

Risk of in-itinere accident in primary health care professionals

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RESEARCH

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ABSTRACT

Background

Traffic accidents represent a priority for public health since they are responsible for high mortality tolls, elevated economic costs and a significant social impact. Ecuador ranks as the seventh country in the World with a higher mortality rate.

Aims

To know the risk level of in-itinere accidents for workers of a primary care facility.

Methods

Descriptive transversal study through the application of a basic survey from 136 sanitary and non-sanitary professionals.

Results

The means to commute used by workers corresponds to public transportation (57.4 per cent) and automobile (26.5

per cent), being the time invested in traveling to work is greater than 30 minutes. A statistical significant relationship can be observed between the transportation mean used to commute to the medical center and the time invested with the ending score of the risk to suffer a TA ($p<0.05$) for workers.

Conclusion

A necessity to establish road safety programs rises to control such risk factors that influence the possibility to suffer a commuting accident for the sanitary personnel.

Key Words

Traffic accident, commuting to work risks, primary care, professionals, road safety

What this study adds:

1. What is known about this subject?

Approximation to find the level of commuting accidents risk for sanitary workers.

2. What new information is offered in this study?

A basic questionnaire to establish the risk level of commuting accidents.

3. What are the implications for research, policy, or practice?

The results of the current study will allow establishing a road safety program in the Primary Care Medical Center.

Background

Traffic Accidents (TA) are the leading cause of death in the world. They are becoming a priority problem in public health for the World Health Organization due to the rise in mortality rates, and the economic costs and social impact that it has generated in the last years.¹

According to the Pan-American Health Organization, Ecuador holds the second place in Latin America for traffic

accidents and ranks seven for its mortality rate due to TA worldwide,² registering during the period of 1998 to 2015 a total of 29,148 fatalities.³ The Metropolitan District of Quito is the second city in the country with the greater number of registered accidents (10,777), injured victims (5,984) and fatalities (334) due to TA in 2016.⁴

In the last years, the number of workers that use their own vehicles and other means of transportation to commute to their workplace have increased. In this sense, in-itinere accidents have become a priority problem in safety and occupational health for companies.^{5,6} This problem is evidenced in the statistics of the General Insurance of Work Risk of the Ecuadorian Institute of Social Security (IESS);⁷ in 2013, the commuting accidents represented 5.1 per cent of the total work accidents reported, increasing to 20.9 per cent for 2016.

In the Ecuadorian labor context, an in-itinere accident is legally recognized by IEISS, to be qualified as a labor accident it is mandatory to evidence the chronological relationship between the hours of entry/exit of the worker from his home to his workplace and vice versa.⁸ The need surges to evaluate the risk factors that can have an incidence in this type of work accidents with the object to establish control measures and road safety programs.

As far as primary care professionals, even though they represent a group that perceives this risk, diverse studies indicate a high incidence of accidents on their way to or from work. The risk to be involved in a TA is tightly related to the distance and time invested in the commute, in addition to the transportation mean used from their house to their workplace.⁹⁻¹¹

Currently, there is a great diversity of questionnaires employed to evaluate the risk to suffer a TA. Nevertheless, many of them are complex due to the formulation of the questions and the valuation scale used for the answers, limiting the participation rate and causing a bias position of the surveyed.¹²

In Ecuador, it becomes difficult to obtain studies related to commuting accidents, which limits the analysis to establish concrete preventive actions in this area. Nevertheless, due to the rise in the working population, Automobile Park and traffic accident frequency in general,¹³ we can infer a risk increase of the labor risk for primary care professionals of Ecuadorian companies.

The objective of the current study was to learn the level of

risk of in-itinere accidents of workers of a primary care facility, thru the application of a basic questionnaire, allowing to identify such risk factors in terms of the mean of transportation and the time invested in the commute from the worker's house to his workplace and vice versa.

Method

Design and participants

Transversal descriptive study of a private primary care medical center in the city of Quito, Ecuador. The population included all sanitary and non-sanitary workers (n=197) that were part of the payroll of the medical center in August 2016.

Instrument and variables

In order to develop a tool that will permit to identify the TA risk for the population of the study, we identified beforehand the questionnaires employed to evaluate the level of risk to suffer traffic accidents and the proposed criteria from other studies that have road safety as the result from the relationship between driver, vehicle and commuting time, being this last one an exposition factor.¹¹⁻¹⁴

Finally, a survey was designed with 10 questions grouped in two blocks; the first one (Questions 1 to 6) gathers socio-demographic and occupational information, transportation means and time of commute from home to work; the second block (Questions 7-10) to be filled only by those workers that use a car and/or motorbike (Question 5) as their transportation mean, to identify risk factors in terms of driving experience years, vehicle periodic maintenance and year, and lastly, if the worker has been involved in any traffic accident in the last year. The questionnaire, original version, is included as an Annex.

Being an anonymous and voluntary questionnaire, and in order to avoid bias answers, it was determined not to include work position in the questionnaire in addition to other socio-demographic or labor variables.

Each answer had a score assigned that ranged between 0 and 5 (0 non determining factor, 1 very little determining factor, 2 little determining factor, 3 somewhat determining factor, 4 determining factor and 5 very determining factor). From the total added points, a final score is established and its corresponding level of risk being: 0–5 a low in-itinere risk, 6–10 a moderate risk, 11–15 an important risk and 16–20 a high risk.

The questionnaire was self-administered to all the workers

by the Chief of Nurses. 168 surveys were received, 3 workers chose not to participate and 29 surveys were invalidated since they did not comply with the appropriate quality criteria set and due to lack of information in some of the questions.

To evaluate the reliability of the questionnaire an Cronbach's alpha test was applied, which resulted in an acceptable coefficient of $\alpha=0.726$.¹⁵

Statistical analysis

All the questionnaires were registered in a Microsoft Excel database and were analyzed using the Statistical Package for the Social Sciences (version 23). For the statistical analysis, absolute and relative frequencies were employed. A relationship was established between the variables of the study and the final level of in-itinere accident risk thru the Chi square variable of Pearson ($p<0.05$).

Results

Table 1 shows the distribution of the surveyed workers according to sex, age and time working at the primary care medical centre. There is a prevalence of women over men, with an average age of 35 ± 8.4 and 36 ± 10.8 respectively.

With respect to the labor journey, there are no differences between the morning shift (7:00–13:00h) and the afternoon shift (13:00–19:00h) for the workers who participated in the survey. 61.8 per cent ($n=84$) stated to have more than one year working in the medical center.

The most commonly employed mean of transportation used by the workers to commute (home-medical center-home) is public transportation (57.4 per cent) and car (26.5 per cent), being the time invested to get to their workplace greater than 30 minutes for the majority of workers ($n=115$; 84.6 per cent).

With respect to the workers that stated to use on a daily basis their automobile ($n=36$) and/or motorcycle ($n=4$) as their mean to commute to the medical centre (Table 2), 75 per cent of the respondents stated to have more than 4 years driving experience.

Half of the workers responded not to know or not to perform a regular check of their vehicles. 72.5 per cent of the vehicles driven by the medical center workers are over 5 years old.

When they were asked if they had been involved in any traffic accidents in the last year, 42.5 per cent of the

workers responded affirmatively; where men positive answers ($n=10$; 58.8 per cent) where greater than women's ($n=7$; 30.4 per cent).

Finally, the final score distribution on the risk level of suffering an in-itinere accident was as follows: 10.3 per cent of the medical center employees are at high risk (Score 16–20 points), 17.6 per cent have an important risk (11–15 points), 64.4 per cent face a moderate risk (6–10 points) and last but not least, 6.6 per cent are exposed to a low risk (0–5 points).

There is a statistically significant relationship between the mean used to commute to the medical center and the time invested by the workers in the travel with the final scoring risk of being involved in a TA ($p<0.05$).

Moreover, the final scores that show a greater level of risk are tightly associated with the years of driving experience, maintenance and age of the vehicle used, and involvement in traffic accidents for those employees that use an automobile and/or a motorcycle to commute to the medical center ($p<0.05$).

Discussion and Conclusion

From the results of the study, even if public transportation (bus) is the predominant mean to commute to work and even if it is considered as the safest transportation mean in developed countries, for Ecuador, in 2015 this mean of transportation represented 5.5 per cent (118 fatalities) of the deaths caused by traffic accidents nationwide, mainly within the urban framework and crossings.³

Furthermore, the workers that walk to the medical center, despite having a low risk score on the questionnaire (Score 2 – non determining factor) are exposed to an additional risk factor as pedestrians. The number of deaths in Ecuador due to pedestrian run overs or hits was 29.4 per cent (578 fatalities),¹³ which shows a high incidence and represents an important factor of risk.

Despite the fact that the city of Quito has a trolley rail line that runs from the North to the South of Quito, it is not enough for the total people that use this service daily to commute to work, which not only produces pollution in the city but also leads to the use of other type of vehicles, increasing this way the level of risk.^{16,17}

As far as the time invested commuting, the exposition time is a factor that has a significant incidence to suffer in-itinere accidents; 74.6 per cent of the employees stated to take

over 30 minutes in going and coming back from home to work.

A significant statistical association is evident between the level of risk to suffer a commuting accident and the driving experience, vehicle maintenance and age, and having been involved in a traffic accident.

There are several limitations in this study. It is possible that the invalidated surveys for not meeting the required quality criteria and the lack of information could alter the global level of risk of TA for the studied population.

There are also inherent limitations with respect to the employed instrument, mainly due to the fact that it does not include other variables related with the perception and attitudes of the driver that could permit a more in depth analysis,¹⁸⁻²⁰ Even if the reliability of the questionnaire has been validated which permitted to determine quickly the level of TA risk, it is necessary to replicate with a bigger population.

The need arises to establish programs of road safety to control such risk factors that influence the possibility to suffer in-itinere accidents for the sanitary staff.

Finally, the study of road safety education and its results before the positive impact that it can cause for occupational safety, can foster the formation of university professionals as a transversal axe from its integral formation. It is not just about dominating norms and rules, but also about creating a road safety education culture that favors the development of behavioral modes tight to their citizen and professional duties.

What is stated above is an expression to reach an individual and collective learning in order to protect the physical integrity, to enrich the construction of its citizenship, assume their rights and responsibilities facing the risk situation that can endanger your life and the life of others.

The university must seek or contribute with a citizen conscience where respect towards others is privileged and road safety as a common good.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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ETHICS COMMITTEE APPROVAL

The ethics approval was obtained from the Editorial Committee of SEK International University, Ecuador.

Table 1: Characteristics of the respondents, mean and commute time (n=136)

	Men (n=50)		Women (n=86)		Total (n=136)		p*
	n	%n	n	%n	n	%n	
Age							0.404
16-24 years old	5	10.0%	14	16.3%	19	14.0%	
25-54 years old	42	84.0%	69	80.2%	111	81.6%	
> 54 years old	3	6.0%	3	30.5%	6	4.4%	
Work Shift							0.529
Morning ^a	34	68.0%	42	48.8%	76	55.9%	
Afternoon ^b	16	32.0%	44	51.2%	60	44.1%	
Time of employment							0.511
< 12 months	20	40.0%	32	37.2%	52	38.2%	
12-36 months	11	22.0%	29	33.7%	40	29.4%	
> 36 months	19	38.0%	25	29.1%	44	32.4%	
Transportation Mean							0.000
Walking	8	16.0%	10	11.6%	18	13.2%	
Automobile	16	32.0%	20	23.3%	36	26.5%	
Motorcycle	1	2.0%	3	3.5%	4	2.9%	
Public Transportation	25	50.0%	53	61.6%	78	57.4%	
Commuting Time							0.009
< 30 minutes	7	14.0%	14	16.3%	21	15.4%	
> 30 minutes	24	48.0%	30	34.9%	54	39.7%	
≥ 1 hour	19	38.0%	42	48.8%	61	44.9%	

^aSchedule of Work Shift 07:00 to 13:00h

^bSchedule of Work Shift 13:00 to 19:00h

*p=Chi square (p<0,05), In-itinere accidents' level of risk

Table 2: Results from workers that use a car and/or a motorcycle (n=40)

	Men (n=17)		Women (n=23)		Total (n=40)		p*
	n	%n	N	%n	n	%n	
Driving Experience							0.000
< 1 year	1	5.9%	2	8.7%	3	7.5%	
1-3 years	3	17.6%	4	17.4%	7	17.5%	
4-10 years	8	47.1%	11	47.8%	19	47.5%	
> 10 years	5	29.4%	6	26.1%	11	27.5%	
Vehicle Maintenance							0.000
No	2	11.8%	7	30.4%	9	22.5%	
Yes	8	47.1%	12	52.2%	20	50.0%	
Unknown	7	41.2%	4	17.4%	11	27.5%	
Age of vehicle							0.000
< 5 years	5	29.4%	6	26.1%	11	27.5%	
5-10 years	11	64.7%	13	56.5%	24	60.0%	
> 10 years	1	5.9%	4	17.4%	5	12.5%	
Traffic Accidents							0.000
No	7	41.2%	16	69.6%	23	57.5%	
Yes	10	58.8%	7	30.4%	17	42.5%	

*p=Chi square (p<0,05), In-itinere accidents' level of risk

Annex Questionnaire

P1 Sex
 Man Woman **No Points**

P2 Age
 2 16-24 years old 1 25-54 years old 3 > 54 years old

P3 Work Shift
 1 Morning Shift 2 Afternoon Shift 3 Night Shift

P4 Time at employment
 1 <12 months 2 12-36 months 3 >36 months

P5 Transportation Mean home-work-home commute
 2 Walking 4 Car 5 Motorcycle
 3 Bicycle 0 Public Transportation

P6 Daily Time invested to commute (P5)
 1 < 30 minutes 2 > 30 minutes 3 > 1 hour

** If answered affirmatively **Car** and/or **Motorcycle** (P5 Transportation Mean home-work-home), answer the following questions:*

P7 Driving Experience
 3 <1 year 2 1-3 years 1 4-10 years 0 >10 years

P8 Does the vehicle have periodic check-ups (maintenance)
 0 Yes 2 No 1 Unknown

P9 Vehicle Age
 0 < 5 years 1 5-10 years 2 >10 years

P10 Have you been involved in a traffic accident in the last year?
 2 Yes 0 No

Thank you for your participation

Score	In-itinere Accident Risk Valuation	LEVEL
0 a 5	The in-itinere accident risk is low, but risk exposition exists.	LOW
6 a 10	It is important to control such factors that have incidence in the possibility to suffer an in-itinere accident.	MODERATE
11 a 15	Risk factors that influence the possibility to suffer an in-itinere accident exist. Analyze what they are and take measures.	IMPORTANT
16 a 20	Take measures immediately.	HIGH