

Original Article

Experts' perspectives on the application of public-private partnership policy in prevention of road traffic injuries

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ABSTRACT

Purpose: Successful application experiences on public-private partnership (PPP) in different countries, suggest that PPP could be an option in road traffic injury (RTI) prevention. The present study aims at investigating the applicability of PPP policy in RTI prevention in Iran based on the experts' perspectives. **Methods:** This is a qualitative study with grounded theory approach which has been conducted in Tabriz University of Medical Sciences, Iran in 2018. The participants were 22 experts in the field of RTIs selected using purposive sampling method. Data were collected by semi-structured interviews and analyzed with content-analysis method.

Results: The results were classified under 5 main themes (applicability, scopes and services, challenges, advantages, and strategies) for applying PPP policy and 37 sub-themes. Due to the prevalence of RTIs, the present challenges in public sector, existence of qualified private sector, and successful experiences in other areas, there are opportunities for private sector partnership in prevention of RTIs. Private sector could participate in different scopes and services regarding RTI prevention, including road construction and maintenance, maintenance and provision of vehicles safety and public education. The main challenges including legislation issues, ambiguities in collaboration, political and organizational unsustainability, government's financial hardship and lack of experienced experts in the field of RTI. However, there are significant advantages including high efficiency in program implementation, covering the weaknesses of public sector, effective and efficient management on application of PPP in RTI prevention. The strategies include identifying and prioritizing the assignable activities, identifying the qualified private sector, developing PPP policies and legal frameworks, creating a common language between public and private parties, trying to meet the expectations of the private sector by public sector, developing a comprehensive and sound contract, and cultivating public culture to accept private sector in the field of RTI prevention.

Conclusion: This study sought to determine whether PPP could be used as strategy to reduce the burden of RTIs in Iran. But it requires a lot of preliminary studies to provide the context and conditions for applying this policy.

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Introduction

Road traffic injuries (RTIs) are one the main causes of mortalities and morbidities in today's world.¹ It is estimated that 1.35 million

people die due to RTIs every year worldwide, and over 50 million were injured.² Estimations suggest that the rate will increase by 65% in the upcoming 20 years.³ It is also estimated that for each RTI-related death, 16 injuries lead to hospitalization and 400 injuries lead to use of outpatient services or transient activity restriction.⁴ Based on the results of global burden of disease study in 2016, RTIs ranked 8th out of 20 fatal causes and alone accounted for about 2.46% of total deaths, worldwide.⁵ Also according to

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monitoring reports of millennium development goals, RTI accounted for 24% of deaths by accidents.⁶ Also, RTIs were the leading cause of mortality in the age group of 5–29 years worldwide.²

Traffic accident prevention requires the integration of a wide range of measures such as the development and control of traffic infrastructure, the production of safe vehicles, the enforcement of laws, dynamic programs, the provision of quality health and hospital services, child support and different urban plans.^{7,8} In high income countries, a set of measures have been taken to prevent from RTIs significantly.^{9,10} One main strategy for RTI prevention is to benefit from private sector's capabilities and potentials in the form of public-private partnership (PPP). Hyder et al.¹¹ in their study concluded that multi-sectorial plans are an important characteristic for managing RTIs. These plans need for coordination across a variety of roles within and across sectors. These will include the public (governmental), and private (profit and non-profit) sectors.

PPP is a mechanism by which the public sector (government or other state organizations) use private sectors' (including cooperative, private, charities, non-governmental organizations (NGOs), etc.) capabilities such as knowledge, experience and financial sources to provide infrastructure services (water and waste water system, transportation system, health system, education system etc.). On the other hand, private sector, on behalf of government, play a role in providing services. In PPP, a contract is adjusted between public and private sector to share risks, responsibilities, and benefits and to the synergy of resources and specialties in providing infrastructure services.¹² In PPP, the government changes its role from investor, administrator, and beneficiary of infrastructure projects to policymaker, legislator and supervisor of services quality and quantity.^{13,14} PPP is actually a mutual collaboration that lead to the potentialities of both parties be used in achieving mutual goals.^{12,15} In recent years, different countries utilized this approach to prevent RTIs.^{16,17}

Traffic accidents are one of the main problems in Iran. To date, according to the country's approach, the traffic accident is a matter of sovereignty, and only the government deals with it. Experience has shown that the government's performance in the past has been weak in this regard so that it has not been able to control the growth trend of traffic accidents. Despite government's efforts to reduce road traffic accidents in Iran, the number of road traffic accidents in Iran is still high compared to the developed countries, even increased in recent years because of economic problems, budget shortages and inefficient government.^{18–21}

From the point view of researchers, the current paradigm should be changed, and the role of the government should be reduced to some extent, so that the capacity of private sector can be used to compensate government weaknesses.

PPP for RTI prevention has been around for at least 20 years and there is many well-known examples such as the Global Road Safety Partnership and the Make Roads Safe.^{11,22} But in Iran there is no such experience. RTI prevention with the participation of the private sectors is a new paradigm in Iran, so the regulatory oversight is critical in the beginning of the new experience: our proposal is PPP policy. Since private sector participating PPP has not occurred in RTI field in Iran, the first step is the applicability study. In this regard, applicability studies determine in which areas and in which cases a model can be used, and what requirements and infrastructure are needed.²³

Therefore, it was needed to investigate different aspects of this issue in the view of experts to complete the present knowledge in Iran and achieve better insight in this field. The present study is trying to evaluate the applicability of PPP policy in prevention of RTIs through experts' perspectives.

Methods

The present qualitative research was conducted in 2018 with grounded theory approach. Grounded theory approach is an inductive research method with complete qualitative approach. It is an exploratory research technique permitting the researchers to develop a new theory instead of using grand theories where there is no possibility of developing a hypothesis. Grounded theory is a way to gain insight into a topic or topics that have not previously been studied extensively and our knowledge about those topics is limited.^{24,25}

The present study was carried out in medical sciences universities, non-medical universities, relevant research centers, and organizations which are stakeholder in RTI (including Ministry of Roads and Urban Development, Ministry of Industry, Mine and Trade, Ministry of Health, Iranian Traffic Police, Iranian Legal Medicine Organization, Red Crescent Organization, and Iranian Emergency Medical Service Organization). The participants were academic members who have research in the field of RTI, heads of RTI related research centers, top authorities of organizations who are directly engaged in RTI and its prevention and vulnerable road users (pedestrians and motorcyclists). For their high levels of experiences and knowledge, these participants were included in our study. Inclusion criteria were: the academic members and heads of research centers who have published books, articles or any research projects in the field of RTIs, having at least 2 years of direct experience about RTIs, having Iranian nationality, being native in Persian language, and being tended and capable to participate.

For participant selection, the purposive sampling method was used. In this method those researchers who are highly knowledgeable and informed and able to share their knowledge were selected.^{26–28} This process lasted until data were saturated that researchers think no additional data will be added. Data saturation were achieved by the 22 experts in the present study. During the interviews the theoretical sampling was utilized to identify people who could provide useful data. Also, it was tried to have heterogeneous participants in terms of age, job, experience, education, and organizational post.

For data collection, semi-structured interviews in Persian language were applied. Interviews were conducted in locations where the interviewees feel safe and comfortable. During interviews, guiding questions designated using literature review and experts' comments. Interviews lasted between 45 min and 90 min (except for one case that was lasted only 20 min due to the high workload). People's comments were recorded by a tape recorder after obtaining their permission. The researchers also took notes during interview. Immediately after each interview, the researchers listened to the interview for several times and transcribed into the Microsoft office word software.

For data analysis, conventional content-analysis was used to identify, analyze and report existing themes (algorithms) in the text and has widespread utilization in the analysis of qualitative data. It is used when theories about the studied subject is limited.^{29–31} The steps of data analysis and coding were respectively: getting familiar with data (repeated reading of transcribed texts-data immersion), identifying and extracting primary codes, identifying themes (placement of extracted primary codes in relevant classes and themes), reviewing and completing identified themes, naming and explaining themes, recoding and renaming some classes and themes, and getting assured about codes reliability.

To increase the rigor and accuracy of results, four criteria proposed by Guba & Lincoln were used,³² respectively, (1) (2) credibility and confirm ability: the long term engagement and reviews by colleagues and also the comments provided by experts and professional were used. Respondent validity was also used after

each session, the opinions of the interviewee were summarized and a summary of what he/she said during the interview will be feed-backed to correct the wrong and ambiguous points. (3) Dependability: two researchers involved in the coding process. (4) Transferability: experts' opinions and purposive sampling were used.

In this study, bracketing was considered. The overall approach of the study was not to confirm or reject PPP. The PPP model was introduced as an option and its applicability was studied in the view of participants and there was no confirmation or rejection of PPP.

The study was approved by the Ethics Committees of the authors' institute (Ethical Number: IR.TBZMED.REC.1397.683). Written informed consent was obtained from all participants before the interview. In addition, the study objectives were initially explained to the participants.

Results

Fifteen participants were men and 7 were women. The mean age was 45 years (Table 1), 5 participants were from PPP department of ministry of health and emergency medical service organization, 4 from department of private sector participation affairs of ministry of roads and urban development, 4 experienced traffic police of Iranian traffic police, 5 with the story of studying in PPP or RTI from medical universities and RTI or PPP research centers and 4 were vulnerable road users (pedestrians, cyclists, motorcyclists).

Based on analysis of participants' perspective, 5 main themes and 37 subthemes were identified (Table 2).

PPP application background

For this theme, five subthemes were extracted. Most of the participants believed that considering low- and middle-income countries' situation, it is possible to apply PPP policy in these countries. They suggested that government and policy makers must pay special attention to this subject. One of the most important conditions is the existence of weaknesses and problems in public sector in prevention and reduction of RTIs. In this regard, a participant commented that "governments in developing countries are so busy with other different problems that they cannot make RTI as their first priority".

Another important issue highlighted by the participants in this area was the presence of NGOs that are devoted and interested to participate. A participant stated "NGOs, charities, and institutes like safety fans community can be applied here".

Table 1
Demographic variables of 22 participants in focus group discussion.

Variables	n (%)
Sex	
Men	15 (68.1)
Women	7 (31.8)
Age (year)	
30-40	5 (22.7)
41-50	11 (50.0)
51-60	5 (22.7)
> 60	1 (4.5)
Participants' organizations	
Ministry of health	5 (22.7)
Ministry of roads and urban development	4 (18.2)
Iranian traffic police	4 (18.2)
Researcher	5 (22.7)
Vulnerable road users	4 (18.2)

The area for applying PPP policy

Ten subthemes were classified under this topic. Two main points, mentioned by almost all participants, were the construction of freeways, highways and roads, and provision and maintenance of their safety. A participant mentioned that "the construction of freeways, highways, and roads can be assigned to the private sector". Another participant in this regard believed that "beside the construction of roads, the private sector can play a role in maintenance, I mean in its safety".

Providing and utilizing safety equipment (closed circuit television (CCTV) camera, warning signs, etc.) was another significant point proposed by the participants. A participant believed that "(private sector) can assist the ministry (referring to Ministry of Roads and Urban Development) by providing CCTV cameras and other facilities".

Challenges and problems of PPP application

Seven subthemes were extracted in this area as the most important challenges and problems. The most frequently mentioned point was the legislation issues. Most of the participants believed that legal system of public organizations in many cases lacked clear legislation in the field of PPP, which put the application of PPP for RTI management into a difficult circumstance. In this regard, one participant explained that "there are some laws in public sector that constraint the activities of private sector".

Another important issue was insufficient governmental budgets to meet their financial obligations. Most of the participants believed that due to the bad experience of failing to fulfil financial obligations or lengthy and repeated delay by public sector, the private sector does not tend to participate with public sector. A participant said that "the governments often have problem to pay to private sector and contractors, payments often happen with long delays".

Advantages of PPP policy application

Three subthemes were extracted in this aspect. A significant advantage pointed by most of the participants was the efficient and effective management in private sector compared to the public sector. In this regard, a participant stated that "it has been shown that the private sector is more efficient and performs better than our sector (refers to public sector); their (private sector) wasting costs are less".

Another important issue that noted by participants was that the weakness of public sector can be covered by private sector. In fact, the participants believed that private sector plays as the complementary role for public sector. In other words, government can benefit from the potential of private sector in those fields that they may have troubles. A participant explained that "whenever (refers to scope and services) the governments failed to do, can go to the private sector. These two sectors can complete each other".

Practical strategy and necessary infrastructure to have successful PPP application

In this area, 12 practical strategies and necessary infrastructure were extracted. A highlighted strategy, emphasised by most of the participants, was the identification and prioritization of possible fields and activities for participating of private sector. Participants believed that the public sector should firstly identify the areas and activities that could be assigned to the private sector and then based on their priority and importance, cooperate with private sector. A

Table 2

Main themes and subthemes extracted from experts' perspectives on the applicability of public-private partnership policy in prevention of road traffic injuries.

Main themes	Subordinate themes
PPP application background	<ol style="list-style-type: none"> 1. High intensity and extent of traffic accident problem 2. Pitfalls and problems of public sector to prevent and decrease RTIs 3. Existence of private sector which is empowered and interested in participation 4. Existence of committed and interested NGOs 5. Successful global experiences on PPP in different fields
The area for applying PPP policy	<ol style="list-style-type: none"> 1. Construction of roads, highways, and freeways 2. Safety provision and maintenance of roads, highways, and freeways 3. Providing and maintaining cars safety 4. Providing and maintaining safety tools (CCTV camera, warning signs, etc.) 5. Public education 6. Designing and implementing practical researches 7. Designing and implementing of social oriented interventions 8. Providing pre-hospital services to RTIs victims 9. Participating in control and monitor of drivers 10. Evaluating drivers' health (especially professional and elderly drivers)
Challenges and problems of PPP application	<ol style="list-style-type: none"> 1. Legislation issues 2. Ambiguous collaboration mechanisms 3. Public culture (People's attitude that RTIs prevention are government-centered and public sector should provide these services) 4. Changing policies with changing authorities Lack of government found 5. Structural problems 6. Lack of experienced and professionals experts in the field of RTIs
Advantages of PPP application	<ol style="list-style-type: none"> 1. Avoiding uncompleted projects and higher efficiency in administration of plans 2. Covering public sector' pitfalls by private sector 3. Effective and efficient management
Practical strategy and necessary infrastructure for successful PPP application	<ol style="list-style-type: none"> 1. Identification and prioritization of possible fields for participating with private sector 2. Identification of efficient and qualified private sector 3. Coordination and unification of PPP policies in public sector 4. Creating a common language between public and private sector 5. Designing a legal framework for PPP 6. Public sector's commitment and effort to provide least expected benefits of private sector 7. Utilizing NGOs in the subjects with high social acceptability 8. Designing and administering a proper tender program 9. Developing a comprehensive and sound contract 10. Full explanation of the subject to private sector and gaining their support 11. The use of start-up institutes 12. Cultivating public culture to accept private sector in the field of RTIs

PPP: Public-private partnership, RTIs: Road traffic injuries, NGOs: Non-government organizations, CCTV: Closed circuit television.

participant stated that “first of all, the scope and services on which public and private sectors can participate must be identified”.

Other important issue is to create a common language between public and private parties. The participants meant that all ambiguities must be eliminated, and responsibilities, procedures, and details of partnership must be fully and clearly explained. A participant stated that “at first, we should create a common language between both sectors; so that conflicts will never happen, and all issues must be fully explained for all”.

To solve the problem of financial deficits of public sector, some participants suggested that NGOs (who have great social acceptability) must be utilized in different tasks including public education and holding campaigns. A participant explained that “in some cases that we do not have enough resources and private sector demands too much money, (and cases with) high social acceptability we can assigned to the NGOs, they can provide great help”.

Fig. 1 shows the results of the study in the form of identified themes and subthemes.

Discussion

The aim of this study was to investigate the applicability of PPP policy in prevention of RTI based on the perspectives of the experts in this field. From point view of some people working in the RTI field, PPP for infrastructure may have benefits for RTI reduction. Most of the participants believed that the construction of roads, highways, and freeways and the associated services is one of the most effective factors in preventing RTIs which can be fulfilled by

PPP. For many governments, PPP seems to be interesting in this filed for several reasons such as anticipated economic benefits including value of money, allocative efficiency, and risk transfer to private sector and indirect payments of infrastructure provision.³³ It shows that a mixed intervention by both private and public sectors in transportation system can lead to allocative and economic efficiency.

Another important factor is insufficient governmental budgets that results in failure to fulfil obligations or long delays in payments by public sector. In study of Makula³⁴ in Tanzania, this issue has been emphasised. Their results showed that financial deficits and delays in payments can put the PPP plan in danger. Another challenge of PPP policy application, mentioned in this study, was insufficient experienced experts in the field. In the study by Parvu et al.,³⁵ a main challenge of PPP policy applicability in Romania was the lack of experienced experts in the field of PPP at central and local levels of the government. The authors believe that, since the reason behind this shortage was the long-term preparation process of PPP project, the lack of mentioned people can hinder the project.

Compared to the public sector, effective and efficient management in private sector is another great advantage of PPP, according to the stakeholders. Based on different researches' view, promoting efficiency is one of the main logical reasons to use private sector's financial resources and capabilities.^{36,37} Study results of Medda et al.³⁸ revealed that the most difficult part of the job for public sector is cost analysis that is a pivotal step to reduce the probability of negative consequences. This is more highlighted at the initial levels of PPP implementation process, where the reference price is

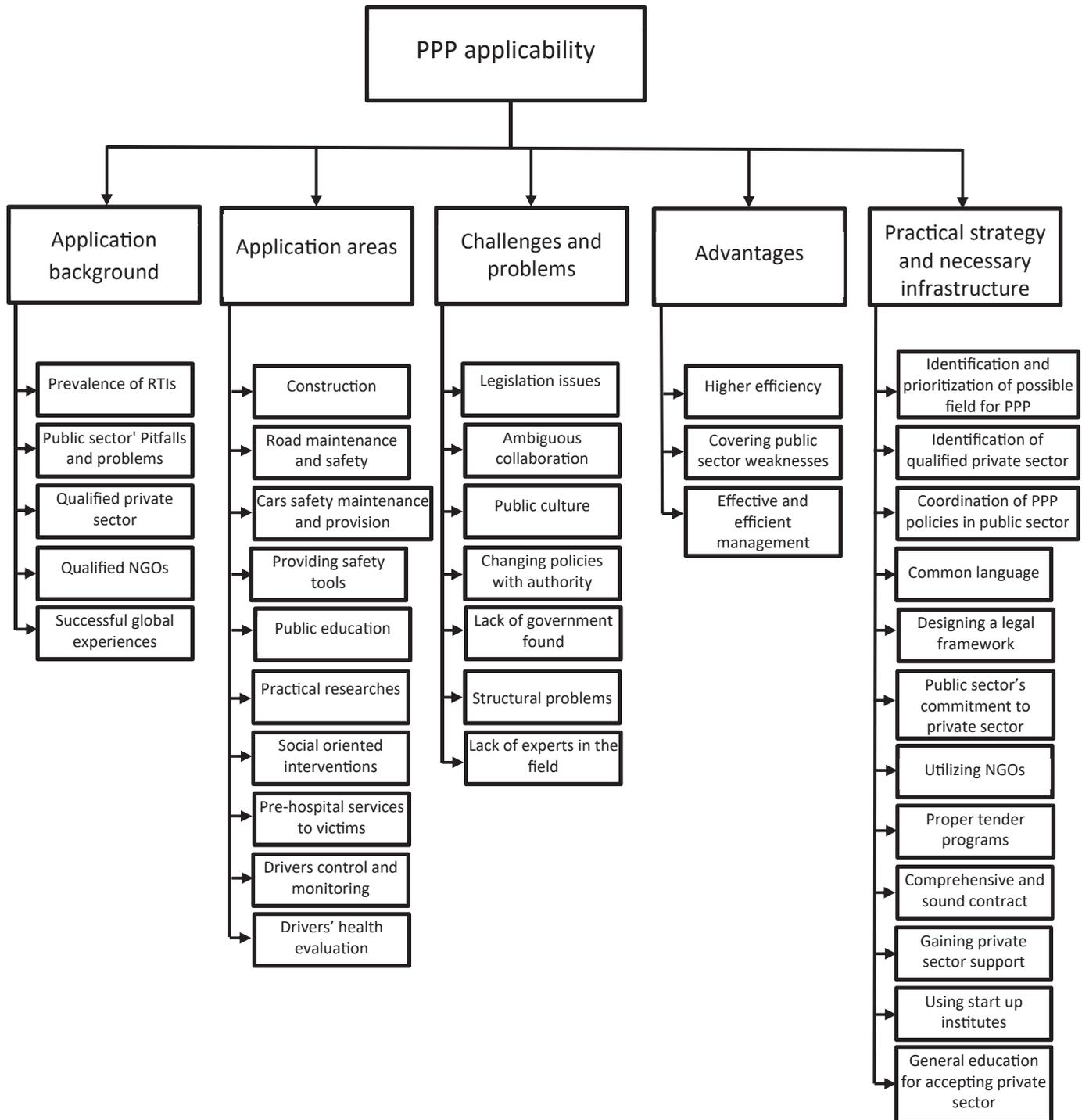


Fig. 1. Applicability aspects of public-private partnership in prevention of road traffic injuries.

not identified for contracts, calculating the monetary value can be greatly helpful. The participants believed in those fields that the public sector have problem to provide services, the private sector's potential can be used to cover weaknesses. In the study of Roehrich et al.³⁹ concluded that PPP can integrate private sector's obvious capabilities such as innovation, high technical knowledge and skill, managerial efficiency and entrepreneurship spirit with the characteristics of public sector such as social responsiveness, social justice, high experience and responsibility that lead to providing high-quality, low cost, accessible and effective services and care.

In a study by Hernandez-Aguado et al.,⁴⁰ revealed that helping the public sector in responding to health challenges, promoting the quality and capacities of providing health services, promoting self-control, and reducing unhealthy products and promoting the quality of products are listed as the most important benefits of PPP. Also, the results of Albalate et al.,⁴¹ who investigated the effect of traffic monitoring through PPP on road safety, showed that 17%–42% less traffic accident victims, 23%–47% less physical injuries, and 17%–94% less death happened in highways managed by private sector per kilometre. Also, in other studies decreasing

projects implementation time and promoting service quality, have mentioned as the advantages of PPP.^{42,43}

The identification and prioritization of areas and services that could be assigned to private sector in the format of PPP was mentioned by participants as one of the effective strategies to implement PPP plans in the field of RTIs. In the study by Hernandez-Aguado et al.,⁴⁰ reported necessities and suggestions for the application of PPP policy include: clear and accurate formulation of general principles of PPP design and management, providing accurate definition of private sector's duties and responsibilities, and exactly defining the criteria for the selection of partner/private sector (individual, industry, company). Creating a common language between two public and private parties was another important issue in this field. Here the participants meant to eliminate all ambiguities, fully and clearly explain the tasks, determine the procedures and details of partnership. In study of Maluka,³⁴ the lack of a common language was pointed out as a main challenge of PPP and introduced the inappropriate designing of outsourcing process as its reason. The study of Parvu et al.,³⁵ concluded that because of the lack of supervision on choosing private partner procedure and completion of PPP projects, such projects can become a dangerous tool for wasting national resources. In the study of Medda et al.,³⁸ it has been explained that high initiative costs of PPP projects showing the high budget is needed to cover financial risks, which should be considered in the form of incentives plan in PPP contracts. However, the judgment ultimately depends on whether a logical and effective assessment along with the allocating of risks to the private sector and whether this allocation is proper considering financial interest.

To solve deficits in public budgets, some participants proposed that NGOs must be utilized in those fields with high social acceptability such as holding campaigns and public education. There are relevant successful instances by using NGOs as the private party in PPP contracts.^{44,45} Since the shortage of private companies ready for partnership in Iran, and sometimes they were unable to meet the preconditions of the public sector, the use of NGOs can help to solve this challenge.^{46,47}

One of the main limitations of the study was limited number of experts and experienced people that may affect data saturation. Also, the participants were all from Iran and had more knowledge about Iran and its setting than other countries, which may limit the generalizability of the findings.

This study sought to determine whether PPP could be used as an option to reduce the burden of RTI in Iran. The results provide insight into the perception of different stakeholders of PPP applicability to prevent and decrease RTIs in the country. Despite experts' emphasis on the effectiveness of PPP application in prevention of RTI, there are many challenges that limit private sector partnership. Based on the results of this study, it seemed that this model could be an option, but it requires a lot of preliminary studies to provide the context and conditions for applying this policy.

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Ethical Statement

The study was approved by the Ethics Committees of the authors' Institute (Ethical Number: IR.TBZMED.REC.1397.683). Written informed consent was obtained from all participants before the interview.

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Declarations of Competing interest

The authors declare no conflicts of interest.

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