal pain. Of all the health concerns mentioned in the interviews and focused groups, musculoskeletal pain is the one most likely to be linked to occupation. Participants reported pain in the lower back, shoulders, and knees. They attributed this pain vibrations of the vehicle and staying in the same position for many hours. Many drivers reported that having one wheel in front caused stronger vibrations to be transferred to the driver's body, especially true for older models of three-wheelers. "It feels uncomfortable if the vehicle is an old one. If the shock absorbers are working well we don't feel any discomfort. If the vehicle is good there's no discomfort." Drivers are dependent on the mechanical integrity of their vehicle to be physically at ease while doing their job.

### Substance Use

Participants reported that smoking is part of three-wheel driver public social interaction. About half of the drivers reported smoking themselves but all stated that smoking was nearly universal among other drivers. In fact the first participant interviewed emphatically stated "About 98% of drivers smoke or drink." Some participants observed that smoking was a habit of older drivers. One participant observed, "Younger drivers don't smoke too much."

Virtually all the drivers stated that alcohol consumption was common among three-wheel drivers. "Most people drink beer at least. Non-drinkers are rare. At least 90% of drivers drink." This openness about alcohol consumption came with qualifications. According to participants, it was uncommon for drivers to be problem drinkers and even less common for them to drink on the job. When asked when it was most common for drivers to

consume alcohol one participant responded "usually at parties at home or when getting together with friends." Many other drivers echoed this perception of alcohol as something reserved for social settings. Some drivers noted that some of their coworkers used alcohol to relieve the physical tensions of work namely fatigue and pain. "That's why we drink- due to body aches." Interestingly, more participants affirmed this observation that drinking more commonly happens to relieve physical stress rather than emotional stress. It appears that to these drivers alcohol is more of a social relaxant than a means of numbing emotional pain.

Participants did not believe that drunk driving was common among their colleagues, but it did happen. Participants frequently cited drunk driving as an important cause of accidents. According to participants this was true mainly for younger three-wheel drivers. "It's not common but occasionally there are some young people that drive recklessly."

### Work Related Stress

Participants were asked whether they had experienced emotional stress at work and, if they had, the severity of that stress. Emotional stress, and the physical side effects thereof, is a major risk factor for a number of chronic diseases. Most drivers stated that as long as fares, and therefore income, were sufficient they were generally satisfied with their job.

Many drivers expressed concern about the inconsistency of fares, particularly in the tourist low season. An even stronger perceived threat was competition from increasingly developed public transportation and increasingly common family vehicle ownership. "Now every family has a motorbike or three-wheeler. Because of that our income is in a very difficult position." Another participant complained that a new bus line in his neighborhood had decreased his fares dramatically. Three-wheel drivers reported that low income was stressful because it placed their families' well-being in jeopardy. "My family has five members and out of those five the main income source is me... I have to allocate my income for their food, garments, and medicine. So I can't be satisfied with my income." The final source of stress was the fact that drivers had no hope of income after retirement.

### Discussion

The most frequent health complaint among the participants was musculoskeletal pain. Three-wheel drivers' joints are under constant stress throughout the day. While driving they are exposed to prolonged bodily vibration on Sri Lanka's bumpy roads, and while waiting for fares they must crouch in one position for extended periods of time. The other common chronic illnesses, which participants mentioned included respiratory illness, hypertension, diabetes, and high cholesterol. Participants in this sample often stated in interviews that they believed that substance abuse and stress were important contributors to these illnesses.

The participants from Galle had many of the same risk factors for cardiovascular disease that [10] observed among three-wheel drivers in Delhi. These include smoking, and a high degree of work related stress. Participants reported that almost all of their colleagues smoked, drank, or both.. These modifiable risk factors could be an area in which to intervene and further research is needed. Participants offered insights that are consistent with [7,8] work on smoking and drinking among Sri Lankan men in general. By forming social gatherings centered on consumption of alcohol and tobacco, drivers are expressing their masculinity and membership in a group. As the sole income earner for their families, some drivers reported that when their income was low, they felt that they were inadequate husbands and/or fathers. The desire to prove that they are following their duties as men contributes to three cardiovascular risk factors among Galle-based three-wheel drivers: stress, smoking, and drinking.

**Table II Main health problems and risk factors reported**

Health Topic	Major Findings
Chronic Illness	<ul style="list-style-type: none"> <li>• Most common NCD's: hypertension, hypercholesterolemia, diabetes</li> <li>• Other NCD's: Dermatitis, myopia, asthma, and arthritis</li> </ul>
Musculoskeletal Pain	<ul style="list-style-type: none"> <li>• Most frequently reported health problem</li> <li>• Pain in lower back, knees, shoulders, hands</li> <li>• Due to bodily vibration while driving, sitting in same position while waiting for fares</li> </ul>
Substance Use	<ul style="list-style-type: none"> <li>• Consumption of alcohol and tobacco nearly universal</li> <li>• Cope with physical and emotional stress</li> <li>• Social activity</li> </ul>
Work-Related Stress	<ul style="list-style-type: none"> <li>• Almost all reported some level of stress at work</li> <li>• Economic concerns tend to be greatest sources of stress</li> </ul>

### Limitations

Given its qualitative study design, this project does not purport to be widely generalizable. Rather it aimed to gain deeper insight into the health needs of this large, unique group of workers. Some questions may have been inadequately responded to as a result of variable rates of responsiveness and comprehension of questions among the participants. It is likely that participants under reported their use of alcohol, tobacco smoking, and number of accidents. Finally, due the design and scope of this

purpose clinical examinations to detect the existence and severity of health conditions were not performed.

### Conclusion

This qualitative health survey of three-wheel driver's health is the first of its kind. We found that three-wheel drivers experienced a high degree of both substance use and work related stress. Additionally participants reported musculoskeletal pain, hypertension, diabetes, high cholesterol, and respiratory illness. The stress, substance use and chronic disease reinforced each other in a negative cycle. More research is needed to understand the interaction between stress, substance use, and chronic illness in these drivers. This information should serve as a foundation for development of policy, legislative, and educational interventions to improve the safety of the three wheelers and the drivers.

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