Original articles

Facial trauma and background level: a study on the population's perspective

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ABSTRACT

Purpose: to verify the population's understanding on facial trauma, according to their level of schooling.

Methods: an observational, cross-sectional, quantitative, documentary study conducted, based on 852 interviews carried out in two Brazilian state capitals. The association between the levels of schooling and varied knowledge of facial trauma was investigated. The data were analyzed with Pearson's chi-square test or Fisher's exact test, with a margin of error of 5%.

Results: there was a statistically significant association between the participants' schooling and their understanding on the consequences of trauma in: functions (p = 0.001), mouth mobility (p = 0.005), and dental issues (p = 0.003). In the most affected population, schooling was also associated with youth (p = 0.001) and adults (p = 0.044). Regarding causes, there was association with falls (p = 0.034) and traffic accidents (p = 0.034). There was association with bikers (p = 0.016) and motorcyclists (p = 0.001) as the population with greater propensity. Schooling was associated with all the professionals. Concerning the consequences to the victim's life, there was association also with general health (p = 0.049), household chores (p = 0.001), and social life (p = 0.001). Recklessness was the only cause with an association (p = 0.004). Schooling was associated with previous knowledge of trauma (p = 0.001).

Conclusion: their understanding on the consequences of trauma, most affected population, main causes, professionals involved in the treatment, repercussion for people's lives, and previous knowledge of the subject increased along with the levels of background.

Keywords: Speech, Language and Hearing Sciences; Maxillofacial Trauma; Public Health; Educational Status; Accidents, Traffic

INTRODUCTION

Craniofacial trauma can be defined as a local lesion in the region of the face, in which the integrity of the anatomical tissue is compromised. These traumas are characterized by a significant diversity of lesions that can affect various types of tissues, as soft ones, bones, teeth and scalp[1].

The etiology of facial trauma is multifactorial and is associated with sociodemographic and cultural conditions[2]. The most frequent cause of these lesions is traffic accidents, followed by interpersonal aggression and falls[1-5]. In automobile collisions, the motorcycle is the vehicle that most causes this type of lesion in the population[2,3]. However, the helmet, when adequately used, prevents possible fractures and brain lesions resulting from accidents[6]. The time with the highest rate of traffic accidents is at night, from 6:00 p.m. to 11:59 p.m., with the highest percentage on the weekends. This fact can be explained by the greater number of social activities involving the consumption of alcoholic beverages, thus increasing the probability of collisions[7,8].

Factors as population and car fleet growth, associated with recklessness and negligence regarding the current national traffic laws, are some examples of what leads the incidence and severity of facial traumas caused by traffic accidents to increase[6]. Recent data demonstrate that more than 69% of the accidents that took place on federal roads in 2014 were caused by the drivers' recklessness, e.g., speeding, riskily overpassing other vehicles, driving under the influence of alcohol, lack of attention, and others[9].

Victims are mostly adult males, ranging from 20 to 40 years old, with low schooling[1,3,7,8,10]. Such a prevalence in this age group can be attributed to the greater access young people have to motor vehicles and their driving at high speeds, as well as the traffic laws not being made known nor enforced enough[2]. Studies state that the most affected population attended only up to middle school and have low income[3,11]. Some authors[2,5] highlight that the male prevalence in getting involved in this type of accident can reflect their greater consumption of alcohol and other drugs, besides their representing the most economically active population in the country.

Facial lesions are considered a serious public health issue, both in developed and developing countries because they significantly require prolonged attention and treatment[7]. Traffic accidents also cause many other expenses with direct and indirect social and economic impacts on the federal public revenue[12]. The cost of health teams attending the victims, property loss caused in the occasion of the trauma, wage loss, and permanent or temporary disability often lead to difficulty in the social reinsertion of the victims, as well as their return to the labor force[4].

An issue that needs to be considered is that facial lesions can bring serious consequences to the victims, such as alterations in the chewing, swallowing and speech functions, which are predictive factors of impaired daily activities and quality of life[8]. It is important to highlight that the affections not only involve soft tissues and bones but can also involve, by extension, the brain, eyes, paranasal sinuses, and dentition[9]. Among the damage caused in the patients who survive motorcycle accidents, for example, there are motor and psychological sequelae, and mutilations[8].

Facial lesion diagnosis and treatment involve multidisciplinary attention[13]. In large urban areas and particularly at health services linked to academic institutions, the diagnosis and handling of these lesions are always mentioned and widespread among health professionals, as they aim to prevent late sequelae, oftentimes difficultly treated[14]. This treatment involves a multiprofessional health team both in the immediate assistance following the affection and in the care during the rehabilitation period.

Given the high prevalence of facial traumas resulting from traffic accidents and the importance of establishing educative and preventive measures, this study aimed at verifying the population's perspective on facial trauma, according to their background. The importance of such studies like this one is emphasized, as they give access to information on how the population understands facial trauma, thus, contributing to increased knowledge and fomenting the development of efficient public policies in this area.

METHODS

The research was approved by the Human Research Ethics Committee (HREC) of the *Universidade Federal de Pernambuco* - UFPE, under protocol number 2.131.348. The HREC did not require the Informed Consent Form.

This observational, cross-sectional, documentary, quantitative study was based on a survey on a structured questionnaire data bank, which compiles 951 interviews applied to passers-by of both genders. These interviews were part of a public campaign conducted in Recife, PE, and João Pessoa, PB, Brazil, to make the

general population aware of the causes and consequences of facial traumas, as well as the therapeutic possibilities for these victims.

The data collection initially consisted of the analysis of the items that composed the data bank of questionnaires applied, checking and selecting the sets of complete answers, which was the inclusion criterion. The content referring to 99 questionnaires was excluded. The criterion adopted was the absence of information on any item and/or question of the applied questionnaire. In total, 852 of them participated in the research.

The questionnaire comprised 15 single-answer, multiple-choice questions, named q1 to q15 (Figure 1). The questions referred to the subject's characterization data regarding gender (male or female), age (youth,

adult, or older adult), schooling (no study/incomplete middle school, complete middle school, high school, or higher education). The "no study" and "incomplete middle school" schooling levels were grouped together because of the small number of illiterate interviewees. In addition to these, there were questions related to what the interviewee understands about the general aspects of facial traumas (causes and consequences to functions and structures, most affected population, professionals who deal with them, duration of the sequelae, knowledge on what the trauma is, where they acquired information on the subject from, interest in knowing more about the subject, and what their opinion is about health education campaigns). These questions were considered in this study as dependent variables.

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q1: Age

q2: Gender

q3: Schooling

q4: Knowledge of facial trauma

q5: Consequences of facial trauma

q6: Most affected population

q7: Main causes of facial trauma

q8: Population more likely to suffer facial trauma in traffic

q9: Professionals that work in the treatment of people with facial trauma

q10: Duration of the consequences of facial trauma

q11: Consequences of facial trauma on the subject's life

q12: Causes of facial trauma in traffic

q13: Previous information on facial trauma

q14: Desire to broaden knowledge of facial trauma

q15: Importance of campaigns about facial trauma

Figure 1. Questionnaire applied to passers-by

Three age groups were defined: 10 to 19 years old (youth), 20-39 years old (young adults), 40-59 years old (adults), and 60 years old and over (older adults). The adult group was subdivided into two, as the first one is the risk group of greater vulnerability to facial traumas, according to what is described in the literature[4].

This study sought to verify the association between the independent variable "level of schooling" and the

answers given by the candidates in each question of the device (q5 to q15).

The data collected from the abovementioned data bank were descriptively analyzed through absolute and percentage frequencies for the categorical variables. To evaluate the association between two categorical variables, Pearson's chi-square test was used; when the condition to use the chi-square test was not verified,

Fisher's exact test was used. The margin of error used for the decisions in the statistical tests was 5%. The data were entered into an Excel spreadsheet, and the software used to obtain statistical calculations was the IBM SPSS, version 23.

RESULTS

The results referring to the characterization of the research's subjects are shown in Table 1. It stands out that most of the participants were female, aged from 20 to 39 years, having finished high school.

Table 1. Characterization of the interviewees regarding gender, age group and level of schooling

Variable	Population interviewed		P-value
	N	%	
Total	852	100.0	
Gender			p$^{(1)}$=0.001*
Males	394	46.2	
Females	458	53.8	
Age group (years)			p$^{(1)}$<0.001*
10 to 19	238	27.9	
20 to 39	351	41.2	
40 to 59	181	21.2	
60 or over	82	9.6	
Schooling			p$^{(1)}$<0.001*
No study/incomplete middle school	113	13.3	
Middle school	254	29.8	
High school	338	39.7	
Higher education	147	17.3	

Significant association at 5%; Chi-square test.

When evaluating the answers related to the population's perspective about facial traumas associated with levels of schooling, significant associations between the level of schooling and the variables studied were registered. Attention is called to the percentages of those who considered each of the problems "impairment of the functions" and "mouth/face mobility" as consequences of facial trauma (q5), which significantly increased along with the level of schooling (p = 0.001 and p = 0.005, respectively). In the variable "dental issues", the highest percentage corresponded to those who had higher education (p = 0.003).

In the question of who is more likely to suffer facial trauma (q6), the answer "youth" was more frequent among those who had higher education, followed by those who finished high school and ranged from 15.0% to 16.5% in the other two schooling categories (p = 0.001). The participants that answered that the "adults" were the main victims of trauma were in the group of people with a high school degree (31.1%), ranging from 22.0% to 23.1% in the other three categories (p = 0.044) (Table 2).

Regarding the main causes of facial trauma (q7), the higher education group was the one that presented the greatest percentage for the answer "traffic accidents" (81.6%), followed by those who finished high school and middle school (71.3%), with p = 0.034.

As for who is more likely to suffer facial trauma in traffic (q8), the percentage of those who answered "bikers" was higher among those who had higher education (40.8%), followed by the ones with finished high school (35.2%), and ranged from 27.2% to 27.4% in the other categories (p = 0.016). The percentage of those who answered "motorcyclists" increased together with the level of schooling, with 41.6% in the "no study/incomplete middle school" group, 55.1% in the "complete middle school", 65.1% in the "high school", and 71.4% in the "higher education" group (p<0.001) (Table 2).

Concerning the professionals that can be involved in treating people with facial trauma (q9), in all categories, the highest percentage occurred among those who had higher education, whereas the second-highest percentage was among those who finished high

school. For the "physiotherapists", "psychologists" and "nurses" option, the lowest percentage occurred among the "no study/incomplete middle school" group. The percentage of interviewees who answered "physicians" ranged from 56.3% to 78.4% (p = 0.002); as for the "physiotherapists" alternative, it ranged from 51.3% to 74.1% (p = 0.001); in the "psychologists" group, from 21.2% to 35.4% (p<0.04); in the "dentists" option, from 29.9% to 53.7% (p<0.001); in the "speech-language-hearing therapists", from 23.9% to 69.4% (p<0.001); and, in the "nurses", from 16.9% to 34.0% (p = 0.001) (Table 2).

Regarding the issue of facial trauma consequences on the subject's life (q11), as seen in Table 2, the highest percentage of answers stating that it impacted the "general health" was among those who had higher education (p = 0.049). The percentage of those who answered there were consequences on the "emotional" context also increased along with the level of schooling: 46.9% in the "no study/incomplete middle school" group, 52.4% in the "middle school" group, 63.6% in the "high school" group, and 73.5% in the "higher education" group (p<0.001). Those who mentioned "household chores" also belonged to the "higher education" group (p = 0.018). The same happened with those who stated there were impacts on "social and/or personal life", i.e., increased along with schooling (p<0.001).

Lastly, concerning the opinion about the causes of facial traumas in traffic, the percentage of those who answered "recklessness" also increased along with schooling, with the values 74.3%, 76.0%, 81.7%, and 89.1%, from "no study/incomplete middle school" to "higher education", respectively.

Table 2. Participants' understanding on general aspects of facial trauma in association with schooling

Variable	Schooling										P-value
	No study and incomplete middle school		Middle school		High school		Higher education		Total group		
	N	%	n	%	N	%	N	%	n	%	
Total	113	100.0	254	100.0	338	100.0	147	100.0	852	100.0	
q5											
Function	79	69.9	191	75.2	268	79.3	132	89.8	670	78.6	p(1)=0.001*
Mouth/face mobility	77	68.1	200	78.7	267	79.0	127	86.4	671	78.8	p(1)=0.005*
Dental issues	66	58.4	147	57.9	216	63.9	111	75.5	540	63.4	p(1)=0.003*
Pain/Sensibility	81	71.7	210	82.7	265	78.4	121	82.3	677	79.5	p(1)=0.080
q6											
Children	25	22.1	67	26.4	87	25.7	49	33.3	228	26.8	p(1)=0.197
Youth	17	15.0	42	16.5	84	24.9	47	32.0	190	22.3	p(1)=0.001*
Adults	25	22.1	56	22.0	105	31.1	34	23.1	220	25.8	p(1)=0.044*
Older adults	66	58.4	137	53.9	196	58.0	80	54.4	479	56.2	p(1)=0.710
q7											
Fight	30	26.5	66	26.0	87	25.7	53	36.1	236	27.7	p(1)=0.101
Domestic accident	16	14.2	43	16.9	76	22.5	37	25.2	172	20.2	p(1)=0.055
Practice of sports	21	18.6	38	15.0	62	18.3	33	22.4	154	18.1	p(1)=0.308
Fall	27	23.9	84	33.1	128	37.9	57	38.8	296	34.7	p(1)=0.034*
Traffic accident	75	66.4	181	71.3	241	71.3	120	81.6	617	72.4	p(1)=0.034*
q8											
Pedestrian	44	38.9	88	34.6	131	38.8	62	42.2	325	38.1	p(1)=0.491
Big vehicle driver	6	5.3	19	7.5	37	10.9	14	9.5	76	8.9	p(1)=0.237
Biker	31	27.4	69	27.2	119	35.2	60	40.8	279	32.7	p(1)=0.016*
Motorcyclist	47	41.6	140	55.1	220	65.1	105	71.4	512	60.1	p(1)=0.001*
Small vehicle driver	11	9.7	28	11.0	49	14.5	24	16.3	112	13.1	p(1)=0.262

Variable	Schooling										P-value
	No study and incomplete middle school		Middle school		High school		Higher education		Total group		
	N	%	n	%	N	%	N	%	n	%	
q9											
Physician	68	60.2	143	56.3	221	65.4	110	74.8	542	63.6	p[1]=0.002*
Physiotherapist	58	51.3	159	62.6	230	68.0	109	74.1	556	65.3	p[1]=0.001*
Psychologist	24	21.2	61	24.0	93	27.5	52	35.4	230	27.0	p[1]=0.040*
Dentist	34	30.1	76	29.9	142	42.0	79	53.7	331	38.8	p[1]=0.001*
Speech-language-hearing therapist	27	23.9	92	36.2	157	46.4	102	69.4	378	44.4	p[1]=0.001*
Nurse	24	21.2	43	16.9	79	23.4	50	34.0	196	23.0	p[1]=0.001*
q10											
No problems	2	1.8	3	1.2	0	0.0	2	1.4	7	0.8	p[1]=0.174
Days	3	2.7	14	5.5	15	4.4	14	9.5	46	5.4	p[2]=0.066
Months	33	29.2	71	28.0	95	28.1	44	29.9	243	28.5	p[2]=0.971
Years	78	69.0	181	71.3	249	73.7	108	73.5	616	72.3	p[2]=0.763
q11											
General health	60	53.1	117	46.1	189	55.9	86	58.5	452	53.1	p[2]=0.049*
Emotional	53	46.9	133	52.4	215	63.6	108	73.5	509	59.7	p[2]=0.001*
Household chores	29	25.7	46	18.1	60	17.8	42	28.6	177	20.8	p[2]=0.018*
Work	46	40.7	107	42.1	159	47.0	75	51.0	387	45.4	p[2]=0.227
Social and/or personal life	43	38.1	119	46.9	184	54.4	102	69.4	448	52.6	p[2]=0.001*
q12											
Lack of traffic signs	21	18.6	48	18.9	59	17.5	27	18.4	155	18.2	p[1]=0.974
Lack of safety equipment	48	42.5	108	42.5	164	48.5	81	55.1	401	47.1	p[1]=0.067
Lack of instruction	26	23.0	45	17.7	55	16.3	23	15.6	149	17.5	p[1]=0.378
Recklessness	84	74.3	193	76.0	276	81.7	131	89.1	684	80.3	p[1]=0.004*

q5: Consequences of facial trauma; q6: Most affected population; q7: Main causes of facial trauma; q8: Population more likely to suffer facial trauma in traffic; q9: Professionals that work in the treatment of people with facial trauma; q10: Duration of the consequences of facial trauma; q11: Consequences of facial trauma on the subject's life; q12: Causes of facial trauma in traffic; *Significant association at 5%; [1]Chi-square test; [2]Fisher's exact test.

Regarding question q13, as seen in Table 3, the percentage that answered positively about having previously acquired information on facial trauma increased along with the level of schooling (p = 0.004). The percentage of those who mentioned "newspapers/magazines" was zero among those who had not completed middle school and ranged from 30.0% to 39.4% in the other three categories (p = 0.023). Among those who said that the source of information was "health professionals", the highest percentage was in the group of those who had higher education (38.5%), the lowest in the "middle school" group (10.0%) and it ranged from 20.0% to 23.1% in the other two schooling categories considered (p = 0.005). Concerning the question of previous knowledge about facial trauma (q4), the percentages of those who answered positively increased along with the level of schooling.

Table 3. Interviewees' knowledge about and interest in information regarding facial trauma

Variable	Schooling										P-value
	No study/ incomplete middle school		Middle school		High school		Higher education		Total group		
	n	%	n	%	N	%	N	%	n	%	
Total	113	100.0	254	100.0	338	100.0	147	100.0	852	100.0	
q13											
Yes	15	13.3	50	19.7	104	30.8	65	44.2	234	27.5	0.001*
Newspapers/Magazines	0	0.0	15	30.0	41	39.4	21	32.3	77	32.9	0.023*
Internet/Social Media	3	20.0	16	32.0	28	26.9	16	24.6	63	26.9	0.754
Friends/Relatives	6	40.0	18	36.0	39	37.5	13	20.0	76	32.5	0.090
Television	6	40.0	19	38.0	44	42.3	18	27.7	87	37.2	0.291
Health Professionals	3	20.0	5	10.0	24	23.1	25	38.5	57	24.4	0.005*
q4											0.001*
No	88	77.9	183	72.0	201	59.5	60	40.8	532	62.4	
Yes	25	22.1	71	28.0	137	40.5	87	59.2	320	37.6	
q14											0.538
No	16	14.2	21	8.3	42	12.4	19	12.9	98	11.5	
Yes	86	76.1	205	80.7	265	78.4	117	79.6	673	79.0	
I do not know	11	9.7	28	11.0	31	9.2	11	7.5	81	9.5	
q15											0.287
No	2	1.8	3	1.2	9	2.7	2	1.4	16	1.9	
Yes	111	98.2	250	98.4	326	96.4	141	95.9	828	97.2	
I do not know	0	0.0	1	0.4	3	0.9	4	2.7	8	0.9	

q13: Previous information on facial trauma; q4: Knowledge of facial trauma; q14: Desire to broaden knowledge of facial trauma; q15: Importance of campaigns about facial trauma; *Significant association at 5%; (1)Chi-square test; (2)Fisher's exact test.

DISCUSSION

In this study, it was noted that the population with lower levels of schooling presented less knowledge about the general aspects related to facial trauma, such as the consequences of trauma, the most affected population, main causes, and others. This raised concern because in the literature it is described that the frequency of involvement in traffic accidents by the level of schooling is higher among people who have completed middle school and have not completed high school[15-17]. Hence, it is verified that in the population studied the group most affected by facial trauma does not have a solid knowledge of the subject. This calls attention to the need for investments in health education, accident prevention through traffic education, and the development of protocols to attend victims of traumatism[18].

Concerning the population's understanding on the causes of facial trauma in traffic accidents, it is highlighted that the highest percentage marking "recklessness" was in the "higher education" group. Such a result is in line with a study[16], in which people

with this academic level presented higher percentages of use of safety equipment in automobiles and motorcycles. This indicates that the increase in the citizen's level of schooling is proportional to the increase in their understanding on causes of trauma in traffic and the need to use safety equipment.

In this study, the answer referring to the motorcyclist being the public more likely to suffer facial trauma increased along with schooling. Studies indicate that the motorcyclists are indeed the most lesioned ones in traffic accidents, especially due to their greater exposure and vulnerability[8]. Some authors[11] also state that facial traumas caused by motorcycle accidents are highly incident, predominantly among low-schooling, low-income men. Another study[17], which also observed academic levels, highlights that there is an identification of a low level of schooling with a greater risk factor for motorcycle traffic accidents.

The findings demonstrate that the population with a lower level of schooling does not identify alterations in the stomatognathic functions as a possible consequence of facial trauma. This is an alarming fact since

it is known that when patients affected by facial trauma are diagnosed there is a high percentage of complaints, such as difficulty to eat and pronounce words[19]. It is pointed out that alterations in orofacial functions can be minimized with speech-language-hearing treatment specific to facial lesions, eliminating the main complaints, diminishing the clinical signs observed and sequelae inherent to traumas, thus promoting myofunctional rehabilitation or functional adaptation[20].

Some authors state that the speech-language-hearing therapist contributes to making the adequate functioning of the stomatognathic system possible[21,22]. Thus, they are utterly important professionals in the rehabilitation team, as well as in working in initiatives preventing this type of accident. In this investigation, it was verified that only the interviewees with higher levels of schooling identified the speech-language-hearing therapist as a participating member of teams assisting victims of facial trauma.

The fact that the percentages of participants answering positively increased along with their levels of schooling reinforces the important need for investments on health education and prevention actions regarding facial trauma in the less schooled population, as they are the vulnerable ones to this type of accident.

The indication of there being gaps in their understanding on general aspects of facial traumas is perceived by the percentage of interviewees that stated the desire to broaden their knowledge of the subject. Thus, it is noted that the seriousness and complexity of facial trauma require not only the interdisciplinary cooperation in caring for these patients but also constant educative measures for the population regarding the preventive strategies, which is the cheapest way of directly and indirectly reducing the costs of sequelae brought about by the trauma[22]. Preventive measures have significantly lower economic and social costs than bearing the necessary expenses to unrestrictedly ensure health[12].

Studies point out that low schooling and lack of information can make it difficult for the population to understand the essential care to be taken in promoting health, preventing diseases and their complications, besides influencing the abilities of self-care behavior. Therefore, they hinder the prevention and early diagnosis, which increases the propensity to other complications[23-25].

Health education programs are extremely important to give greater visibility to the prevention of facial trauma. Organizing the education of people about health is based on coming closer to them in the community spaces, favoring local social movements, through dialog with the previous knowledge of users of health services and critical analysis of the reality[26].

Health education can be considered an instrument to promote and stimulate self-care, becoming the basis for health promotion policies. This includes methods to assess knowledge coming from the educative process, to detect possible flaws, to develop strategies for the situation to be reverted and the information absorbed by the population[27].

Creating public policies of health education fomented by the sociodemographic characteristics of the most vulnerable public is important, given the need to decrease the incidence of traffic accidents and their consequences, including facial trauma.

This study is limited by the unbalance in the number of participants, their levels of schooling and in the sociodemographic profile of both cities, which made it impossible to compare them. It is also recognized that, given the complexity of the subject and the possible influence of other factors in the interviewees' understanding, additional variables other than schooling should be investigated. In this sense, it is suggested that aspects related to income and gender, for instance, be observed in future studies.

CONCLUSION

After investigating this study's population's perspective on facial trauma, it was concluded that the interviewees' schooling was related to their understanding on the consequences of trauma, most affected population, main causes, professionals involved in treating victims of facial trauma, consequences brought about by facial trauma on people's lives, and previous knowledge of the subject.

Identifying motorcyclists as the main victims of facial trauma, as well as recklessness as one of the causes of traffic accidents, recognizing the impacts on the functions and mobility as consequences of facial trauma, and understanding the impacts on the general health, emotional aspects and social/personal life of the victims of facial trauma increased along with their levels of schooling.

The information found in this research contributes to developing campaigns, social initiatives and public policies intended for the most vulnerable population, so as to make citizens aware of the importance of facial trauma prevention.

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