

I did NOT feel like this at all before the accident: do men and women report different health and life consequences of a road traffic injury?

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ABSTRACT

Background Worldwide, injuries represent one of the leading causes of mortality, and nearly one-quarter of all injuries are road traffic related. In many high-income countries, the burden of road traffic injuries (RTIs) has shifted from premature death to injury and disability with long-term consequences; therefore, it is important to assess the full burden of an RTI on individual lives.

Objective To describe how men and women with minor and moderate injuries reported the consequences of an RTI on their health and lives.

Methods The study was designed as an explorative qualitative study, in which the answers to an open-ended question concerning the life and health consequences following injury were analysed using systematic text condensation.

Participants A total of 692 respondents with a minor or a moderate injury were included.

Results The respondents reported the consequences of the crash on their health and lives according to four categories: physical consequences, psychological consequences, everyday life consequences and financial consequences. The results show that medically classified minor and moderate injuries have detrimental long-term health and life consequences. Although men and women report some similar consequences, there are substantial differences in their reported psychological and everyday life consequences following an injury. Women report travel anxiety and PTSD-like symptoms, being life altering for them compared with men, for whom these types of reports were missing.

Conclusion These differences emphasise the importance of considering gender-specific physical and psychological consequences following an RTI.

Historically, road traffic-related crashes and injuries have often been neglected as a public health concern as they have been seen as random, unpreventable events.¹ During the past few decades, injuries have been recognised as preventable, and researchers have started to approach injuries by using a public health approach.² The first step in approaching injuries as a public health concern is to determine the scope and the characteristics of the problem.³ Traditionally, the scope of injuries has been described as the number of mortalities due to injuries in a specific country or worldwide.¹ Worldwide, injuries represent one of the leading causes of mortality, and nearly one-quarter of all injuries are road traffic related. In many high-income countries

(based on gross domestic product), the burden of road traffic injuries (RTIs) has shifted from premature death to injury and disability with long-term consequences⁴; therefore, it is important to assess the full burden of an RTI on individual lives.⁵ The consequences of non-fatal injuries reach beyond the physical aspect of the injury and include both the physical aspect of the injury and the psychosocial consequences following the injury.⁶ In many countries, data on consequences of injuries are obtained from police records, hospital medical records or databases from healthcare institutions. This type of data is essentially linked to the estimation of the seriousness of the injury, but the impact of the injury on individual lives is not captured.⁷ Although studies have shown that quality of life (QoL) decreases with injury severity,^{8,9} there are also contradictory results indicating that QoL is independent of injury severity or number of injuries and that both the physical and psychological domains of QoL are more affected for those with less severe injuries. Minor injuries have an impact on pain ratings, psychological reactions such as post-traumatic stress disorder and QoL aspects such as return to work following an injury.^{10–12} Research that has assessed the risk for permanent medical impairment has concluded that most medical impairments have been sustained from minor and moderate injuries.¹³ Considering that the less severe injuries are so frequent, their impact on public health is extensive. For example, a Swedish study¹³ found that a total of 65% of their study population (n=20484) suffered a minor injury that led to a permanent medical impairment. Moreover, there is evidence that women report in general poorer QoL, and the mental health domains are more affected for women than for their male counterparts.⁶ Considering the impact that minor injuries have on public health outcomes and the contradictory findings from previous studies, a better understanding of the complexity and the characteristics of the problem is needed. To obtain a deeper understanding of the consequences of an RTI, we conducted a study that aimed to describe how men and women with minor and moderate injuries reported the consequences of an RTI on their health and lives.

METHOD

In this study, the answers to the following open-ended question were qualitatively analysed: 'Please describe how your road traffic injury has affected



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your life, your health, etc'. This open-ended question was included in a questionnaire that was sent in November 2010 to persons identified in the Swedish Traffic Accident Data Acquisition System (STRADA) between 1 January 2007 and 31 December 2009 (n=4761). STRADA, a national registry of road traffic crashes, includes police-reported injuries and injury data from emergency care hospitals.¹⁴ The study population in the current study includes only those with minor and moderate injuries assessed according to the MAIS. The MAIS¹⁵ addresses multiple injuries and is based on the AIS,¹⁶ where the AIS score represents the threat to life associated with a single injury. Minor injuries are defined as injuries assessed as MAIS 1 and moderate injuries are defined as MAIS 2 according to the MAIS. For example, the minor injuries include diagnoses such as spinal strain, contusion to both upper and lower extremities, and minor lacerations.

Moreover, a lower age limit of 15 was set as inclusion criteria for participants to this study, as this age was the cut-off for informed consent from the guardian in the original study. Hence, the population included those who were over the age of 15 and who had answered the open-ended question.

Data analysis

The written answers for the open-ended question were imported to Open Code V4.03.¹⁷ Four of the authors (JB, MK, MH and RR) read and analysed the data using systematic text condensation inspired by Malterud.¹⁸ Systematic text condensation is a strategy for the analysis of qualitative data which 'aims for thematic analysis of meaning and content of data across cases'.¹⁸ This study included one open-ended question, which yielded a total of 692 answers; therefore, systematic text condensation was considered to be a suitable method that enabled the researcher a process of reflexivity while maintaining a level of methodological rigour. The analysis was conducted in the following steps: (1) to gain an understanding of the data, the authors read the answers multiple times with the aim of the study in mind; (2) preliminary categories were formed; (3) answers were encoded with codes derived from the data; (4) coded answers were read through until a consensus was reached; and (5) content within the coded groups were formed into descriptions and

categories that described the reports of the consequences of a road traffic crash. All authors participated in the subsequent elaboration of the categories. The preliminary categories (step 2) remained as final categories.

Each file (individual answer) in Open Code was identifiable via a unique number representing each respondent, his or her age and gender. This allowed the researchers to analyse the material further after the initial qualitative analysis in relation to age, gender and road user type.

RESULTS

A total of 692 respondents (286 males, 406 females) with a minor or a moderate injury were included in this study. Table 1 provides the demographic and injury details. On average, the respondents answered the survey 22 months after their RTI. The analysis resulted in four categories of descriptions of how participants who had been involved in an RTI reported the consequences of the crash on their health and lives: physical consequences, psychological consequences, everyday life consequences and financial consequences. When the material was analysed with regard to age, the results did not indicate differences in the reported consequences per se, rather the consequences reported seemed especially life altering for the younger participants. Moreover, there were no differences on the reported consequences divided by road user type (driver's vs passengers), but differences between the reported consequences between men and women were distinguished. Hence, the results are based on the reported differences between men and women, and the categories are presented with descriptions and quotations. See online supplementary material for additional quotes.

Physical consequences

Both men and women reported various physical problems related to the RTI, but there were differences between the types of physical consequences reported by gender. Both men and women described muscular and skeletal injuries; various pains in their feet, legs, neck, back and shoulders; feelings of numbness and stiffness; damage to the teeth and eyes; and incontinence. In addition to these physical problems, women reported

Table 1 Demographics and injury characteristics of participants

Variable	Category	Women, N=406		Men, N=286		Total, N=692	
		n	%	n	%	n	%
Demographics							
Age groups	16–24	74	18	48	126	126	18
	25–39	91	22	75	117	117	17
	40–65	177	44	131	99	99	14
	>65	64	16	32	11	117	17
Injury related							
Injury severity	Minor	186	46	110	38	296	43
	Moderate	220	54	176	62	396	57
Type of road user							
	Pedestrian	95	23	28	10	123	18
	Bicyclist	94	23	95	33	189	27
	Motorbike/moped	14	4	37	13	51	7
	Car occupant	191	47	125	44	316	46
	Other	12	3	1	0.3	13	2
Car occupant position	Drivers	124	65	100	80	224	71
	Passenger	67	35	25	20	92	29
Survey time (year)	Mean (SD)	1.84	0.772	1.91	0.793	1.87	0.781

a reduced ability to move, nasal obstruction, tinnitus and hearing deficiencies. Women also reported physiological stress reactions such as physical collapse, increased blood pressure, fatigue and dizziness, reactions that were absent among men. However, men mentioned physical consequences relating to intimacy, a consequence that women did not report. Time wise, the physical consequences lasted between a few hours or days, to descriptions of chronic conditions. Although men reported both short-term and long-term physical consequences, they also reported that their health was good despite the physical consequences previously mentioned, something that only a few women reported:

The traffic accident has affected me a lot. I have trouble with my spinal cord; sometimes it is hard for me to move. It feels like someone is pushing on my spine. Otherwise, my health is good, besides my back. Since the traffic accident, I've had trouble with my back, even now. I need help with this problem. Sometimes I have pain; sometimes I have no trouble. My health is good otherwise, except for my back. (Man, age 19, 3120)

I've got pain in my neck and it limits my mobility and the pain makes me tired. I also have a lump in my chest after the bruising from the seatbelt, which probably won't go away, because there is necrosis in the tissue. (Woman, age 67, 1180)

Psychological consequences

Both men and women described psychological consequences including depression, anxiety, and affective emotions (eg, anger) and loss of cognitive abilities (eg, memory problems and concentration difficulties). In general, men expressed the psychological consequences as psychological imbalance, worries and affective emotions, while women reported mainly travel anxiety and stress reactions. Travel anxieties were reported as anxiety when driving or being a passenger in a car. These anxiety symptoms included sweating and inability to relax in a car, insecurities in traffic when biking or driving, distrust towards other drivers and the need for control. Only a few men reported travel anxiety, and their descriptions differed from those reported by the women. Unlike the women's internally oriented anxiety, men's travel anxieties were externally oriented (eg, not trusting the maintenance of the roads or anxiety associated with weather conditions).

The more general stress reactions described by the women included symptoms of being hyper aroused and feelings of being mentally exhausted. Women also reported PTSD-like symptoms such as re-experiencing the trauma in the form of flashbacks, experiencing catastrophising, fear of dying, nightmares and symptoms of depression, descriptions that were lacking from the men. The few men who did describe any kind of PTSD-like symptoms ($n=3$) also reported that someone close to them was severely injured or died in the road traffic crash. However, men's descriptions were not as detailed or specific as the women's descriptions.

Both men and women reported that the RTI ruined their lives and highlighted the poor treatment and negligence by authorities and the healthcare system. Women expressed that this negligence had contributed to their negative psychological experiences. Although a majority of the respondents reported the RTI as being something negative and distressing, a small number of respondents, mainly men, reported the RTI as something that had made them more thankful and appreciative of life. Men also mentioned that they gained a deeper understanding of what mattered in life. Respondents described the above reactions, both as short-term and long-term psychological consequences of the RTI:

It destroyed my lust for life. The reason is that I had the most pain while sitting or lying down. Then come the thoughts: what happened to me; maybe I'll become disabled, paralyzed, and so on. (Man, age 41, 1539)

I have no physical discomfort after the traffic accident. However, psychologically, I easily become stressed in traffic, both when I'm driving and when I'm a passenger. Worst is when I'm sitting as a passenger. I feel stress, anxiety, and I get tense in certain situations. I look in the rear-view mirror and side mirrors extremely often, in fear that another car will 'rumble' into my car. I did NOT feel like this at all before the accident. (Woman, age 39, 1237)

Everyday life consequences

The everyday life consequences of the RTI were described in terms of physical and psychological restrictions of everyday life. Both men and women described chronic pain that limited their ability to participate in work/school, social activities and hobbies such as sports and gardening. In relation to work/school and hobbies, these limitations were often related to pain or discomfort, for example, difficulties working in certain positions due to pain. Although both older and younger participants mentioned limitations with working and the ability to participate in hobbies, these limitations were described as especially life altering for the younger respondents, as they were forced to quit their university education or make changes to their planned careers or the occupation that they just finished getting an education for or trained for due to the consequences of the injury. Moreover, the younger respondents described how their social lives were affected, as they were unable to participate in activities with their peers, which had a negative impact on their lives:

It has affected me a lot. At first, at school I couldn't do what I was supposed to because of the pain in my back. I couldn't continue driving a motorbike as I have done for several years. And after the injury, I couldn't/can't do my work 100%. (Woman, age 20, 1961)

For all the respondents, the social limitations were, in contrast to the work activities, most often hindered by psychological reactions such as not being able to cope with stress, being edgy, easily irritated, depressed and not being able to maintain a good spirit. Women reported limitations to their everyday lives due to anxiety or fear, fatigue and sleep deprivation. The physical restrictions made the women feel isolated at home and interfered with their ability to live a normal life.

Both men and women reported becoming more safety conscious after their RTI. This was expressed in terms of becoming more aware of traffic in general and in specific situations such as intersections, where women described trying to get eye contact with other drivers or keeping a safe distance from other cars. Some respondents reported that they started wearing a bicycle helmet after the RTI. Moreover, women reported reduced mobility after the RTI. They reported being hesitant to drive a car or to ride a bike, with some reporting that they had stopped driving after the RTI. Some women even reported moving to a new location closer to their work and shops since they did not want to commute in traffic after the RTI. The reduced mobility was most often connected to the fear and anxiety experienced while being in the same type of traffic situation as when the RTI occurred. The consequences of this fear were reported as much more severe for the women, as they experienced a reduced mobility, which was almost completely absent for the men. Unlike the women, the men did not report any adjustments to their lives due to fear or anxiety.

Both men and women reported feelings of powerlessness in relation to their contact with healthcare after the RTI. They

expressed that they did not get any help from doctors or health-care in general. Some respondents described that they found it difficult to get sympathy and understanding from other people, as their injuries were not physically visible.

I have trouble with carrying for *example* the children for a long duration of time. I can't perform work in front of my body, such as working at a workbench/sink for longer than a couple of minutes before it starts to hurt. Shovelling snow is difficult. Driving a car further than 1.5 km causes pain. (Man, age 38, 3117)

I'm afraid to drive or travel by car. Two years after the accident, I still avoid driving a car if I don't have to. I'm also careful in traffic as a pedestrian. I'm afraid of death, that I or someone in my family, or my friends will die in traffic. Burdensome to still worry; limits my life. (Woman, age 27, 1433)

Financial consequences

The financial consequences reported included unemployment, having to rely on sickness benefits and feelings of hopelessness due to the financial situation after the crash. Unemployment following the RTI was reported in most cases, in relation to the physical consequences of the crash. The physical consequences forced the respondents to quit their jobs or to close their businesses as the jobs were physically too straining to maintain after the RTI. Some respondents reported that it was very difficult for them to find a new job after the RTI due to their restricted physical abilities and that they were now forced to take on jobs that they did not like. Moreover, women reported having to rely on sickness benefits since they were not able to return to work after the injury. Some women reported that since they were employed on an hourly basis at the time of the RTI, they were declined unemployment insurance compensation.

Although both men and women reported feelings of powerlessness, they expressed these feelings in different ways. Both genders reported that they had not received any financial compensation after their injury from their insurance, but women also reported that they had no one who helped them with the compensation claim. Some women had to rely on their savings since they were not compensated or the compensation claim had not yet been processed. Women also reported increased insurance costs due to the RTI. Men, on the other hand, mentioned that they had been compensated for the injury but that they were not happy with the compensation and thought it was too low. Men also reported financial loss in relation to the damages to their car and that they had to buy a new one, which was not covered by the insurance. Finally, both men and women reported that they also had to compensate a third party for damages in relation to the RTI, which was a heavy financial burden on them.

In the beginning I worked half-time at my company. After some time the Social Insurance Agency withdrew my compensation. I did not receive unemployment benefits until I closed my company: no compensation for six months. After that I tried shorter jobs; right now, I'm unemployed. It has turned into a significant economic loss for me. (Man, age 53, 1092)

When I was in the car accident, I was working in home care, and the accident happened during working hours. After the accident, I was on sick leave due to neck and back pain. Because I was employed by the hour, I only received compensation for the days I was scheduled to work, which was only two weeks ahead. I tried to resume work and got some more hours, but I couldn't work fully with, for example, cleaning and heavy lifting. This soon led to me not being scheduled for more hours and becoming unemployed. I went to the Employment Service, but since I had studied before that job and the work had only lasted about three months, I wasn't eligible for unemployment benefits. All I could do was try to find a

job while living on my savings. Finding a job that wasn't strenuous for my back was almost impossible. (Woman, age 31, 1355)

DISCUSSION

A deeper understanding of the complexity of the consequences of RTI is needed to better address the care and rehabilitation needs of those who survive an RTI. The findings show that medically classified minor and moderate injuries have detrimental long-term health and life consequences, as described by the respondents. Although men and women reported similar consequences of an injury, there are also differences that need to be addressed, both in research and in clinical evaluations of injuries. Although both men and women report everyday life consequences of the injury such as impact on their work/school and social lives (especially debilitating for the younger respondents), the major differences in the reported consequences between the men and women were in relation to the psychological consequences. Although both men and women reported psychological consequences of the crash, the reports differed. Women reported more detrimental problems relating to the psychological consequences of the injury. These psychological consequences were debilitating for their everyday lives with travel anxiety causing reduced mobility for the women. Unlike the men, women reported PTSD-like symptoms. Although men reported different degrees of depression, similar to women, men did not report flashbacks, experiencing catastrophising, fear of dying and nightmares. These results are in line with previous research, which have shown that women, especially passengers, are more likely to report travel anxiety and psychological problems.^{19 20} Contrary to these findings, a study from Serbia²¹ found that travel anxiety was more frequent in men and those with more severe injuries. A plausible explanation for these conflicting findings could be that the current study included only minor and moderate injuries (MAIS 1 and 2) and that there are additional factors, which may have an impact on the consequences following injury that have not been accounted for in this study. Other studies that have included only minor and moderate injuries have reported findings such as the impact of minor injuries on pain intensity and physical and mental well-being, also noted in this study, but not on travel anxiety.¹² Moreover, Mayou and Bryant¹⁹ found in their UK-based study that passengers were more likely to express phobic anxiety about travel particularly in relation to being a passenger, while pedestrians were more worried about crossing the road. Similarly, women in the current study reported travel anxiety in relation to traffic situations that were similar to the situation of the injury event that they experienced. Furthermore, previous results show that the majority of those who experienced travel anxiety 3 months after a crash expressed continuing problems 5 years postcrash.²² These PTSD-like symptoms and travel anxiety, especially in relation to an RTI, are most often not considered in research on RTIs⁶ nor are they measured by traditional QoL instruments such as EQ-5D²³ and SF36,²⁴ which are often used as an endpoint in RTI research.⁶ Although QoL measures address depressive symptoms, these psychological consequences are not fully captured. Sutherland *et al's*²⁵ findings suggest that although there are similarities between accident phobias (which include travel anxiety) and PTSD, they are different constructs, and accident phobias are not subclinical or subsyndromal of PTSD.

The current study explored the consequences of an RTI on health and life using an open-ended question. This method captured the unprompted responses to the question, which might differ from the descriptions of the consequences if another

data collection method (eg, in-depth interviews) would have been applied. The analyses of the open-ended question posed some limitations. First, some of the answers were very short, consisting of just a few words, making the interpretation of the text difficult. Second, there was no opportunity to ask for a more detailed or in-depth description of the answers, which prohibits elaboration and limits the possibility to explore the consequences in detail. On the other hand, this study includes 97% of participants with a MAIS 1 or 2 injury and who returned the QoL assessment in the original study that was conducted (n=746); therefore, almost all of the participants who returned the questionnaire with the QoL assessment in the original study answered the open-ended question.

To enhance the validity and to avoid lone researcher bias,²⁶ a triangulation of researchers was included; hence, several researchers individually read the open-ended question to identify categories. As three of the authors are experienced in the research area, sensitivity to the subject matter was ensured. The other researchers (JB and MK) have methodological expertise in qualitative analysis but no experience in RTI research. This lack of experience, however, can be seen as positive in that it may have deepened and improved both the clarity and the validity of the study as this allowed for theory triangulation. Moreover, the theory triangulation and the reflective discussions within the research team and the translated quotations from the open-ended question ensured credibility.

Despite the previously mentioned limitations of the study method, this study provides knowledge based on the self-reported descriptions of life and health consequences of minor and moderate RTI. To fully understand the road safety problem, fatality data are not enough.²⁷ The individual consequences and health loss following an RTI may not necessarily be in line with the medical classification of the injury. The results give a deeper understanding of how RTI affect people's health and daily lives; despite this, men and women report similarities of the experienced consequences of an injurious event; however, they also report different consequences, both considering the type and the severity. Considering these gender differences, it is important to get a deeper understanding of why the reports differ; do men and women communicate about their injuries in different ways? In a clinical setting, this may have a great impact on the identification of the patients' needs and worries.

From the reported consequences on the health and lives of the respondents in the current study, it is apparent that it is not possible to define the health and life consequences merely based on the medical classification of the physical injury.²⁸ Instead, a holistic approach is needed, and there is also a need to move from gender-sensitive measures to gender-specific measures that explore the unique health experiences of each gender following an RTI, since the consequences might differ, depending on the gender.

CONCLUSION

The results show that medically classified minor and moderate injuries have detrimental long-term health and life consequences. Although men and women report some similar consequences, there are substantial differences. These differences emphasise the importance of considering gender-specific physical and psychological consequences following an RTI since even minor and moderate injuries can make patients unable to return to work, attend social events and have implications on other everyday life activities.

What is already known on this subject

- ▶ Injuries represent one of the leading causes of mortality, and nearly one-quarter of all injuries are road traffic related.
- ▶ The consequences of non-fatal injuries reach beyond the physical aspect of the injury.
- ▶ Road traffic injuries have detrimental effects on the quality of life of those affected.

What this study adds

- ▶ Medically classified minor and moderate injuries have detrimental long-term health and life consequences.
- ▶ Men and women report some similar consequences on their lives after an injury, but there are also substantial differences in the reports.
- ▶ These differences emphasise the importance of considering gender-specific physical and psychological consequences following a road traffic injury.

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