CrossRef DOI of original article:

Assessment of Body Mass Index (BMI) and General Health Status of Male Auto-Rickshaw Drivers in Garia, Kolkata

Dr. Sampa Mitra

Received: 1 January 1970 Accepted: 1 January 1970 Published: 1 January 1970

Abstract

Background: In India, auto-rickshaw is one of the main modes of public transport in urban and semi-urban areas; however, auto-rickshaw drivers often suffer from various nutritional deficiencies.Objective: The objective of this work is to assess the body mass index (BMI) and the general health status of the auto-rickshaw drivers of the Garia Southern Avenue auto-rickshaw stand (in Kolkata).Method: To achieve this objective, a cross-sectional study has been undertaken, whereby data have been collected in February-July 2018, regarding duration of work, nature of addiction, ownership pattern, general clinical status, BMI and body fat percentage, of 157 male autorickshaw drivers, attached to the aforesaid stand, and belonging to the age-group of 18-55 years. Subsequently, the binomial test has been conducted at 5

Index terms— auto-rickshaw driver, Kolkata, body mass index, health status, binomial test, cross-sectional study.

1 Introduction

n India, auto-rickshaw is one of the main modes of public transport in urban and semi-urban areas. In Kolkata also, auto-rickshaw services are there. However, auto-rickshaw drivers often suffer from various occupational hazards. Their lifestyle is not quite conducive to health, and they often experience irregularity of meals, among other things (1). Prolonged hours of work often leads to insufficient sleep and less physical activity (2). Besides, often there is a high prevalence of smoking and drinking among the autorickshaw drivers. All these factors may contribute to various health-related problems.

Author: Director-Professor, Deptt. of Epidemiology, AIIH & PH, Kolkata. Current Residential Address: BB-35/5, Salt Lake City, Kolkata-700064. e-mail: sampamitra2003@yahoo.co.in

2 I

The objective of this work is to assess the body mass index (BMI) and the general health status of the auto-rickshaw drivers of the Garia Southern Avenue auto-rickshaw stand (in Kolkata).

And, for this assessment, the binomial test has been conducted at 5% level of significance.

Before undertaking this study, a brief literature survey has been conducted. It has been found that a number of researchers have worked on the social condition, the economic status, and the health picture of the auto-rickshaw drivers in various cities of India. However, studies on the status of the auto-rickshaw drivers of Kolkata, are comparatively rare, and whatever articles I have come across, on this topic, do not cover the general health status of the auto-rickshaw drivers. As for example, one such work (by Agarwal et al.) focuses on the high prevalence of low back pain among the auto-rickshaw drivers of Kolkata (3). Now, the general health status of the auto-rickshaw drivers of Kolkata, is an important component of medical research, from which one may be able to draw significant and interesting inferences. And, this paper attempts to shed some light on this topic.

3 II.

4 Materials and Methods

It is a cross-sectional study conducted between February 2018 and July 2018, on 157 male autorickshaw drivers, belonging to the age-group of 18-55 years; these drivers are attached to the Garia Southern Avenue auto-rickshaw stand. (The necessary research and ethical clearances have been taken from the institution to which I was attached during the study.) Only those auto-rickshaw drivers who are willing to participate, have been included in this study; and before inclusion, the nature and the purpose of the study have been explained to them in detail. In other words, informed consent has been taken from the autorickshaw drivers before including them in the study.

The sample size (s) has been calculated according to equation-1: a significant number of auto-rickshaw drivers belong to the relevant category.

The formula (4) for obtaining the p-value (p1) is depicted in equation-2: 2 where, n=total number of auto-rickshaw drivers included in the study=157; X=expected number of successes=n/2=78.5?79; p=observed proportion of success=proportion of autorickshaw drivers, belonging to a particular category; q=observed proportion of failure=proportion of autorickshaw drivers, not belonging to the relevant category.

If p1<0.05, then it can be inferred that a significant number of auto-rickshaw drivers belong to the pertinent category (i.e., the null hypothesis is rejected and the alternative hypothesis is accepted); otherwise, the number of auto-rickshaw drivers, belonging to the relevant category, is not significant (i.e., the null hypothesis is accepted).

If p<0.5 (and consequently, q>0.5), then the value of p1 may result in wrong inference with regard to significance. Therefore, in such a situation (where p<0.5 and q>0.5), p and q are both taken as approximately (since n is an odd number) equal to 0.5, only for the sake of calculating p1. = 2 n! (n?X)! X! p X q (n?X)

p=prevalence of malnutrition among adult Indian males=28.6%; q=(100-p)=71.4%; After calculation, one will get s=78.41. Considering a design effect of 2, the final sample size becomes 78.41 X 2=156.82?157.

The sample (of size=157) has been collected on the basis of simple random sampling, from 1128 male auto-rickshaw drivers (belonging to the age-group of 18-55 years), associated with the Garia Southern Avenue auto-rickshaw stand.

A pre-designed and pre-tested questionnaire has been used to collect the relevant information from the auto-rickshaw drivers through interview (the questionnaire has been validated by pre-testing it among a few auto-rickshaw drivers belonging to the sample). Besides, the drivers have been subjected to thorough clinical examination.

Subsequently, the collected data have been tabulated, the binomial tests have been performed (at 5% level of significance) on them, and the results of the tests have been interpreted.

Binomial test is applied when an experiment has two possible outcomes viz., success and failure, and the probability of success is known. A binomial test is conducted to find out whether the observed result differs significantly from the expected one.

Here, the null hypothesis is that a significant number of auto-rickshaw drivers do not belong to the pertinent category, and the alternative hypothesis is that The method employed in this work, is shown in fig. -1. d=absolute error=10%.

5 III.

6 Results

The duration of work, nature of addiction, ownership pattern, general clinical status, and BMI and body fat percentage, of the auto-rickshaw drivers, are shown respectively in tables-1, 2, 3, 4 and 5.

7 Table-1: Working status of the auto-rickshaw drivers (n=157)

In table-1, the results of the binomial tests show that a significant number of auto-rickshaw drivers are working more than 8 hours/day (but not more than 12 hours/day), but the number of auto-rickshaw drivers, working more than 6 days/week (i.e., 7 days/week), is not significant. In table-2, the outcomes of the binomial tests depict that a significant number of auto-rickshaw drivers have the habit of smoking and chewing tobacco, but the number of auto-rickshaw drivers who are addicted to alcohol, is not significant.

8 Table-5: BMI and body fat percentage of the auto-rickshaw drivers (n=157)

In table-4, according to the outcomes of the binomial tests, a significant number of auto-rickshaw drivers have good appearance, normal angles of mouth, normal tongue colour, normal gum, no fluorosis in teeth, normal hair condition, normal skin appearance, no oedema, and no pallor. the binomial test results, in table-4, also show that the number of autorickshaw drivers, having teeth with caries, is significant.

In table-5, as per the results of the binomial tests, a significant number of auto-rickshaw drivers have BMI in or above the normal range (18.50 kg/m 2 -24.99 kg/m 2), and normal or higher than normal body fat percentage.

IV.

9 Discussions

The following inferences can be drawn from tables-1, 2, 3, 4 and 5:

? A significant number (66.2%) of auto-rickshaw drivers, attached to the Garia Southern Avenue auto-rickshaw stand, work for a long time. ? A significant number of drivers are addicted to tobacco (both smoking (96.2%) and chewing (66.2%) forms), but not alcohol. ? A significant number (63.7%) of drivers own the auto-rickshaw; this fact indicates that the economic condition of a significant number of drivers is not bad (it is a qualitative idea). ? A significant number of drivers enjoy good health (except the occurrence of caries) (as per the general clinical assessment), in spite of having long working hours. This is most probably because of their not-so-bad economic condition which allows them to get sufficient food of acceptable quality. ? A significant number of drivers have normal or higher than normal BMI (80.9%) and body fat percentage (99.4%). Thus, there is a possibility that a significant number of drivers is either overweight/obese currently, or likely to become overweight/obese in the near future. This is most probably because of their not-so-bad economic condition (as stated above), and also the nature of their occupation (which demands the drivers to remain in sitting position for a long time).

Hence, this study shows that a significant number of auto-rickshaw drivers, attached to the Garia Southern Avenue auto-rickshaw stand, have not-verybad economic condition, and enjoy good health (except the occurrence of caries), despite long hours of work, and addiction to tobacco; and, a significant majority of them are either overweight/obese currently, or likely to become overweight/obese in the near future. Now, it will be prudent to take a look at the findings of some of the other researchers working on auto-rickshaw drivers.

Yesurajan et al. found that smoking, alcohol abuse, and obesity are some of the common health risk factors of the auto-rickshaw drivers of Madurai (5); in the current study, however, alcohol abuse is not a problem for a significant number of drivers (only 14.6% have been found to consume alcohol).

Gupta et al. undertook a study on the autorickshaw drivers of Mumbai, and found that only 15% of the study population are smokers (6); in contrast, I have found that a significant number (96.2%) of auto-rickshaw drivers are addicted to smoking.

Chougule et al. worked on the auto-rickshaw drivers of Kolhapur, and found that most of them enjoy good health (7); this finding is similar to what I have observed in the current work.

The study of Debbarma et al. on the autorickshaw drivers of Agartala, shows that majority of the study population (73.81%) were suffering from caries (8); I have also found that a significant number (63.1%) of auto-rickshaw drivers have teeth with caries.

Jain et al. conducted research on the autorickshaw drivers of Gwalior, and found that among the study population, prevalence of overweight was 26 % and central obesity was 6% (9); on the contrary, in the current study, the results indicate that a significant number of drivers are either overweight/obese currently, or likely to become overweight/obese in the near future.

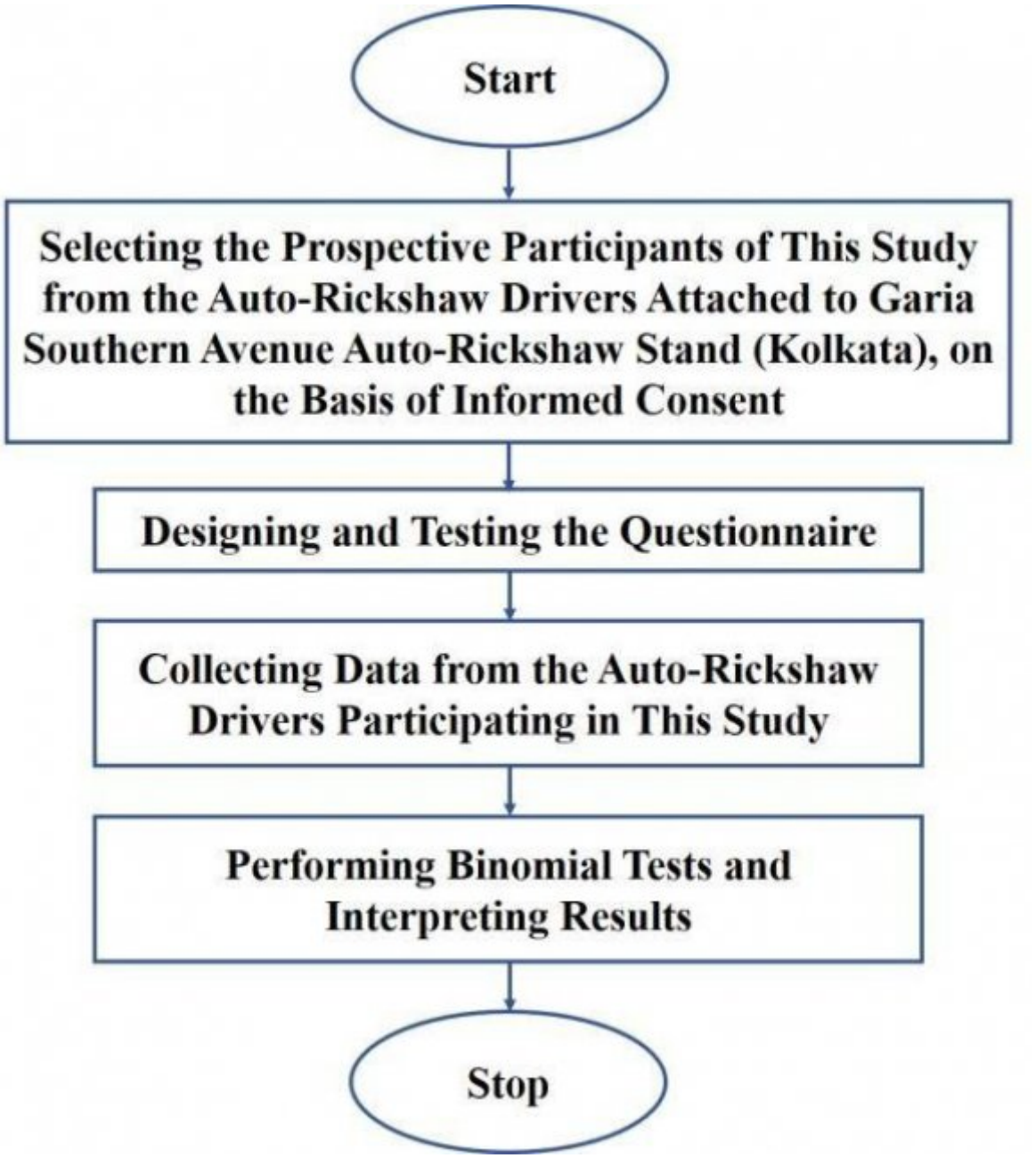
V.

10 Conclusions

This study has attempted to assess the BMI and the general health status of the auto-rickshaw drivers, attached to the Garia tests conducted on these data, it can be concluded that a significant number of auto-rickshaw drivers enjoy notso-bad economic condition, and good health, in spite of having long working hours, and being addicted to tobacco; however, there is a probability that they are either overweight/obese currently, or likely to become overweight/obese in the near future.

A plus point of this study is that it has been able to draw the above conclusions without performing any expensive and/or complicated medical examination.

However, if data regarding the respiratory system, the musculo-skeletal system, and some general health parameters like blood pressure and blood sugar level, of the auto-rickshaw drivers, were also collected and analysed, a more or less comprehensive idea regarding the health status of the drivers could have been obtained. Also, if auto-rickshaw drivers from other auto-rickshaw stands were also included in the study, it would have yielded a more general picture regarding the health status (of the auto-rickshaw drivers of Kolkata). If possible, these assignments can be taken up in future.



1

Figure 1: Fig.- 1 :

-

Addiction type	Yes	No	p1
Smoking	151 (96.2%)	6 (3.8%)	0
Chewing of tobacco	104 (66.2%)	53 (33.8%)	2.9429X10 -5
Consumption of alcohol	23 (14.6%)	134 (85.4%)	0.1274
	79 (50.3%) (for calculating p1)	78 (49.7%) (for calculating p1)	

Figure 2: Table - 2

-

Duration of work	Yes	No	p1
Working more than 6 days/week	87 (55.4%)	70 (44.6%) (number of drivers working 6 days/week)	0.0563
Working more than 8 hours/day (but not more than 12 hours/day)	104 (66.2%)	53 (33.8%) (number of drivers working 8 hours/day)	2.9429X10 -5
Ownership	Yes	No	p1
Owner of the auto-rickshaw	100 (63.7%)	57 (36.3%)	3.6747X10 -4

In table-3, the binomial test result shows that a significant number of auto-rickshaw drivers own the auto-rickshaw.

Table-4: General clinical assessment of the auto-rickshaw drivers (n=157)

Criterion	Yes	No	p1
Good appearance	157 (100%)	0 (0%)	0
Normal angles of mouth (i.e., no ulcer at the angles of the mouth)	157 (100%)	0 (0%)	0
Normal tongue colour	136 (86.6%)	21 (13.4%)	2.2058X10 -27
Normal gum	146 (93.0%)	11 (7.0%)	6.2128X10 -47
Absence of fluorosis in teeth	157 (100%)	0 (0%)	0
Teeth with caries	99 (63.1%)	58 (36.9%)	6.2498X10 -4
Normal hair condition	157 (100%)	0 (0%)	0
Normal skin appearance	143 (91.1%)	14 (8.9%)	1.6591X10 39 -
Absence of oedema	157 (100%)	0 (0%)	0
Absence of pallor	136 (86.6%)	21 (13.4%)	2.2058X10 -27

Figure 3: Table - 3

Status	Yes	No	p1
BMI (in kg/m 2) in or above normal range (18.50-24.99)	127 (80.9%)	30 (19.1%)	1.0328X10 -17
Normal or higher than normal body fat percentage (body fat percentage data have been collected using body fat analyser)	156 (99.4%)	1 (0.6%)	0

Figure 4:

.1 Acknowledgements

The author is deeply indebted to Ms. Poulami Basu, MSc (Applied Nutrition) student (session: 2016-18), AIIH & PH, Kolkata, for collecting the data and helping in the analysis.

Besides, the author wants to express her gratitude to the auto-rickshaw drivers (who have participated in this study), attached to the Garia Southern Avenue auto-rickshaw stand, for their cooperation in the data collection process.

.2 Source of Funding: Personal Source

Conflict of Interest: The author certifies that there is no conflict of interest, involved in this study.

[Jain and Yuwane ()] 'A Study of Cardiovascular Disease Risk Factor Among Auto: Rickshaw Drivers in Gwalior City, M.P'. S Jain , P Yuwane . *Int J Med Heal Res* 2018. 4 (4) p. .

[Mitra and Chakraborty ()] 'A Study on the Socio-Demographic and the Clinical Profiles, Along with Some Management Indicators, of the MDR TB Patients at the Domjur Block'. S Mitra , B Chakraborty . *J Bacteriol Infect Dis* 2020. (Internet)

[Chougule et al. ()] 'A Study the Problems of Auto Rickshaw Drivers in Kolhapur City Using Statistical Tools and Techniques'. P S Chougule , T S Kurane , S V Patil , D M Kamble , B M Kumbhare , S K Waghamare . *EPRA Int J Multidiscip Res* 2020. 6 (11) p. .

[Yesurajan and Indra ()] 'Common Work Related Health Problems of Auto Rickshaw Drivers in India-Causes and Strategies'. M Yesurajan , T Indra . *Int J Appl Res* 2017. 3 (6) p. .

[Mahadik et al. ()] 'Cross-Sectional Study of Health Status of Auto Rickshaw Drivers in Vashi'. V J Mahadik , P Waingankar , S Anjenaya , S Sanjeev , K Mali . *MGM J Med Sci* 2017. 4 (4) p. .

[Debbarma and Mitra ()] 'Occupational Health Problems of the Auto Rickshaws Service Providers in Agartala City: A Case Study of Nagerjala Motor Stand'. D Debbarma , S Mitra . *Int J Curr Res Rev* 2017. 9 (22) p. .

[Agarwal et al. ()] 'Prevalence and Risk Factors of Low Back Pain among Auto-Rickshaw Drivers in Urban Kolkata'. S Agarwal , A Pradhan , Ray Chaudhuri , G Das , S . *India. Int J Curr Res Acad Rev* 2017. 5 (5) p. .

[Gupta and Pawar ()] 'Study of Respiratory Health in Auto Rickshaw Drivers in Mumbai'. D Gupta , S Pawar . *Int J Adv Res* 2020. 8 (4) p. .

[Melwani et al. ()] 'Study to Assess the Socio-Demographic Profile, Health Status and Working Conditions of Auto-Rickshaw Drivers in Bhopal'. V Melwani , A Priya , M Toppo , S Sethia , A Khan , S Melwani . *Int J Community Med Public Heal* 2018. 5 (4) p. .