

## Preplanned Studies

## The Health Demands of Designated Drivers — Four Cities, China, 2019

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### Summary

#### What is already known about this topic?

The health status of designated drivers is largely associated with road safety, which is a major public health issue. However, few studies have focused on the health demands of designated drivers.

#### What is added by this report?

This study investigated the health consciousness, first aid knowledge learning, acceptable ways to acquire health knowledge, and willingness to have physical examinations for designated drivers to provide suggestions for improving their health status.

#### What are the implications for public health practice?

The industry and platform should provide scientific and reasonable guidance on healthy lifestyles for designated drivers and implement physical examinations to monitor their health status.

As an emerging profession, the number of hired designated drivers is growing quickly in China. Designated driver services play an important role in reducing driving under the influence and road traffic fatalities (1). This kind of job is characterized by mobility, long hours, and high pressure, and therefore, designated drivers face a great deal of occupational health risks. This study aimed to investigate the health demands of designated drivers and provided targeted suggestions for improving their health. The survey was conducted from July to August 2019 in Beijing and Tianjin municipalities as well as Hangzhou and Zunyi cities, in which an electronic questionnaire was administered to hired designated drivers who participated in physical examinations. A total of 327 designated drivers completed the questionnaire. The results showed that the percentage of drivers who had ever received a physical examination was low. The willingness of participants to have a medical examination decreased with an increase in the proportion of their own expenditure. Mobile phones, doctors/nurses, and TV/radio were the top three

sources of health information for designated drivers. This study suggested that the platforms serving designated drivers should provide scientific and reasonable guidance on healthy lifestyles through the app and organize physical examinations for designated drivers to monitor their health status.

This survey was carried out using an electronic questionnaire from July to August 2019. Participants were recruited from designated drivers who participated in physical examinations organized by a designated driver service platform in Beijing, Tianjin, Hangzhou, and Zunyi. A total of 390 designated drivers participated in the questionnaire survey, and a total of 327 questionnaires were collected with a response rate of 83.85%. Of those, 98 subjects were from Beijing, 71 from Tianjin, 87 from Hangzhou, and 71 from Zunyi. An online survey tool of “Wenjuanxing” was employed to make the questionnaires, collect data, and store data. The contents of the questionnaire included general information (age, gender, income, insurance, education level, and daily working time), health status (sleep time, sleep problems, chronic disease, and driving fatigue), health-related behaviors (smoking, drinking, exercise, and fruit/pork/vegetable intake), and health demands (willingness to learn about the health knowledge and to get physical examinations). All the participants provided informed consent.

SAS (version 9.4, SAS Institute, North Carolina, the United States) was used to conduct all analyses. Data of working years, daily working time, and self-pay ratio were not normally distributed; therefore, these variables were presented by median and interquartile range, and the statistical inference was calculated using the Wilcoxon rank-sum test. The categorical data were described by constituent ratio, and chi-squared tests or Fisher’s exact probability test were employed to examine the difference between the two groups. A *P*-value of <0.05 was considered to be statistically significant.

Among the 327 designated drivers, 268 participants

were full-time and 59 participants were part-time. A total of 82.87% of participants were under 45 years old, and 98.47% of them were male. The educational levels of designated drivers were ranged from less than or equal to junior high school to college, with a significant difference between full- and part-time drivers ( $P<0.05$ ). Overall, 32.72% of participants did not have any type of medical insurance. The median of working years was 2 years, with no difference between the two working types ( $P>0.05$ ). The median daily working time was 9 hours for full-time drivers and 7 hours for part-time drivers, with significant differences between the two ( $P<0.05$ ). Results are shown in Table 1.

Overall, 93.27% of participants actively learned about health information, with no difference between the 2 working types ( $P>0.05$ ); 66.67% of the participants had received physical examinations previously, 33.33% never received a physical examination, and the difference between the two working types was statistically significant ( $P<0.05$ ). Under the following payment conditions for physical examinations, including free of charge, partially funded, and fully self-pay, 99.39%, 79.51%, and 41.90% of designated drivers, respectively, were willing to have physical examinations. The median proportion

of willingness to pay was 45.5% for full-time drivers and 50% for part-time drivers, with no difference between the two ( $P>0.05$ ).

The percentage of learning first aid knowledge among the respondents was low, 40.98% of the drivers had not learned about it. As for the view of carrying simple emergency medical supplies when working, 74.62% of the participants thought that they should carry, 7.64% of them did not think so, and 17.74% of them did not care about it. There was no significant difference between full-time and part-time drivers in terms of having first aid knowledge and willingness on carrying emergency medical supplies ( $P>0.05$ ). The results are presented in Table 2.

Overall, 63.00%, 51.68%, and 47.09% of designated drivers obtained relevant health knowledge through mobile phones, doctors/nurses, and TV/radio, respectively. The other ways of accessing information were through newspapers/books, family, colleagues/friends, computers, etc. A total of 72.17% of participants agreed that mobile apps were the most acceptable way for participants to acquire health knowledge. With respect to health knowledge manuals and health knowledge lectures, the proportions of agreement were 13.15% and 13.15%. These numbers are illustrated in Figure 1 and Figure 2.

TABLE 1. Demographic and occupational characteristics of designated drivers by working types in China, 2019 [n (%)].

Variables	Full-time	Part-time	Total	P-value
Total	268	59	327	-
Age (years)				
<35	105 (39.18)	25 (42.37)	130 (39.75)	
35–45	112 (41.79)	29 (49.15)	141 (43.12)	0.144*
>45	51 (19.03)	5 (8.47)	56 (17.13)	
Gender				
Male	264 (98.51)	58 (98.31)	322 (98.47)	
Female	4 (1.49)	1 (1.69)	5 (1.53)	0.901†
Educational level				
Junior high school graduate	106 (39.55)	15 (25.42)	121 (37.00)	
Senior high school graduate	138 (51.49)	33 (55.93)	171 (52.30)	0.030*
College graduate	24 (8.96)	11 (18.64)	35 (10.70)	
Medical insurance				
Yes	177 (66.04)	43 (72.88)	220 (67.28)	
No	91 (33.96)	16 (27.12)	107 (32.72)	0.311
Working years	2.00 (1.00, 3.00) <sup>§</sup>	2.00 (1.00, 3.00) <sup>§</sup>	2.00 (1.00, 3.00) <sup>§</sup>	0.991
Daily working time (hours)	9.00 (8.00, 10.00) <sup>§</sup>	7.00 (5.00, 8.00) <sup>§</sup>	9.00 (8.00, 10.00) <sup>§</sup>	<0.001

\*  $\chi^2$  test;

† Fisher's exact probability test;

§ Median and inter quartile range.

TABLE 2. Health demand of designated drivers in China, 2019 [n (%)].

Variables	Full-time	Part-time	Total	P-value
Total	268	59	327	–
Do you learn about health information actively?				
Yes	251 (93.66)	54 (91.53)	305 (93.27)	0.567*
No	17 (6.34)	5 (8.47)	22 (6.73)	
Have you ever had a physical examination?				
Yes	172 (64.18)	46 (77.97)	218 (66.67)	0.042*
No	96 (35.82)	13 (22.03)	109 (33.33)	
Do you want to have a physical examination?				
Free, yes	267 (99.63)	58 (98.31)	325 (99.39)	0.358†
Free, no	1 (0.37)	1 (1.69)	2 (0.61)	
Partially self-pay, yes	214 (79.85)	46 (77.97)	260 (79.51)	0.884*
Partially self-pay, no	54 (20.15)	13 (22.03)	67 (20.49)	
Fully self-pay, yes	113 (42.16)	24 (40.68)	137 (41.90)	0.949*
Fully self-pay, no	155 (57.84)	35 (59.32)	190 (58.10)	
If you accept partially self-pay, what proportion are you willing to pay?	45.50 (20.00, 80.25) <sup>§</sup>	50.00 (20.00, 64.50) <sup>§</sup>	46.00 (20.00, 80.00) <sup>§</sup>	0.753
Have you ever learned first aid knowledge?				
Yes	159 (59.33)	34 (57.63)	193 (59.02)	0.810*
No	109 (40.67)	25 (42.37)	134 (40.98)	
Do you want to carry simple emergency medical supplies when working?				
Yes	203 (75.75)	41 (69.49)	244 (74.62)	0.586*
No	20 (7.46)	5 (8.47)	25 (7.64)	
I don't care	45 (16.79)	13 (22.03)	58 (17.74)	

\*  $\chi^2$  test;

† Fisher's exact probability test;

§ Median and inter quartile range.

## DISCUSSION

The results of this study showed that designated drivers had some health consciousness, while they had insufficient knowledge regarding first aid. Designated drivers work in a complex environment during nights, in which they face threats such as road traffic accidents and sudden illnesses. Learning first aid knowledge could help them to avoid risk factors in a reasonable and timely way, which may save their lives and others when necessary (2). The study found that designated drivers obtained health knowledge from a variety of sources, but could not identify the authority of the information due to the lack of professional health knowledge. Therefore, it is necessary to provide specific health knowledge for designated drivers in appropriate ways. The survey found that 72.17% of participants hope to receive relevant health knowledge through mobile apps. As designated drivers take orders through the mobile app platforms and their working

time and place are unfixed, designated driver service platforms could provide scientific guidance on healthy lifestyles through the mobile apps to enhance the health awareness of designated drivers.

The results indicated that the physical examination percentage of designated drivers was low and with the increase in the proportion of their own expenses, the willingness of the participants to have a medical examination decreased. The results were similar to the survey of the willingness of rural residents to have physical examinations (3). The possible reasons include not realizing the importance of regular physical examinations and worrying about the high cost of physical examinations. Given this, the designated driver platform can organize physical examinations for designated drivers to monitor their health status. Medical insurance plays an important role in reducing the economic burden of diseases. In this survey, 32.72% of respondents did not have medical insurance, implying that designated drivers face a

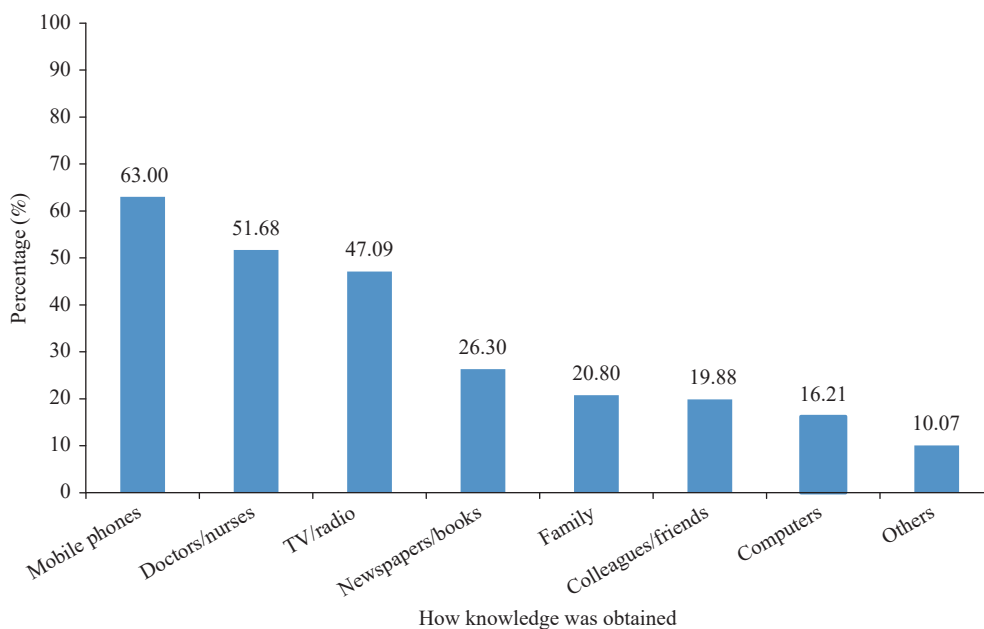


FIGURE 1. Ways for designated drivers to obtain health knowledge in China, 2019.  
Note: Participants could select multiple answers.

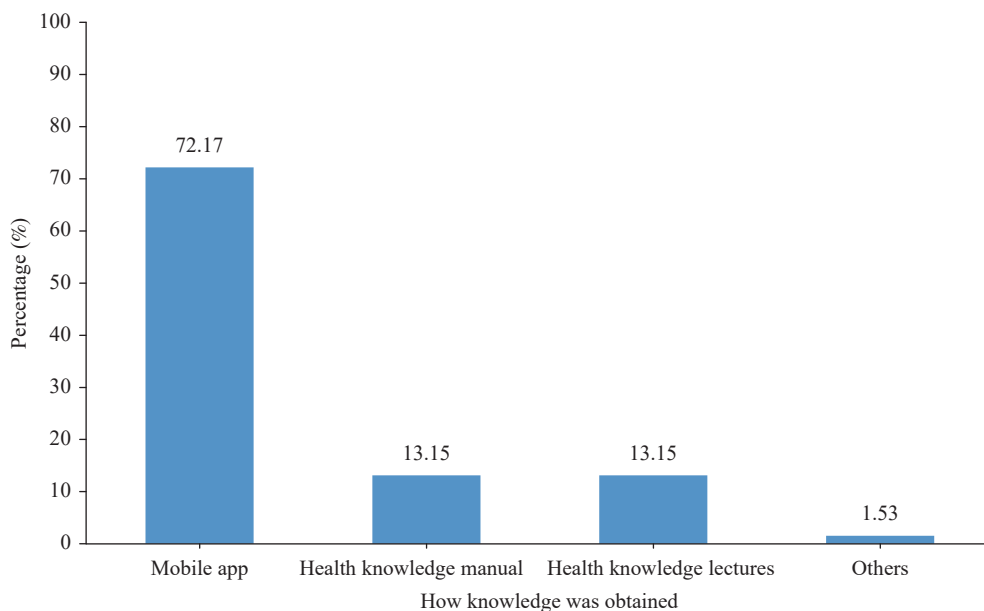


FIGURE 2. Acceptable ways for designated drivers to acquire health knowledge in China, 2019.  
Note: Participants could only select single answers.

higher burden of disease. The government and industry should pay more attention to the medical insurance participation of designated drivers, and the platform could provide economic support for designated drivers to buy medical insurance (4).

Previous studies on designated drivers mainly focused on the legal disputes and the role they played in reducing driving under the influence (5–8), and few studies focused on the health status and health

demands of designated drivers. This study investigated the health demand of the designated drivers to provide suggestions for improving their health status.

The study was subject to some limitations. Only the primary health needs of designated drivers were investigated and the sample size was relatively small due to limited funding and time. A purposive sampling method was used in the survey, which may have some bias on the outcome. In the following research, the

sample size and survey sites should be further expanded and other health demand of designated drivers should be taken into consideration as well.

In conclusion, the health awareness of designated drivers was insufficient. Moreover, the health status of designated drivers could aggravate the safety of driver, customer, and other passengers, and their safety and health demand should be highlighted. The industry and platform should plan health education programs for designated drivers to improve their health and road safety.

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