TOUR BUS CRASHES FROM THE PERSPECTIVE OF TOUR GUIDES

Aytug ARSLAN, PhD, Associate Professor
(Corresponding Author)
Izmir Katip Celebi University,
Faculty of Tourism, Department of Tourist Guiding
Cigli, Izmir, 35620, Turkey
E-mail: aytug.arslan@ikcu.edu.tr
Phone: +90 (232) 329 35 35

Gulsah AKKUS, PhD, Associate Professor
Izmir Katip Celebi University,
Faculty of Tourism, Department of Tourism Management
Cigli, Izmir, 35620, Turkey
Phone: +90 (232) 329 35 35
E-mail: gulsah.akkus@ikcu.edu.tr

Abstract

Purpose – This study aims to understand the causes of tour bus crashes (TBCs) and related injuries, which are considered in the context of work-related accidents (WRAs).
Design/Methodology/Approach – Five categories were obtained under occupational safety and health (OSH) by adopting qualitative and quantitative methods. Content analyses were employed by MAXQDA, 2020 for both open-ended survey questions and focus group interviews.
Findings – TBCs and resulting injuries substantially result from i) negligence and unintentional faults of tour guides, ii) physical faults of drivers such as fatigue and insomnia, iii) physical conditions such as the environment and roads, iv) cost-orientation by travel agencies and intensive tour programs v) structural reasons such as night travels. A significant relationship was determined between the physical faults of drivers and intensive tour programs of travel agencies. Therefore, it was determined that unsafe conditions have a much higher impact than expected on TBCs.
Originality of the research – TBCs were studied in the context of OSH for the first time. The study unveils the reasons behind fatal and non-fatal injuries of the TBCs by focusing on unsafe behavior and unsafe conditions.
Keywords Occupational safety and health, tour bus crash, tour guide, unsafe behaviour, unsafe condition

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INTRODUCTION

Every year, an estimated 1.3 million people die in motor vehicle crashes and 50 million get injured all around the world. If the necessary measures are not taken, the deaths due to motor vehicle accidents are projected to rise to 5th place among causes of death by 2030 (WHO, 2012, 51). Although there is no data on the annual total number of tourists who died due to motor vehicle crashes, studies show the importance of this matter. As the number of tourists grows, the number of motor vehicle crashes due to mobility in the transport sector increases. This is highly possible in less developed countries that have weak infrastructure and road safety problems (Hargarten, 1994, 48; Rosselló & Saenz-de-Miera, 2011, 675). A study carried out by Erdoğan (2009) reveals that cities in Turkey with a relatively lower population and a smaller number of vehicles display a high motor vehicle crash rate in peak tourism season due to being a tourist attraction or being on the route towards tourism destinations.

Occupational safety and health comprise preventative approaches that aim to avoid unsafe behavior and/or unsafe work conditions of employees and to create a safe work environment (Sormaz et al., 2014, 63). It is necessary to detect causes of work-related accidents based on factors such as employee behavior and workplace conditions to create and apply preventative solutions (Altunkaynak, 2018, 102). Reasons for WRAs[1] are classified into two groups which are unsafe conditions and unsafe behavior (Choudhry & Fang, 2008). While the first group is related to physical and environmental factors that increase the possibility of WRAs, the second group comprises conscious or unconscious behavior that increases the possibility of having a WRA for individuals (Şahin & Erkal, 2010, 41). Esin (2007) states that reasons for unsafe behavior include distractions, unintentional faulty behavior due to lack of education and experience, cutting corners, breaking rules, and being affected by environmental factors. Rather than individual ones, organizational factors constitute the basis of severe and/or fatal accidents (IOSH, 2019).

This study deals with TBCs and injuries as WRAs in the scope of unsafe behaviour and unsafe condition from the viewpoint of tour guides. Research questions are i) "What are the causes of TBCs and resulting injuries?" ii) "Which plays a higher role: unsafe behavior of drivers and tour guides (TG) or unsafe work conditions such as physical and social environments in TBCs?" Data were collected in two stages utilizing quantitative and qualitative methods respectively. First, a survey was collected from 90 TGs with open and closed-ended questions. Then, four separate focus group (FG) interviews were conducted with 16 people. The obtained data were coded and analyzed with content analysis.

[1] *Abbreviations:* TBC, Tour Bus Crash; TG, Tour Guide; OSH, Occupational Safety and Health; UB, Unsafe behaviour; UC, Unsafe Condition; FG, Focus Group; S, Survey; WRA, Work-related Accidents; WRIH, Work-related ill Health; n, sample size; f, frequency; MSD, Musculoskeletal Disorders.

Previous studies assess motor vehicle crashes as tourist accidents, in other words, they address it from a customer perspective and use death statistics. This study contributes to tourism literature for being the first one to adopt the employee perspective in the sense of handling TBCs as WRAs. It brings a fresh perspective to literature as it views TBCs and resulting injuries under two categories as unsafe behavior and unsafe conditions. Moreover, it offers valuable insight to travel agency management and lawmakers on preventing motor vehicle crashes and resulting injuries.

1. LITERATURE REVIEW

1.1. Unsafe Behaviour and Unsafe Condition

Gordon et al. (1996) explained the change in the perspective on the causes of accidents in four phases. Accordingly, technological failures were seen as the cause of accidents in the first phase when technological developments were intense. In the second phase in the 1920s, the human factor in accidents was brought to the forefront and human error and unsafe behaviour became a common concept. At the third stage towards the end of the 1940s, the role of the environment in the unsafe behaviour of individuals gained importance. Finally, attention is drawn to the responsibility of management in occupational health and safety.

Abdelhamid & Everett (2000) define an unsafe condition as "a condition in which the physical layout of the workplace or work location, the status of tools, equipment, and/or material violate contemporary safety standards". In this research, unsafe conditions are considered in three headings: physical, social/organizational, and structural environment. An unsafe social/organizational environment includes unsafe conditions created by travel agencies, whereas an unsafe physical environment includes road and weather conditions, and tour buses. The structural environment represents the factors specific to the nature of the profession such as long-term traveling and night driving.

Li et al. (2018) define unsafe behaviour as "any behaviour that an employee engages in without regard to safety rules, standards, procedures, instructions, and specific criteria in the system". However, as Abdelhamid & Everett (2000) mention, unsafe acts may not be regardless of the working conditions. In this research, unsafe behaviours of the tour guides and the drivers are taken into consideration and categorized as negligence, unintentional fault, and carelessness. The unintentional fault is regarded beyond the employee's control and sub-categorized as physical (tiredness and sleeplessness), psychological (low self-confidence and stress), or inexperience (ignorance and lack of training).

The causes of work-related accidents are framed as unsafe practices and unsafe conditions above. However, this framework can be used not only in work-related accidents (WRA) but also in revealing the causes of work-related ill health (WRIH) (Akkus, 2021; Akkus et al., 2022). In this research, reasons for WRA, reasons for WRIH, and prevention of both are categorized as unsafe behaviour and unsafe conditions.

1.2. Bus Crashes and Injuries

Studies on bus crashes in the literature mostly focus on public transport, long-distance journeys, and school services (Af Wåhlberg, 2002; McGeehan et al., 2006; Yang, et al., 2009; Palacio et al., 2009; Strathman et al., 2010; Sam et al., 2018; Porcu et al., 2020; Han & Zhao, 2020). Although they are relatively few, some studies are measuring the effects of tourism on road crashes (Bellos et al., 2020; Castillo-Manzano et al., 2020).

A study by Albertsson & Falkmer (2005) showed that the risk of death or injury in car travel increases by seven to nine times compared to bus travel in the OECD countries. Nevertheless, deaths and injuries caused by bus crashes are not negligible (Feng et al., 2016). 1.5% of motor vehicle crashes resulting in injuries in 2014 in France involved buses (Brenac & Clabaux, 2005, 836). Furthermore, bus crashes are responsible for nearly 2% of all fatal crashes in Europe (Barabino et al., 2021). In Turkey, 1.6% out of 243.125 vehicles involved in crashes resulting in death and injuries were buses on highways in 2020. In 2020, 3918 buses were involved in crashes resulting in death and injuries, ten drivers died, and 314 passengers were injured (TurkStat, Road Traffic Accident Statistics, 2020). According to data from internet news, seven TBCs in 2021 resulted in death or injury. Six people died and 189 were injured in these crashes.

Goh et al. (2014) defined factors impacting the fault of drivers in bus crashes. According to the study, autumn and winter seasons, shorter day times, single-lane roads, vehicles parked at the sides of roads, and old buses increase the risk of fault by the driver. When observing factors related to drivers, it is seen that drivers with less than 2-year experience, who are older than 60, and who have prior crashes have a higher risk of being involved in a crash. Af Wåhlberg (2004) stated that more than half of bus injuries resulted from bus drivers rather than other drivers. These are mostly due to falls in the bus because of emergency brakes. Also, fast and negligent driving increases the risk of fatalities (Damsere-Derry et al., 2021, 4). Especially in developing countries, commercial bus companies force drivers to work intensive long hours due to economic reasons. This causes tired drivers to sit in bus driver seats (Zhang et al., 2016, 34).

Wilks (1999) indicates that driving under influence and excessive speeding is observed much less in motor vehicle crashes caused by international drivers compared to local drivers. A study by Wilks et al. (1999) assessed that the primary causes of motor vehicle crashes regarding tourists include fatigue, the vehicle that is used, road conditions, and lack of knowledge of driving rules and road signs. Lucidi et al. (2013) have emphasized that fatigue is generally disregarded as the cause of motor vehicle crashes as visual factors are more likely to be put on official records.

The number of studies on TBCs is very limited. Tour buses are quite different from other bus companies in terms of environment and road conditions (Tseng, 2012, 911). Natural beauties and historical attractions like ancient cities are generally far away from city centers. A part of these locations that are far from frequently used transport roads is reached through rough and narrow roads without or with little to no tarmac. Narrow mountain roads or roads sided by stockades are used to reach historical monasteries or highlands. Wen & Xue (2020) investigated the risks of mountainous highways and found out that if a driver is unfamiliar with the topography and route, s/he is much more likely to make mistakes, especially in bad weather conditions. Also, animals herded by farmers or wild animals can suddenly appear on roads. A study by Tseng (2012) in Taiwan with 2023 bus drivers queried the correlation between driver-oriented crashes with socio-demographic qualities, experience, and distance. According to the outcome, driver experience was a major factor. It was determined that drivers with six to 14-year experience are much less likely to have a driver-related crash compared to others. The interpretation of the researcher is that tour bus drivers need time to adjust to the environment and road conditions. Even if the driver is familiar with the road, and not driving on the mountainous land but on the busy urban route, the risk gets higher (Huting et al., 2016).

Over the last decades, many studies have been carried out to investigate bus safety through various topics. These studies are either descriptive or developed models such as risk assessment, frequency prediction, and severity prediction (Barabino et al., 2021). However, in this study risks involved in TBCs were identified from a different perspective. Firstly, since this research is more concerned with WRAs, the incidents are approached from TGs perspective. Secondly, our aim is not to predict future incidents but to understand the circumstances which cause crashes and injuries. Therefore, instead of building a statistical model, a framework was preferred. Thirdly, the goal of this study is to enlighten the occupational risks on tour buses and contribute to the well-being of TGs rather than discussing the establishment of safety on the roads in general. However, the contribution to the improvement of road safety might be one of the crucial outcomes.

The selected studies which were listed according to the unsafe behaviour and unsafe condition are shown in Table 1. As seen in the table, there are inclusive studies that researchers investigated some or all of the concepts in various contexts. Drivers' profiles, physical situations, driving or road experience, psychological situation, and any negligence or related improper driving behaviour as a whole have an impact on crashes. Road conditions such as mountainous, rural, or dense urban highways, harsh weather conditions, vehicle-related factors like type, year, and model, organizational factors such as working long hours, and structural issues about the sector such as seasonality have an impact on bus crashes to some extent. The point is that these are common factors between a tour bus and other bus crashes. However, the unique factor on tour buses is TG. S/he is the authority on the bus. S/he gives the directives and mostly decides where to stop, and when to start. The tour guide does not directly increase the possibility of bus crashes, however, s/he may play role in injuries from the OSH perspective by acting safely or unsafely. Therefore, another unsafe behaviour section consisting of tour guides should be added to the table in tourism-related studies when injuries are of consideration as a part of WRAs. Consequently, this study addresses this gap in the literature by including the perspectives of TGs. There is no other study in the literature to investigate TBCs and injuries as WRAs from the TGs' point of view.

Table 1: **Selected Studies on Unsafe Behaviours and Unsafe Conditions in Road Crashes**

	Zegeer et al., 1994	Wilks, 1999	Wilks et al., 1999	Chang & Yeh, 2005	Tseng, 2012	Lucidi et al., 2013	Goh et al., 2014	Huting et al., 2016	Zhang et al., 2016	Bellos et al., 2020	Castillo-Manzano et al., 2020	Wen & Xue, 2020	Barabino et al., 2021	Damsere-Derry et al., 2021
UB\Drivers		**X**	**X**	**X**		**X**	**X**		**X**			**X**	**X**	**X**
Unintentional fault			x			x	x		x			x	x	x
inexperience			x				x	x				x	x	x
physical			x			x	x	x	x			x	x	
psychological													x	
Negligence		x		x								x	x	x

	Zegeer et al., 1994	Wilks, 1999	Wilks et al., 1999	Chang & Yeh, 2005	Tseng, 2012	Lucidi et al., 2013	Goh et al., 2014	Huting et al., 2016	Zhang et al., 2016	Bellos et al., 2020	Castillo-Manzano et al., 2020	Wen & Xue, 2020	Barabino et al., 2021	Damsere-Derry et al., 2021
UC\Physical Environment	**X**		**X**	**X**	**X**		**X**	**X**		**X**		**X**	**X**	**X**
road, weather conditions	x		x		x		x	x	x	x		x	x	
vehicle	x		x	x			x	x	x				x	x
UC\Social-organizational				**X**									**X**	
the company				x									x	
UC\Structural										**X**	**X**		**X**	
seasonality										x	x		x	

2. METHODOLOGY

This research deals with TBCs from the perspective of TGs. This explanatory sequential study (Guetterman et al., 2015) employs quantitative and qualitative data, respectively. A qualitative approach is used "when there is a need to explore a phenomenon, to understand individuals' experiences, or to develop a theory" (Guetterman et al., 2015, 555). Four FG interviews were conducted in March 2021 after an online survey in January 2021.

2.1. Measures

The survey was adapted with interview questions from the previous research (Akkus, 2021; Akkus et al., 2022). In these studies, participants were asked about their WRA and WRIH experience in different departments of hotels. There are very detailed questions such as whether the employees had a work accident in the hotel, on which day, at what time, what kind of accident happened, whether it could be prevented, and whether the work they did during the accident was under the job description.

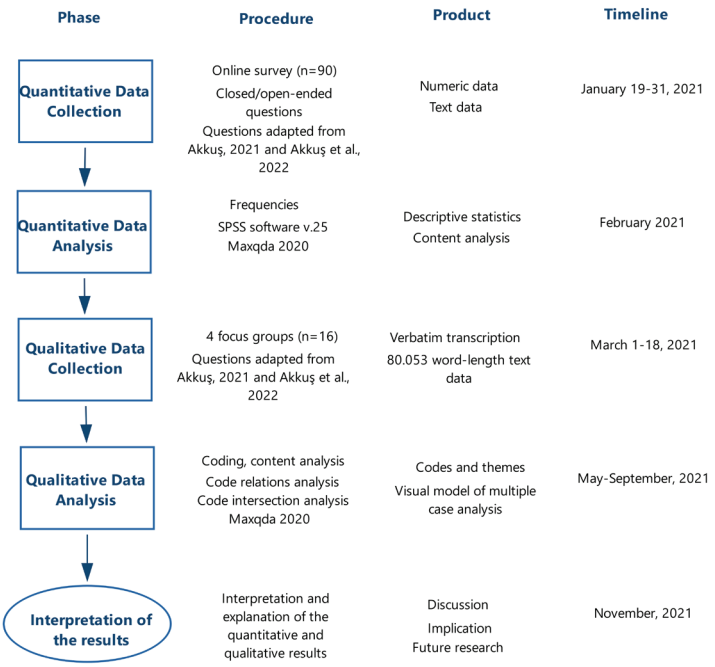
In this study, questions were related to WRAs and WRIH that tour guides had, and the prevention of these. The survey used both closed and open-ended questions. Semi-structured FG questions were derived from the survey through five topics: (i) reason of WRA, (ii) type of WRA, (iii) reason of WRIH, (iv) type of WRIH, and (v) prevention. The four questions that were addressed to the participants in the FGs and opened to the discussion are: i) "Have you ever had a work accident on tour?", "What kind of accident was it?", "What was the reason?", "Could it have been prevented?", "What kind of work accidents usually happen in the tour guiding profession?" ii) "Have you experienced any health problems due to your work?", "Under what circumstances/ reasons have you experienced/do you still experience these ailments?" iii) "What should be done differently to make your profession safer?", "How can it be made safer in terms of OSH?" iv) "Have you received OSH training?", "When and what kind of training it was?"

2.2. Data Collection and Analysis

After the preparation of the online survey, the chambers of tour guides across the country were contacted and informed about the questionnaire. 90 eligible questionnaires which were obtained from 19 January to 31 January 2021 were analyzed by using SPSS.

After getting an initial opinion about the topic, four FGs were conducted with four participants each. Purposeful sampling was used in this study to reach the participants with WRA or WRIH. The tour guides who participated in the survey were also reached via their phone numbers to be included in the research. Focus interviews were conducted online in the evening usually from 20:00 with the participation of both researchers. Each session lasted three hours on average and interviews were transcribed verbatim. Content analyses were employed by MAXQDA 2020 (VERBI Software, 2019) for both open-ended questions in the survey and FG interviews. Aligned with the questions, five categories were derived. The codebook was also adapted from previous research (Akkus, 2021; Akkus et al., 2022) and the final code list was shaped after analyzing the entire content. The stages of the research are presented as a flowchart in Figure 1.

Figure 1: **Phases of the study**



Resource: Adapted from Guetterman 2017

In content analysis, the findings can be organized in two ways: coded section-based and document-based. An expression is coded section-based if it is re-encoded whenever it appears in the text, and document-based if it is encoded once per participant. In this study, a middle way was preferred: In surveys, an expression is coded once, no matter how many times it appears in the answer to the same question; it is coded only once in what is said (a paragraph in the text) until someone else has told in the FG interviews.

The validity of the research was approached in several ways (Creswell & Plano Clark, 2018; Whittemore et al., 2001): i) First, the study adapted triangulation in sampling and data collection by utilizing both quantitative and qualitative approaches; ii) the participants by purposive sampling from different tour regions in Turkey were recruited; iii) the participant confirmation was reached by summarizing at the end of each FG session; iv) the interviews were transcribed verbatim; v) the participants' expressions were presented in figures with codes and themes; vi) MAXQDA 2020, which is a computer-based program, was utilized for data analysis.

2.3. Participants

Both survey and FG participants were active TGs from different regions in Turkey. There is a total of 12097 TGs in Turkey. The tour guides, two-thirds of whom are males, have professional chambers in some provinces. The numbers on the profile of the tour guides and their regional distribution are given in Table 2. 90 TGs participated in the online survey and 16 TGs joined in FG studies. Information about the participants is also given in the table. The fact that the majority of the tour guides surveyed were males is parallel with the existing structure of the tour guiding profession across the country. Female tour guides, on the other hand, were slightly more represented than men in FG studies. One reason was that females were much more willing to participate in the research. Another reason was that the study aimed to shed light on OSH problems that female tour guides experience.

The profession of tour guiding is practiced in two ways in Turkey national and regional. While regional tour guides do not work outside the regions specified on their work cards, there is no such limitation for national tour guides. Therefore, it can be expected that national tour guides will be more mobile due to the opportunity to work in a wider area. Table 2 displays the total number of tour guides in the country. However, there is no recorded demographic data about age and years of work experience.

In the regional distribution of TGs, the Marmara region, with the city of Istanbul as the main center of attraction, ranks first; it is followed by the Aegean, Mediterranean, and Central Anatolia regions respectively. It is seen that the regional distribution of the participants who are reached within the scope of the study is parallel with the regional distribution of the population of the research.

When the general profiles of the participants in terms of OHS are examined, nine of the survey participants had WRA, while

all of the FG participants had OSH issues. 54 of the survey participants and 13 of the FG participants had no OSH training.

Table 2: **Profile of TGs and participants**

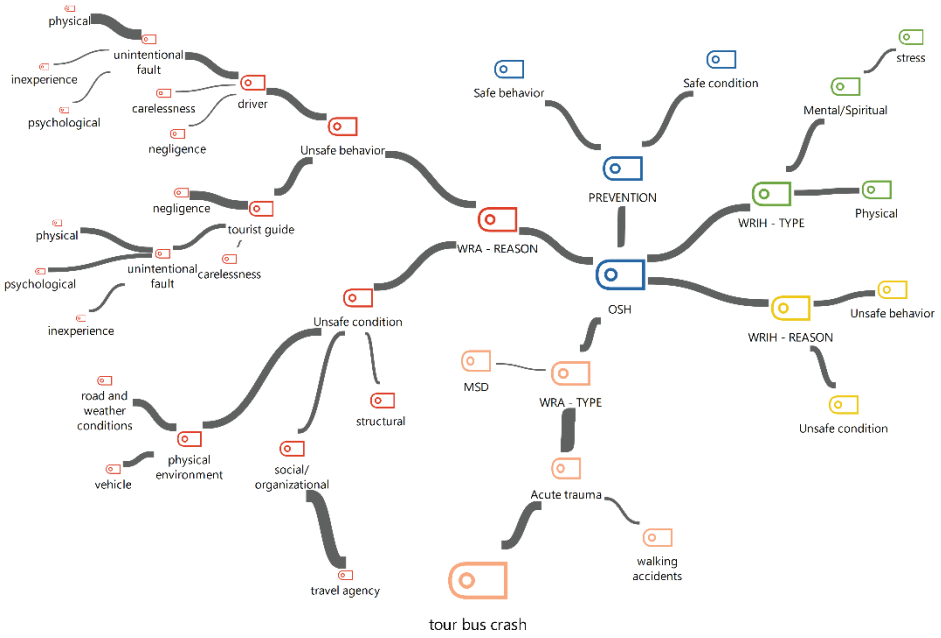
	Turkey (n=12097)	**Survey (n=90)**	**F.G. (n=16)**
Gender			
Female	4025 (33%)	16	9
Male	8072 (67%)	74	7
Age	**n/a**		
30 and below		10	1
31-40		47	8
41-50		16	4
51 and above		17	3
Experience (year)	**n/a**		
5 and below		16	1
6-10		15	6
11-15		31	4
16 and above		28	5
Regions			
Marmara	5477	52	6
Central Anatolia	1739	20	2
Aegean	2372	10	8
Mediterranean	1980	6	-
Black Sea	155	1	-
South/Eastern Anatolia	374	1	-
WRA	**n/a**		
Yes		9	16
No		81	-
OSH Education	**n/a**		
Yes		36	3
No		54	13

3. FINDINGS

3.1. Descriptive findings

As a result of the content analysis, five categories were obtained under the theme of OSH: (i) reason of WRA, (ii) type of WRA, (iii) reason of WRIH, (iv) type of WRIH, and (v) prevention. These categories and their sub-codes are shown in Figure 2. The thickness of the links in the figures shows the strength of the relationship, the stronger the relationship, the thicker the link is seen. The solid lines show codes/sub-codes, and the dashed lines show the relationship between the codes. The coloring was done to distinguish categories.

Figure 2: **Codebook related to TBCs**



The letter f in parentheses refers to the frequencies of the expressions encoded based on the coded section, and the percentages indicate the ratio of the code or subcode within the specified category. The values in Table 3 reflect a section drawn from the study results for a better comprehension of the subject. Frequencies and percentages refer to the mean value calculated from the survey and FG results.

Table 3: **Descriptive of WRA-Type**

	f	%
WRA-Type	**214**	**100**
Acute trauma	**199**	**93**
Tour bus crashes	116	54
Walking accidents	51	24
Others	32	15
MSD (sprains/strains)	**15**	**7**

When the WRA-Type category in the codebook is evaluated, it is understood that the most common WRAs that TGs had are acute trauma (93%) and musculoskeletal disorders (MSD) such as strains and sprains (7%). Acute trauma includes TBC and accidents such as falls, injuries, sunburns, and insect bites that occur during walking. TBC (54%) is the most common code in the WRA-Type category that more than half of the WRAs are due to bus crashes.

3.2. Inferential findings on TBC

Code relations and code intersection analyses were performed to reveal the WRAs related to TBC. Code relations analysis is visually used to detect whether there is a co-occurrence of codes at a glance (Maxqda, 2021). If there are codes in the same section, even if they are not in the same section but close to each other, or in the same document, there is an intersection in the code relations matrix. The bigger the number or square is at the intersection of the codes, the stronger the relationship is between the two codes. In this study, the intersections of the codes in the same section were examined. Code intersection analysis, on the other hand, allows for a more graphical presentation and understanding of the relationships among codes. The logic of both analyses is the same. However, while the first one uses a matrix, the second one has a network structure that allows complex relationships to be comprehended easily.

As a result of the analysis performed through the code relations browser after the codes related to TBCs were determined, it is understood that the causes of TBCs are mostly related to unsafe behavior (f=42, 56%) (Table 4). Mentioned here are the unsafe behavior of the TG (f=27, 36%) and the driver (f=15, 20%). Although the behavior of the TG does not affect the occurrence of the TBC, his/her unsafe behavior increases the risk of fatal and nonfatal injuries. Therefore, there is an important relationship between fatal or non-fatal injuries and the unsafe behavior of TGs in TBCs. TBCs are more severe due to the negligence of

the TG (f=17, 23%) such as standing narrative, sitting in a jump seat, and not using a safety belt. On the other hand, the unsafe behavior of the driver directly causes TBCs. Such crashes are mostly due to the drivers' unintentional faults (f=11, 14%) such as physical faults because of tiredness and fatigue, inexperience on roads, weather conditions, and psychological reasons. The other causes of TBCs from drivers are carelessness (3%) and negligence (3%) mainly due to speed and improper driving.

Table 4: **Code Relations of TBC**

	TBC	
	f	**%**
WRA-REASON	**75**	**100**
Unsafe Behaviour	**42**	**56**
UB\Tour guides	**27**	**36**
Carelessness	1	2
Negligence	17	23
Unintentional fault	8	11
physical	4	5
inexperience	1	2
psychological	3	4
UB\Drivers*	**15**	**20**
Carelessness	2	3
Negligence	2	3
Unintentional fault	11	14
physical	9	10
inexperience	1	2
psychological	1	2
Unsafe Condition*	**33**	**44**
Physical environment	16	21
road and weather conditions	6	8
vehicle	8	11
Social/organizational	12	16
travel agency	11	14
Structural	5	7
WRIH-TYPE	**13**	**100**
stress	9	69
PREVENTION*	**18**	**100**
Safe Behaviour	**6**	**33**
SB\Tour guides	5	28
SB\Drivers	1	5
Safe Condition	**12**	**67**
Social/organizational	12	67
travel agency	8	44
policymakers	3	17

*: Irrelevant or negligible codes were not included.

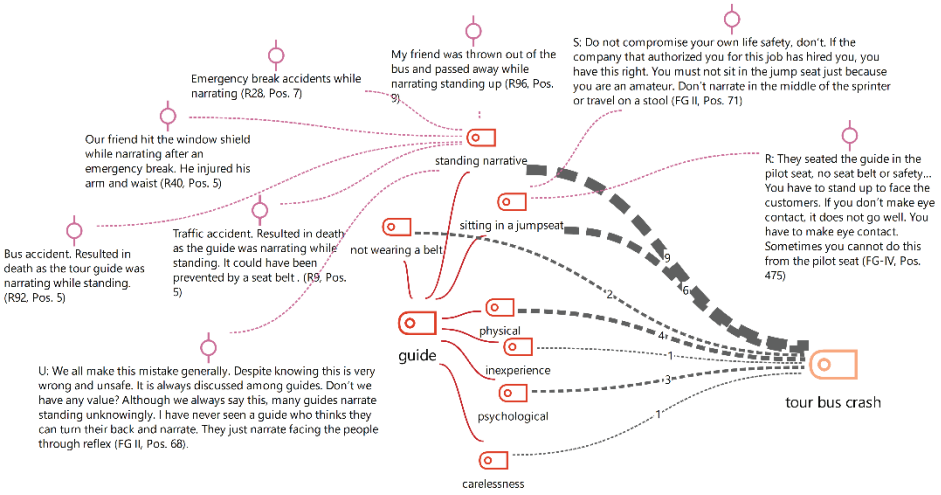
Unsafe conditions (f=33, 44%), which affect TBCs in the second place, mostly consist of the physical environment (f=16, 21%). The effect of the physical environment on WRA is due to road and weather conditions (8%) and vehicles (11%). Among the risks associated with the vehicle; the vehicle's lack of maintenance, old age, lack of protective equipment, and lack of belts are the most emphasized physical risk factors of TBC. Road and weather conditions are challenging climatic conditions such as excessive rainfall, storms, wind, hail, winter conditions, and terrain and road difficulties. Although the social/organizational environment (f=12, 16%) ranks in the second place, the subcode of the travel agency (14%) is the unsafe condition factor that causes the most TBC. Travel agencies' practices that increase the risk of crashes are usually busy tour schedules, over-working of drivers, and being cost-oriented. Another important risk factor that is effective in crashes is the structural conditions caused by the nature of the work. Daily or package tours that require continuous travel and night drives pave the way for bus crashes. It

is also understood that TBCs are also related to stress. Among WRIH types, stress is the main contributor to TBCs. Participants mostly mentioned stressful and busy tours before the TBCs.

In terms of preventing TBCs, the biggest emphasis was put on the safe condition (f=12, 67%). The travel agencies (44%) and policymakers (17%) should take necessary precautions. Travel agencies must regulate the working conditions of the tour guides by providing tour guide seats/rotating seats; letting drivers rest enough, having two drivers on the tours, removing night travel or keeping overnight travel short; not organizing intensive tour programs, and being quality-oriented. Besides, the maintenance and renewal of the tour buses should not be neglected. On the other hand, almost all of the behavioural suggestions for safety were about tour guides (f=5, 28%) in connection with their negligent behaviour (f=3, 17%).

To evaluate the relationship between the codes in Table 4 and TBCs in more detail, code intersection analyses were performed. It was determined that the TG's negligence such as standing narrative (f=9), sitting in a jump seat (f=6), not wearing a seat belt (f=2), unintentional faults (f=8) such as physical reasons due to fatigue and insomnia, inexperience, and psychological reasons stemmed from excessive stress may cause severe injury or death in the TBCs (Figure 3). TGs' expressions of their unsafe behaviour were also provided in the figure.

Figure 3: **Code Intersections between TGs and the TBCs**



The effect of unsafe behaviour of drivers in TBCs is mostly due to physical reasons (f=9), which can be expressed as unintentional faults. Under this code, there are only fatigue and insomnia sub-codes. Another reason leading to TBCs is the negligence (f=2) and carelessness (f=2) of the driver (Figure 4). TGs' expressions on drivers' unsafe behaviour were also provided in the figure.

Figure 4: **Code Intersections between Drivers and the TBCs**

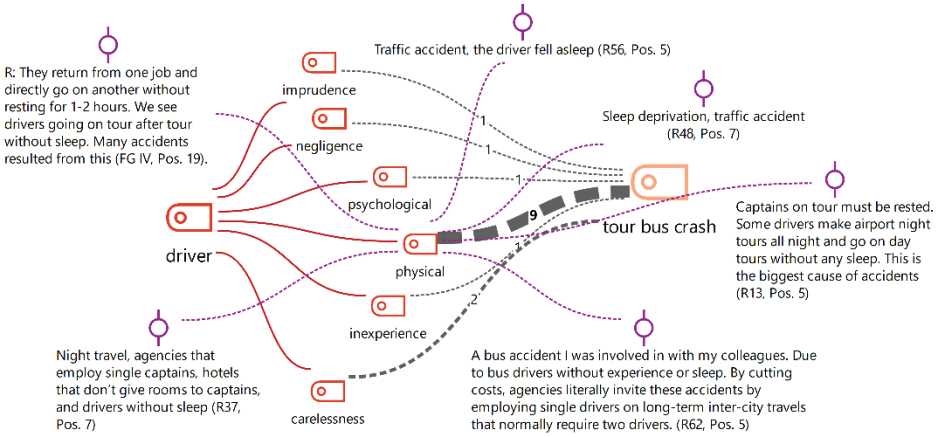
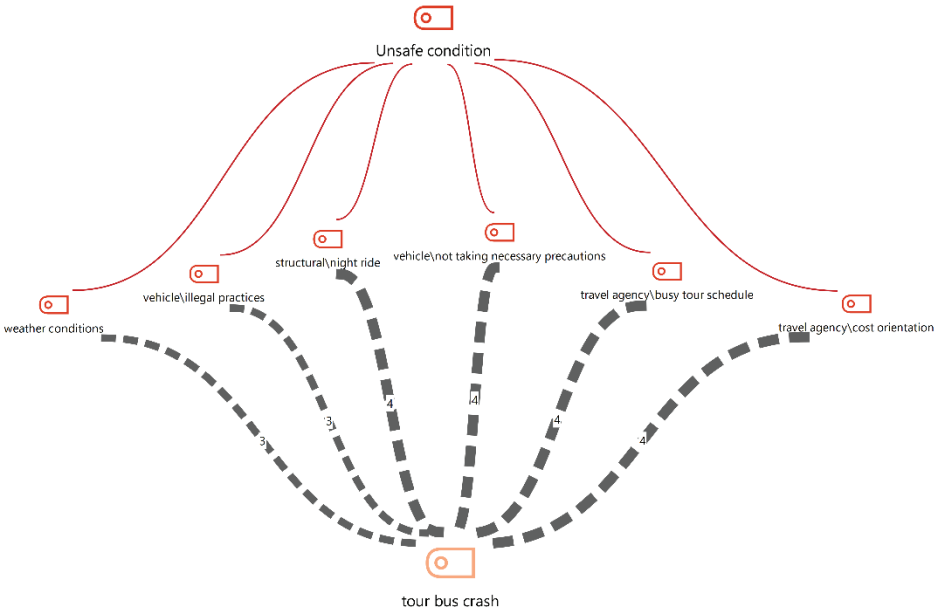


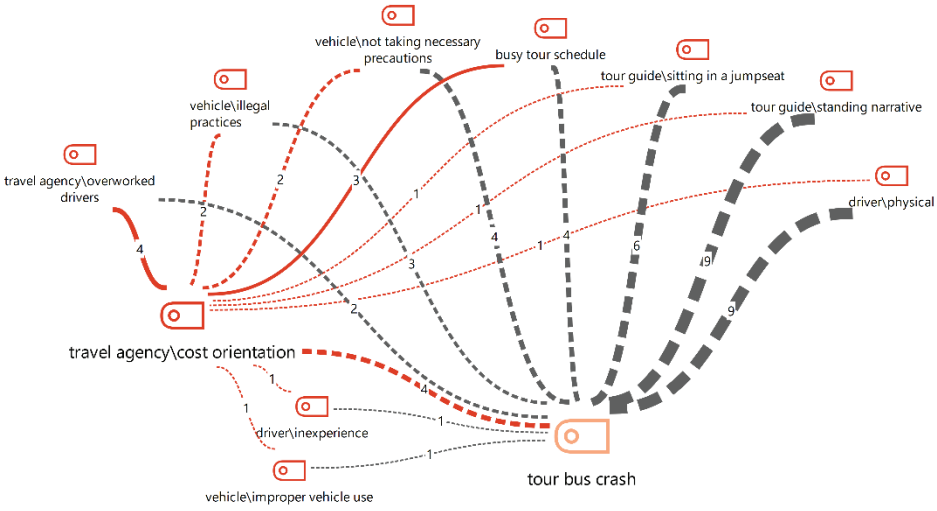
Figure 5 shows the relationship between the sub-codes of unsafe conditions and TBCs. According to this figure, travel agencies play important role in the crashes (UC: 14%, SC: 44%) with the sub-codes of cost orientation and busy tour schedules. The travel agency is followed by the physical environment with sub-codes of vehicle (f=8), road, and weather conditions (f=6). Another important code regarding TBC is the night ride (f=4), which is a common practice in domestic tours due to the nature of the business (structural) and one of the top unsafe conditions.

Figure 5: **Code Intersections between Unsafe Conditions and the TBCs**



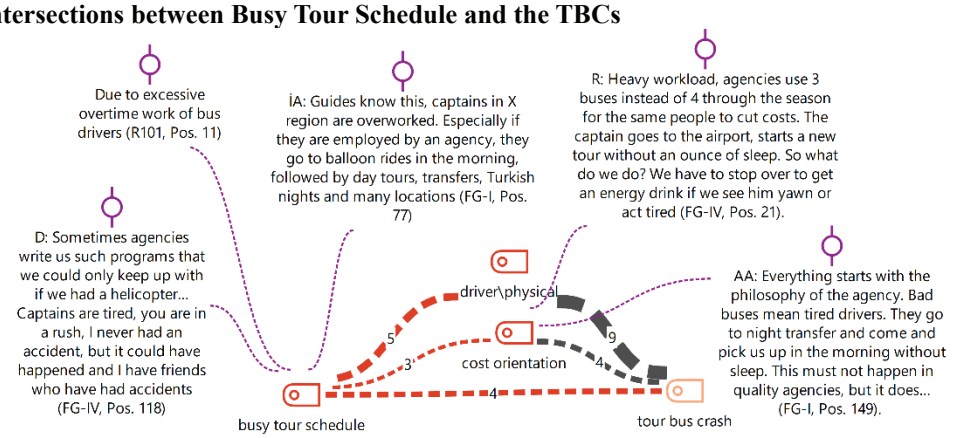
To understand the role of travel agencies in TBCs, code intersection analysis was performed with cost orientation. In Figure 6, codes explaining the relationship between cost orientation and TBCs have been determined. Accordingly, codes such as all the physical conditions of the driver leading to TBCs, the guide's standing narrative, and sitting in a jump seat which may result in work-related injuries or deaths are closely associated with the travel agency's cost-oriented approach. The travel agency's cost orientation is also related to recruiting one driver and the busy tour schedule.

Figure 6: **Code Intersections between Cost Orientation and the TBCs**



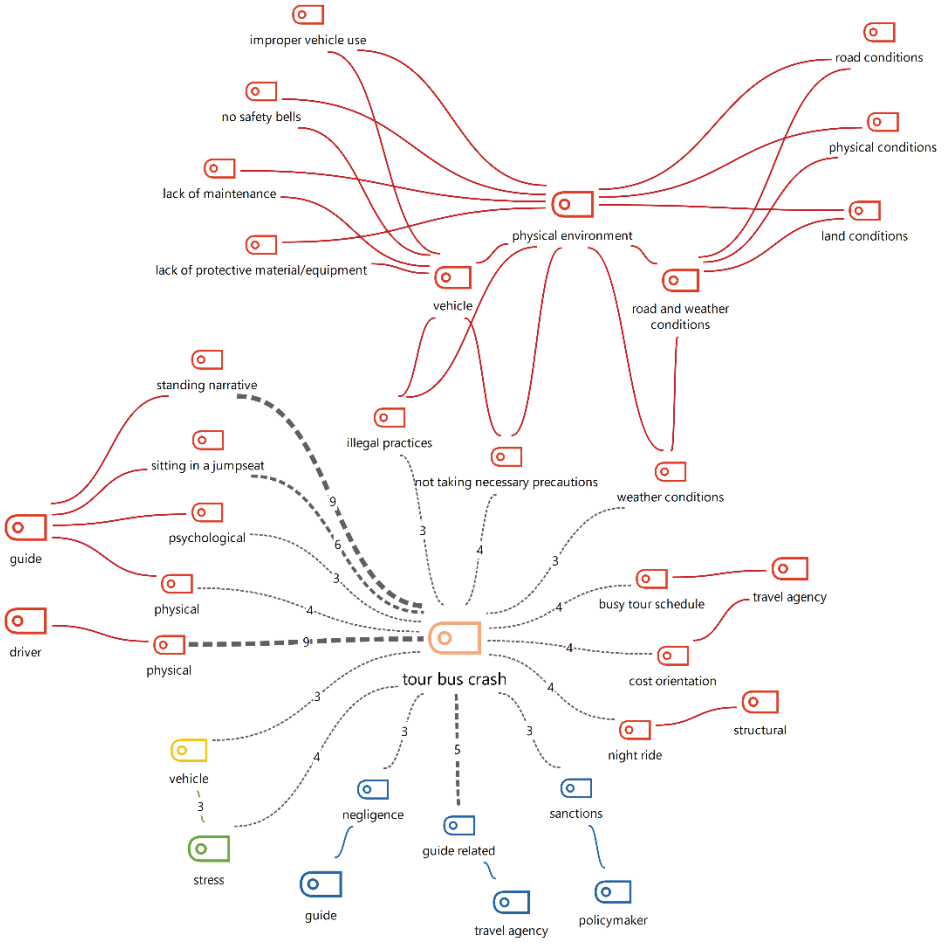
The results of the code intersection analysis which was performed to make a more detailed assessment of the busy tour schedules are also similar to the results above. Codes greater than three are included in the analysis to get a better understanding of the effect of the busy tour program (Figure 7). Driver's physical condition and cost orientation of the travel agencies are highly correlated with both busy tour schedules and TBCs. TGs' expressions on drivers' busy tour schedules were also provided in the figure.

Figure 7: **Code Intersections between Busy Tour Schedule and the TBCs**



When the available findings are evaluated as a whole, the picture of TBCs can be seen explicitly. The results of the code intersection analysis between all related codes in the codebook and the TBCs are given in Figure 8. To make the figure more understandable, only codes with a frequency greater than three are included. Codes that directly and/or indirectly affect TBCs are in the center of the figure. On the upper side, the codes that create a butterfly effect in the TBCs are seen. The intensive tour programs prepared as a result of the cost orientation of the travel agencies combined with the fatigue and insomnia of the driver and the TG form the basis of the TBCs, and the smallest negativity related to the vehicle and/or the environment can initiate the butterfly effect. Here, instead of looking for the causes of the TBCs under the influence of the butterfly, it is important to find out the real reasons.

Figure 8: **Butterfly Effect - TBCs and Related Codes**



4. DISCUSSION AND CONCLUSION

This study investigates the reasons behind the WRAs, TBCs in particular to enlighten the OSH situation in the tours from the TGs' perspectives. Unsafe behaviour and unsafe condition concepts were applied to have a clear understanding. According to the research results, TBCs are the leading type of WRAs with more than half of the WRAs. TBCs (39%) are also one of the most common WRAs for TGs in Turkey according to a study made by Ulusoy et al. (2021).

Unsafe behaviours of tour guides and drivers seem to be the most important risk factors behind TBCs. TGs' inexperience and negligence such as standing narrative, sitting in a jump seat, not wearing a seat belt, and physical conditions such as tiredness and insomnia, and also stress factors lead to fatal or nonfatal injuries in TBCs. Negligence (18.5%) of the TGs in WRAs is consistent with the study of Ulusoy et al. (2021). Büyüktepe et al. (2019) also addressed the inexperience of the TGs and jump seat problems in Turkey. Although negligence of the TGs is included in the literature, the reasons behind it have been revealed for the first time with the findings of this study. The research findings show that the faulty behaviors of the TGs such as sitting in the jump seat and standing narrative, which cause the most injuries at TBCs, are related to the cost-oriented nature of the travel agencies. Revealing this relationship is one of the most important findings of the study.

While TGs' negligence constitutes an important risk factor for only themselves, drivers' unsafe behaviours affect multiple sides inside and outside of the tour bus. However, drivers behave faulty mostly because they are very tired, and sleepless and there is no second driver to replace him/her during the tour. Many studies have revealed that accidents in the USA and Europe are pretty connected with fatigue due to long-distance driving (Wang et al., 2010). Although Ulusoy et al. (2021) did not mention the hard working conditions of the drivers, driving without resting (7.4%) reflects a similar result to this study. Especially as a "silent killer" fatigue driving (Zhang et al., 2016) which is mostly not noticed as an accident reason is one of the primary risk factors due to drivers in road crashes (Wilks et al., 1999; Lucidi et al., 2013; Huting et al., 2016; Zhang et al., 2016). The reasons behind drivers' faulty behaviour were mainly busy tour schedules and cost orientation which are addressed as social/organizational risk factors in this study. Travel agencies are mostly small-scale (98%) and can be considered capital-low businesses as they do not require high investment capital (SGK, 2021). When the challenges of the seasonality of the tourism industry are also considered, low-capital agents are expected to have higher TBC risks (Chang & Yeh, 2005, 330). The primary findings of this study are to reveal the reasons behind the unintentional faulty behavior of drivers originating from the practices of travel agencies.

However, other reasons also contribute to TBCs. Some studies point out weather and road conditions and vehicle-related problems (Zegeer et al., 1994; Wilks et al., 1999; Tseng, 2012; Goh et al., 2014; Huting et al., 2016; Bellos et al., 2020; Wen & Xue, 2020; Barabino et al., 2021). These are also consistent with our findings. The structural reasons specific to the tour guiding profession such as tourist attraction points far from city centers having unfavorable roads and terrain conditions, the continuity of tourism activities in harsh seasons, and continuous travel on the roads are important factors. While the conditions created by these physical conditions alone increase the risks of TBC, the practices of travel agencies make drivers more prone to accidents. Even if these practices of the travel agencies do not end with an accident, non-fatal/fatal injuries may occur because of sudden brake and the negligence of inexperienced tour guides.

Although the contribution of travel agencies to TBCs seems to be relatively small, they have the biggest responsibility for taking precautions. According to the findings, travel agencies can decrease TBC risks in four ways: guide-related, driver-related, tour-related, and vehicle-related. There are important steps the travel agencies should take to ensure a safe environment i) reconsidering the working conditions/hours of the tour guides and allowing them to rest, providing the guide seat and/or rotating seat, and microphone to prevent standing narration, which is one of the most important reasons for injuries ii) having two drivers on the tours, resting the drivers by reducing the working hours iii) having the vehicles checked and maintained regularly and renewing old vehicles iv) diminishing the intensive tour program, avoiding the night travel, and acting quality-oriented.

The control of the inappropriate practices of travel agencies and taking the necessary measures to establish a safe working environment are the duties that the policymakers should fulfill. The inexperience and lack of training of the tour guides in the establishment of safe behavior come to the fore. OSH training at schools and workplaces should be given priority to raising awareness.

In this study, TBCs and related injuries are discussed within the scope of work accidents from the perspective of tour guides. TBCs were evaluated based on quantitative and qualitative data obtained from the tour guides. The representative sample in both studies reflects the characteristics of the entire population and research findings were supported by different studies. It would be appropriate to take into account not only the opinions of the tour guides but also the views of other parties (drivers, travel agency officials, and tourists) in future studies. Besides, occupational accident reports, hospital records, and related statistics can be used.

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