Review Article

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Effectiveness of Interventions for Prevention of Road Traffic Injuries in Iran and Some Methodological Issues: A Systematic Review

Saber Azami-Aghdash[1], Homayoun Sadeghi-Bazarghani[1], Mahdiyeh Heydari[2], Ramin Rezapour[2], Naser Derakhshani[2*]

[1]Road Traffic Injury Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
[2]Iranian Center of Excellence in Health Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran.

***Corresponding author:** Naser Derakhshani*
Address: Iranian Center of Excellence in Health Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran.
Tel: +98-41-33352291
e-mail: Derakhshani.mhc@gmail.com

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ABSTRACT

Objective: To review the effectiveness of Road Traffic Injuries (RTIs) interventions implemented for prevention of RTIs in Iran and to introduce some methodological issues.
Methods: Required data in this systematic review study were collected through searching the following key words: "Road Traffic Injuries", "Road Traffic accidents", "Road Traffic crashes", "prevention", and Iran in PubMed, Cochrane Library electronic databases, Google Scholar, Scopus, MagIran, SID and IranMedex. Some of the relevant journals and web sites searched manually. Reference lists of the selected articles were also checked. Gray literature search and expert contact was also conducted.
Results: Out of 569 retrieved articles, finally 8 articles included. Among the included studies the effectiveness of 10 interventions were assessed containing: seat belt, enforcements of laws and legislations, educational program, wearing helmet, Antilock Braking System (ABS), motorcyclists' penalty enforcement, pupil liaisons' education, provisional driver licensing, Road bumps and traffic improvement's plans. In 7 studies (9 interventions) reduction of RTIs rate were reported. Decreased rate of mortality from RTIs were reported in three studies. Only one study had mentioned financial issue (Anti-lock Brake System intervention). Inadequate data sources, inappropriate selection of statistical index and not mention about the control of Confounding Variables (CV), the most common methodological issues were.
Conclusion: The results of most interventional studies conducted in Iran supported the effect of the interventions on reduction of RTIs. However due to some methodological or reporting shortcoming the results of these studies should be interpreted cautiously.

Keywords: Effectiveness; Interventions; Prevention; Road traffic injuries; Methodological issues.

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Introduction

Each year, 1.2 million people are killed and 50 million others are injured by RTIs [1]. In the United States, around 500 thousand people are killed by RTIs in each year [2]. Around 85% of mortality and 90% of permanent damages caused by RTIs take place in low and Middle Income Countries (LMICs) [3]. However, only 40% of world's vehicles belong to these countries [4]. In recent years, numbers of RTIs have increased significantly in Persian Gulf countries. This has created major problems for social and health systems of these countries [5-9].

In Iran, RTIs are the main cause of permanent injuries and the second cause of death [10, 11]. Number of RTIs in Iran is four times the number of accidents in High Income Countries (HICs) [12]. On average, each day 64 people are dead and 1967 people are injured by driving accidents in Iran [13, 14]. It has been estimated that 2271 years of life and 6 thousand billion Tomans are annually lost in Iran due to RTIs [15]. In the world, the proportion of number of deaths caused by RTIs to the number of vehicles is 3 to 10 thousand. In Iran, this proportion is 33 to 10 thousand [16, 17].

In recent years, in Iran and many other LMICs, large scale initiatives have been conducted to reduce the number of RTIs [18-22]. According to reports released by Iranian Traffic Police, some of these measures such as heavy punishments for high speed, improving the safety equipment of vehicles, and increasing fines have been relatively effective in reducing the number of driving accidents. On the other hand, measures such as increasing the budget of police, improving safety of roads, using surveillance cameras, improving medical cares, and improving infrastructure (particularly in railroads) have not been effective in reducing the number of accidents [23]. Considering shortage of budget and resources (especially in developing countries), it is necessary to adopt effective policies to solve such problems. It is particularly important for RTIs, because it is a very large scale problem and involves a large amount of budget [24-28].

Obtaining reliable information about the results of interventions and implement plans to reduce the number of RTIs is vital. Such information can help authorities to adopt effective policies to reduce the number of RTIs. To achieve this objective, it is necessary to collect and analyze the data of past studies. Because of the importance of preventive measures to reduce RTIs and also the shortage of reliable data, the aim of this study was to review the effectiveness of RTIs interventions implemented for prevention of RTIs in Iran and to introduce some methodological issues.

Materials and Methods

This systematic review study was conducted in 2017, using the approach adopted from the book "A Systematic Review to Support Evidence-Based Medicine"[29].

Eligibility Criteria

The inclusion criteria for the study were: articles on the RTIs area, articles that report interventions result in RTIs area, articles conducted in Iran, articles published in Persian and English language. Conference presentations, case reports and qualitative studies were excluded.

Information Sources

Required data were collected searching the following key words: "road traffic injury", "road traffic accident", "road traffic crash", "road traffic collision", "road traffic prevention", "intervention" and Iran. The following databases were searched: Google Scholar, PubMed, Scopus, MagIran, Iranian Scientific Information Database (SID) and IranMedex. The complete search strategy for PubMed databases is shown in Table 1. Some of the relevant journals (Journal of injury and violence research, Bulletin of Emergency and Trauma, Archives of Trauma Research, Journal of Safety Promotion and Injury Prevention, Trauma Monthly, Traffic Management Studies, Journal of Medical Council of Islamic Republic of Iran, Traffic Injury Prevention) and web sites were searched manually. Reference lists of the selected articles also were checked. In the final stage of the literature review, we also searched the gray literature and did expert contact. In order to check the grey literature, the European Association for Grey Literature Exploitation (EAGLE) and the Healthcare Management Information Consortium (HMIC), ProQuest and IranDoc databases were searched. The literature search was done up to September 2017.

Data Extraction

In the first phase of the review process, an extraction table was designed in Excel Microsoft that included the following items: first author's name, study publish year, Study design, aim of study, study time period-before and after intervention, data source, main results, author conclusion. Validity of the data extraction table was improved by experts, and a pilot study (with 2 articles) was conducted for further improvement of the extraction table. Two authors (A-AS and D.N) who had enough experience and knowledge were responsible for independently extraction of the data.

In first phase of article selection, non-relevant articles were excluded. In the second phase, the abstract and full texts of articles were reviewed to include those that matched the inclusion criteria. Reference management (Endnote X7) software was used for organizing and assessing the titles and abstracts, as well as for identifying the duplicate entries.

Table 1. Complete search strategy for PubMed databases

Set	Strategy	Results
#1	((((((((((road[Title]) OR traffic[Title]) OR injury[Title]) OR accident[Title]) OR crash[Title]) OR collision[Title]) OR Motor Vehicles[Title]) OR motorcycle[Title]) OR pedestrians[Title]) OR car[Title]) OR automobile[Title]	67026
#2	Iran[Affiliation]	111757
#3	#1 AND #2	390[a]

[a] Filters activated: Journal Article, Full text, Humans, English

Quality Assessment

Two reviewers evaluated the articles according to the checklist for before-after (pre-post) studies with no control group. This tool was developing by National Heart, Lung, and Blood Institute (NHLBI) and composed 12 questions. Each rater answers the questions as a "Yes", "NO", "Not reported", "Cannot determine" and "Not applicable" [30]. Reviewers scoring the studies as good (≥60% of total score), moderate (40– 59% of total score) and poor (<39% of total score). Controversies between these reviewers were referred to a third author.

Data Analysis

The extracted data were reported in an extraction table. In this study manually descriptive Content-Analysis method was applied for data analyzing. In this method themes from texts were detect, categorize and report.

Results

Out of 571 retrieved articles, 179 articles were excluded due to duplicated. Also, 378 other articles were excluded after the examination of their titles and abstracts, and 6 articles were excluded after full text review. Finally, 8 articles were selected for the study (Figure 1).

A summary of the data of all articles has been given in Table 2. Among the 8 reviewed articles, six studies have been conducted before and after intervention, one of them was an intervention controlled study, and another one was a cohort study.

Effectiveness of 10 interventions included: seat belt, enforcements of laws and legislations, educational program, wearing helmet, (ABS), motorcyclists' penalty enforcement, pupil liaisons' education و provisional driver licensing, road bumps and traffic improvement's plans were assessed.

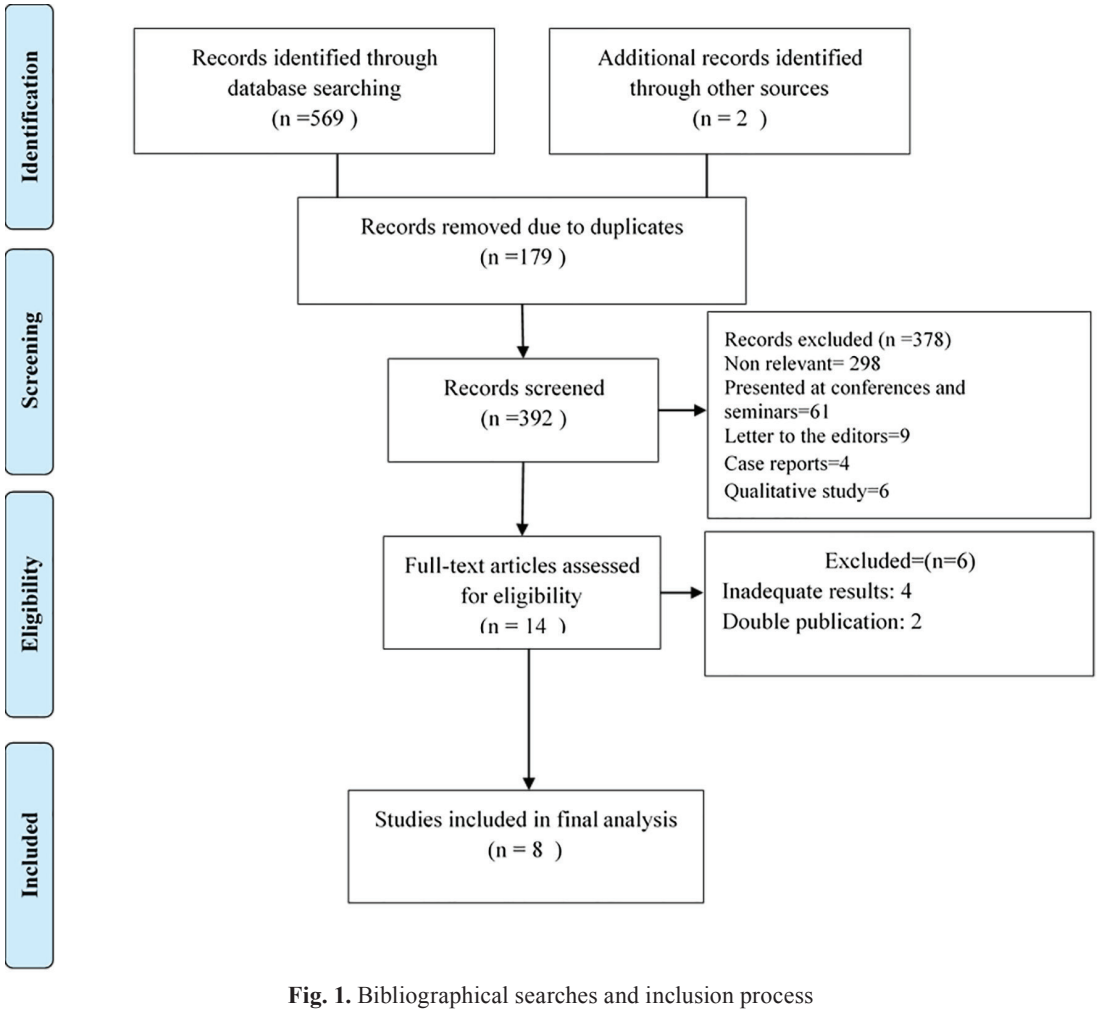

Fig. 1. Bibliographical searches and inclusion process

Table 2. Characteristics of the included studies.

Author-Year	Study design	Aim	Study time period-before and after intervention	Data source	Main results	Author conclusion
Khorasani-Zavareh, *et al.* 2013[19]	historical cohort	compare the claimed annual incidence rate and financial losses due to RTCs in Anti-lock Brake System (ABS) vs. non-ABS personal vehicles	one year	telephone survey	The incidence of RTC with another vehicle due to brake failure was 50.3 (42.9-58.5) for 1000 non ABS vehicle-years and 30.0 (21.2-41.2) for 1000 ABS equipped vehicle-years (P<0.05), The mean financial loss due to reported RTCs was $987.9 ± $1547.3 US and there was not a statistically significant difference between study groups	Law enforcement to maintain safe distance and adhere to speed limit while driving is needed to raise the effectiveness of ABS. This is as necessary as considering mandatory outfitting of ABS
Soori H. *et al.* 2009 [21]	before and after ex-perimental study	Effect of mandatory seat belt use legislations on reducing traffic injuries and the intensity of road traffic injuries (RTIs).	one year before until two years after the implementation	police department	The results showed that traffic mortalities consisted 13% of all RTIs in the year prior to the implementation, while it decreased to 9.7 % (95% CI: 9.6-9.9) and 11.4 % (95% CI: 11.3 -11.6) in the first and second years after the implementation, respectively. The trend of mortality reduction was not consistent in the two years,	mandatory seat belt use was efficient in reducing the intensity of RTIs and it was also efficient in reducing the crude number of RTIs
Yunesian M. *et al.* 2007 [31]	Before and after evaluation	Effects of specific project on decreasing hazards attributable to motorcyclists on the incidence and severity of road traffic accident injuries in Tehran.	One month before, one month after and one month in same month in last year	hospital records	Daily number of accident injuries increased in the intervention period (P=0.008), but the incidence of severe injuries (P<0.001) and also head and neck injuries (P=0.001) was decreased	The offender motorcyclists' penalty enforcement project was not successful in decreasing the incidence of traffic accident injuries, although it caused a shift to less severe injuries in Tehran
Soori H. *et al.* 2009 [22]		comparison of epidemiological measures of RTIs before and 2 years after the four traffic police enforcements and preventive programs	one year before and 2 years after	Traffic Police and Iranian Legal Medicine Organization	Two years after the interventional programs there was a decrease rate of deaths from RTIs per 100 000 population (OR= 0.83, 95% CI= 0.82-0.85), and per 10 000 vehicles (OR= 0.56, 95% CI= 0.55-0.57) in Iran. There was also a significant decrease for morbidity rate from RTIs per 10 000 vehicles after the interventions (OR= 0.68, 95% CI= 0.67-0.68).	Findings showed the effectiveness of traffic police interventions in Iran on fatal and non-fatal road traffic injuries.
Soori H. *et al.* 2010 [33]	Before and after trial	Role of pupil liaisons' education on social discipline promotion and road traffic injury prevention.	six month before and six month after	Questionnaire and Traffic Police	Recorded offences by traffic police before the intervention for these families was 2789 cases. A significant differences with 17.9 percent reduction in offences were observed after intervention (2290 cases, P<0.001). The most offences reduction were eating and drinking during driving (92.7%).	Pupil liaisons' program was effective on reduction of driving offences.

Nasermoadeli A. *et al.*2009 [32]	Controlled interven-tion study over time	investigated efficacy of provisional driver licensing on reducing traffic injuries and the intensity of injuries (fatal or non-fatal)	one year before till two years after	traffic police data base	Drivers under 23 years of age consisted 22.8% of total RTIs in the year prior to the implementation of graduate driver licensing. This proportion reduced to 15.5% and 16.1% in the first and second year after implementation, respectively, among holders of provisional B1 type driver license (P<0.001).	findings suggested that this intervention was efficient in reduction of intensity of traffic injuries and provisional driver licensing was also efficient in reducing the crude number of traffic injuries
Ahadi MR. *et al.* 2010 [34]	Before and after evaluation	The efficiency of traffic projects in improving traffic and reducing number of accidents	one year before and one years after	police department	Number of accidents in Shahid Raja'I Street significantly reduced. Although the plan was not effective in reducing number of accidents in Kashani Crossing, the total number of accident reduced after the implementation of the plan. Number of accidents reduced from 126 (one year before intervention) to 111 (one year after intervention)	Traffic plans were effective in reducing driving accidents and facilitating transportations
Vafaee R. *et al.* 2013 [35]	Before and after evaluation	effect of the road bumps on incidence of RTIs	one month before and one month after	Questionnaire	Average number of patient referred to hospitals caused by RTIs and serious injuries (fractures and lacerations) decreased (p<0.001)	Road bumps intervention changes in the pattern of RTIs and reduced the incidence of major injuries.

The lengths of periods before and after intervention were not the same. In three studies, data had been collected 1 year before intervention and 2 years after intervention. In one study, data has been collected 6 months before and 6 months after intervention. In two studies, data had been collected 1 month before intervention.

The majority of these data had been collected by traffic police (five out of eighth studies). One study had been conducted by telephone interviews [19]. The data of another study had been collected through hospitals [31]. The data of only two studies had been collected from more than one source [22, 32]

Khorasani Zavareh investigated number of traffic accidents and losses caused by these accidents among vehicles having ABS brakes (1232 vehicles) and vehicles which did not have this system (3123 vehicles). These data were collected by telephone interviews. The results of this study showed that vehicles which had ABS brakes had a significantly lower number accidents compared to other vehicles. The difference between costs caused by these two groups of vehicles was not significant. %61.1 of participants said that ABS brakes had helped them to prevent an accident. However, %44.1 of participants said that they did not know how to use ABS brake [19].

In a study which conducted by Soori *et al*. found that after the implementation of this law, number of deaths caused by accidents had reduced from %13 to %9.7 and %11.3 in the first and second years respectively. However, it can be seen that number of deaths in the second year was higher than the number of deaths of its pervious year (%1.6 increase). They concluded that safety belt law had been effective in reducing number of deaths and injuries. Therefore, it is necessary to encourage people to use safety belt during driving [21].

In a study which conducted by Moadeli *et al*. found that in all driving accident cases throughout the year before the implementation of law, %22.8 of drivers (who had grade 2 driving license) were under 23 years old. In the first and second years after the implementation of law (temporary B1 driving license for drivers who were under 23), this figure reduced to %15.5 and %16.1. This %7 reduction in the number of driving accidents among drivers who were under 23 showed that this law had been effective in reducing the number of driving accidents. Authors of this article concluded that driving with conditional driving license, cancelation of driving license in case of repeated violations, assigning negative points for violators, and the suspension of driving license are measures that could reduce number of driving accidents [32].

In a study which conducted by Soori *et al*. found that after the implementation of 'Police Supporters Plan", number of traffic law violations had a reduction of %17.9 The majority of this reduction was related to those accidents which had been caused by eating and drinking during driving. Drivers were taught

about nine cases that might cause driving accidents. Number of accidents caused by eight cases reduced. However, number of accidents caused by mobile phone increased [20].

In a study which conducted by Younesian *et al*. found that the average number of injured people (caused by accidents) brought to Sina Hospital in the first month after the implementation of law was higher than the number of injured people brought to hospital throughout the month before the implementation of the law. This number was also larger than the number of injured people brought to this hospital in the same month of pervious year. However, these injuries were less severe after the implementation of the law. Also, number of head and neck injuries reduced after the implementation of law [31].

In a study which conducted by Soori *et al*. (2009) found that number of deaths caused by driving accidents reduced from 38.2 in 2004 to 31.8 in 2008 (in every 100 thousand people). For every 10 thousand vehicles, number of deaths reduced from 24.2 to 13.4. A similar reduction was observed in injuries caused by driving accidents. They concluded that the measures taken by traffic police had been effective in reducing the number of driving accidents and deaths [22].

Ahadi *et al*. (2010) investigated the effectiveness of traffic improvement projects in order to solve traffic problems and reduce the number of driving accidents in Kashan. The results of their study showed that these measures were effective in reducing the number of driving accidents and improving traffic conditions of this city [34].

Vafaee *et al*. evaluated effect of the road bumps on incidence of RTIs in Kashan city. Data of The RTIs and their characteristics were collected one month before and one month after the road bumps intervention. One month after the intervention Average number of patient referred to hospitals caused by RTIs and serious injuries (fractures and lacerations) decreased ($p<0.001$). Authors concluded that road bumps intervention changes in the pattern of RTIs and reduced the incidence of major injuries [35].

Common Problems of Methodology

Problems in Data Bases

Among the seven articles that were used in this study, five articles were based on the data collected by traffic police. Authors of these articles have reported some problems and deficiencies in these data. Data of one study had been collected by telephone interviews. In another study, data had been collected from hospitals. If several sources had been used to collect the data, more reliable data would have been obtained. In only two studies, the data had been collected from several sources.

Using Inappropriate Statistic

Among the seven articles, only one article had used 'add ratio' and six articles had used P-value index. In one article, level of significance of intervention had been mentioned. However, its value had not been calculated. Also, in reporting central tendency values, some articles had not mentioned confidence interval.

Not Including Confounding Variables

In these seven studies, only one study had used adjusted method and three studies had included the impact of other interventions and factors. Except traffic improvement intervention, other interventions were implemented across the country. However, in some of these studies, the data of one particular area had been collected. Since the conditions of various areas in the country are very different, the findings of these studies cannot be generalized to other areas of the country.

The results of quality assessment of included articles are shown in Table 3. Out of 8 studies, three studies rated as good, four studies as moderate and one study as poor.

Discussion

The results of this study showed that the majority of interventions had been effective to reduce the number of traffic accidents. Police supporters` plan, safety belt law, the plan of using ABS brakes in vehicles, and the issuance of temporary driving license, road bumps and training for permanent driving license were some of the interventions that had been implemented to reduce the number of driving accidents and subsequent damages.

'Police supporters' was a plan that intended to teach traffic regulations to children. This plan was conducted in 2007 with the cooperation of traffic police and educational departments. In this educational plan, students were taught about 9 cases that might cause accidents and subsequent injuries (high speed, overtaking prohibition, changing movement direction, talking on the mobile phone during driving, talking with others during driving, not using safety belts, eating and drinking during driving, and not paying attention to driving signs and traffic lights). Students were taught that when they see such cases, they have to tell the drivers not to breach traffic laws and report such cases, if necessary. Results of a study conducted by Soori *et al*. showed that this plan had managed to reduce the number of traffic violation up to %17.9 [20]. Similar educational projects have been conducted in other countries, such as a project that started from 1951 in England [36] or another project that began in 1954 in North America[37]. In India, the plan of 'Traffic Police' offers students special education about traffic laws[38]. The findings of Soori's study showed that in short term, 'Police supporters' plan had been successful in reducing the number of traffic law violations. Since most of these police

Table 3. The quality assessment of included article

Author-Year	Scale Items												
	1	2	3	4	5	6	7	8	9	10	11	12	Score
Khorasani-Zavareh, *et al*. 2013[19]	Y	Y	Y	Y	Y	N	Y	N	N	Y	N	NA	G
Soori H. *et al*. 2009 [21]	Y	N	Y	CD	Y	N	Y	N	N	Y	N	NA	M
Yunesian M. *et al*. 2007 [31]	Y	Y	N	CD	Y	N	Y	N	N	Y	N	NA	M
Soori H. *et al*. 2009 [22]	Y	N	Y	Y	Y	N	Y	N	N	Y	N	NA	G
Soori H. *et al*. 2010 [33]	Y	Y	N	CD	Y	N	Y	N	N	Y	N	NA	M
Nasermoadeli A. *et al*.2009 [32]	Y	Y	Y	CD	Y	Y	Y	N	NR	Y	N	NA	G
Ahadi MR. *et al*. 2010 [34]	Y	Y	N	CD	CD	Y	Y	N	NR	N	N	NA	P
Vafaee R. *et al*. 2013 [35]	Y	N	CD	Y	Y	N	Y	N	NR	Y	N	NA	M

1- Was the study question or objective clearly stated?, 2- Were eligibiCDlity/selection criteria for the study population pre-specified and clearly described?, 3- Were the participants in the study representative of those who would be eligible for the test/service/intervention in the general or clinical population of interest?, 4- Were all eligible participants that met the pre-specified entry criteria enrolled?, 5- Was the sample size sufficiently large to provide confidence in the findings? 6- Was the test/service/intervention clearly described and delivered consistently across the study population? 7- Were the outcome measures pre-specified, clearly defined, valid, reliable, and assessed consistently across all study participants? 8- Were the people assessing the outcomes blinded to the participants' exposures/interventions? 9- Was the loss to follow-up after baseline 20% or less? Were those lost to follow-up accounted for in the analysis? 10- Did the statistical methods examine changes in outcome measures from before to after the intervention? Were statistical tests done that provided p values for the pre-to-post changes? 11- Were outcome measures of interest taken multiple times before the intervention and multiple times after the intervention (i.e., did they use an interrupted time-series design)?, 12- If the intervention was conducted at a group level (e.g., a whole hospital, a community, etc.) did the statistical analysis take into account the use of individual-level data to determine effects at the group level? Y: Yes; N: No; NR: Not reported; CD: Cannot determine; NA: Not applicable; P: Poor; M: Moderate; G: Good

supporters will be future drivers, it is expected that such educational plans can help us to train more committed drivers and to have safer streets and roads in future. Therefore, such plans can be effective in reducing the number of driving accidents in both short and long terms.

Another intervention investigated by Soori *et al*. was safety belt law. The results of this study showed that safety belt law had been effective in reducing the severity of injuries caused by driving accidents. However, number of injuries in the second year after the implementation of law had a slight increase compared to the first year [21]. Results of this study and similar study projects show that using safety belt can significantly reduce the severity of injuries in driving accidents [39-41]. Lack of strong supervisory measures by traffic police light have been the reason for the small increase in the number of injuries in the second year after the implementation of law (compared to the first year of law implementation). Therefore, in order to reduce number of injuries, strong supervisory measures by traffic police and educating drivers about the benefits of using safety belt are necessary measures that need to be taken.

Using ABS brakes was another intervention that was effective in reducing the number of driving accidents and subsequent damages [19]. The findings of some other studies have also shown the advantages of using these brakes [42, 43]. As the authors indicate, there are two issues that need to be addressed: firstly, ensuring the safety and quality of these brakes; secondly, training drivers how to use these brakes.

Issuing temporary (one year) driving license and training for receiving permanent driving license was another intervention that was effective in reducing the number of driving accidents. Results of a study conducted by Begg et al showed that issuing temporary driving license reduced number of traffic accidents and subsequent damages (%8 reduction) throughout a period of five years in New Zealand [44]. Results of a study conducted by Mayhew et al indicated that issuing temporary driving license significantly reduced number of driving accidents in Canada [45]. A review study conducted by Russell *et al*. showed that issuing temporary driving license could reduce number of traffic accidents [46]. However, such findings should be considered with caution, because drivers who have temporary driving license might drive less than other drivers. Therefore, long term studies with more reliable methods should be conducted to exclude the possible impact of such factors.

The incomprehensiveness of data sources, using inappropriate statistics, and the impact of possible confounding variables were some of the factors that could have a negative impact on the preciseness of obtained data in these studies.

Incomprehensiveness of Data Sources

Various organizations that deal with traffic issues and driving accidents have their own data system. Traffic police, forensic medicine institutions, Red Cross, centers of intensive medical care, and some other organizations have special data bases for registering their data. It seems that the data bases of traffic police are more comprehensive and more reliable than the data bases of other organizations. However, the researchers of these studies have

reported some deficiencies even in the data bases of traffic police. Such problems in the data bases could have a negative impact on the accuracy of obtained results in these studies. In another study, data were gathered by telephone interviews. Underestimation, overestimation, and recall bias can have negative impacts on the data gathered in such studies [47]. The data of one study had been collected from hospitals. Originally, these data had not been collected for research purposes. Therefore, there were some deficiencies in these data [48]. Also, these data only included those injury cases that had been brought to hospitals. They did not include outpatient cases and also death cases that had happened at the scene of accident. Because of the key role that reliable data bases play in any research project, building comprehensive and reliable data bases is necessary. Such data bases must include data gathered from various sources.

Using Inappropriate Statistics

In such studies, it is better to use accurate statistic such as 'relative risk' and 'add ratio'. However, among the seven studies that were used, only one study had used 'add ratio'. In the six studies, P-value had been used which is less efficient in the analysis of data related to interventions [49, 50].

Not Including Confounding Variables

Since a lot of factors can be involved in increasing or decreasing the number of driving accidents, any change in the number of accidents cannot be attributed to only one factor. Therefore, in such studies, confounding variables must be controlled in order to obtain more accurate results [51-53]. In these seven articles, only in one article 'adjusted method' had been used. Also, three articles had included other interventions and factors. Except traffic improvement intervention, other interventions were implemented across the country. However, some of the studies had used the data gathered from a particular area. Because the conditions in various areas of Iran are extremely different, the data gathered from one area cannot be applied for other areas.

In recent years, a lot of interventions and plans have been conducted by responsible organizations in order to reduce the number of driving accidents. It is necessary to use scientific methods to analyze the data related to these interventions and plans. Also, the objectives of such analyses must be more profound (strengths and weaknesses, solutions, economical issues, policy-making, etc).

The main limitation of this study is due to existing heterogeneity in report of studies results and some methodological issue; in this regard we cannot conduct quantitative analysis (Meta-Analysis methods). Because in the case of the possibility of quantitative extraction of results and conducting Meta-analysis, the provision of better view of the effectiveness of interventions could be possible. Another limitation of current study is lack of studies that report results of interventions about RTIs prevention.

The results of most interventional studies conducted in Iran supported the effect of the intervention on reduction of RTIs. However due to some methodological or reporting shortcoming the results of these studies should be interpreted cautiously. The results of such plans should be analyzed on the basis of scientific methods. Also, proper solutions must be found to remove the problems that might have a negative impact on the obtained data on such studies.

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