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Self- and peer-assessments of ambulance drivers' driving performance

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ABSTRACT

The aim of the present study was to develop and examine the quality of the Ambulance Driver Self-assessment Questionnaire (ADSQ) and the Ambulance Driver Peer-assessment Questionnaire (ADPQ) measuring aspects of, driving performance, driving style and driving competence. In addition the ADSQ measures self-reflection and safety-attitudes. The aim of the study was also to examine ambulance drivers' self- and peer-assessments as well as to examine the accuracy of self-assessments by comparing self-assessed and peer-assessed driving performance, driving style and competence. 76 ambulance drivers employed at two ambulance stations in northern Sweden completed ADSQ and ADPQ. Item analyses were conducted to examine the psychometric properties of the items, and based on the results some revisions were made to improve the questionnaires. The revised questionnaires were functioning rather well, although some subscale demonstrated low internal consistency. Subscale inter-correlations provided support for construct validity. Self- and peer-assessments indicated safe driving performance and good driver competence, which is positive from a traffic safety perspective. A comparison of mean self- and peer-assessment ratings, controlling for age, gender and driving experience showed no significant differences, except for the subscale overtaking. This indicates that ambulance drivers' self-assessments are realistic in most areas.

1. Introduction

The ability to accurately assess one's own driving competence and driving behavior may be expected to have relevance for the driving performance, because safe driving requires that the driver can adapt his or her behavior to the demands of the driving task [1]. For example, a driver who is aware of the limitations of his or her driving skills on slippery road conditions may be able to take this into consideration and adapt the driving accordingly [2]. On the other hand, inaccurate self-assessments might result in that drivers engage in driving tasks that are too demanding and unsafe [1]. Many studies have examined drivers' self-assessments of competence and driving skill, and several attempts have been made to develop rating scales and questionnaires to measure these constructs [3]. Most of these scales focus on aspects of driving performance and driver competence that pertain to the general population of drivers. Little attention has been brought to self-assessments of professional drivers [4,5]. Although the general aspects of driving performance are relevant for these groups, there are additional aspects of driving performance and competence that are relevant for the safety of professional drivers, e.g. emergency drivers [4]. Emergency drivers are particularly at risk. In comparison to other vehicles, ambulances have an increased risk of collision involvement [6]. Compared to the general population, ambulance drivers are more than five times more likely to become a fatality in a crash [7].

The most common strategy for examining the accuracy of self-assessed driver competence has been by asking drivers to compare their own driving skills to that of the average driver. These studies have indicated that drivers are overconfident, as the majority believe that they are more skilled than the average driver [8–10]. However, this methodology is problematic because one cannot determine whether the drivers are overconfident or not as information about their actual competence is missing [11]. Thus, in order to obtain reliable information about the accuracy of driver competence, there is a need to compare self-assessed competence with external measures of competence. Studies that have applied this strategy indicate that the proportion of drivers who make accurate assessments of their own skills are larger than what has been indicated from studies focusing on comparison with the average driver [12,13].

Research indicates that the accuracy of self-assessment can be developed through education, for example by practicing self-assessment and obtaining feedback on self-assessment and performance [14]. Self-assessment skills, such as meta-cognitive skills and reflective thinking have been shown to be essential characteristics of an expert, and these skills play an important part in the development of expertise. An accurate assessment of one's own driving performance and competence can be expected to be important for traffic safety, not only for the general population of drivers, but for other groups as well. Thus,

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training of self-assessment skills is important both for novice drivers and for professional drivers, such as ambulance drivers. It is important to include training of self-assessment skills in the training of ambulance drivers, because these skills do not develop automatically [15].

The training of ambulance drivers in Sweden has commonly been focusing on improving maneuvering skills, such as vehicle handling skills at high speeds. There is however little evidence that this kind of training has any effect on reducing the accident risk [16]. Previous studies suggest that training focusing on risk perception and hazard awareness [4] as well as anticipatory skills rather than maneuvering skills in slippery driving conditions is preferable, because skill-focused training tends to result in overestimation of one's own skills [17,18]. Thus, the driver training should make drivers aware that they cannot rely on their skills to handle a critical situation in traffic. The aim of such training is to improve the accuracy of drivers' self-assessment and to encourage them to drive with larger safety margins. Research indicates that insight training has positive effects on safety margins, distance to other vehicles and tendency to overtake [19] and results in a safer driving style [20]. Self-assessment of one's own driving competence and driving style is an essential aspect of insight training.

In order to examine ambulance drivers' self-assessment of driving performance and competence, and to examine the accuracy of their self-assessments, reliable and valid instruments are needed. Such instruments could be used to examine levels of self-assessments generally, but could also be used to examine the effect of driver education on self-assessments. Based on this, there is a need to develop and evaluate self-report instruments for driving performance and competence among ambulance drivers.

1.1. Purpose

The purpose of the present study was three-fold. First, to develop questionnaires measuring ambulance drivers' self-assessed driving performance, driving competence, driving style, self-reflection and safety-attitudes as well as peer-assessed driving performance, driving competence and driving style and to examine the psychometric properties of the items and subscales in these questionnaires. Second, the purpose was to examine ambulance drivers' self-assessed and peer-assessed driving performance and driving competence. Third, the purpose was to examine the accuracy of the self-assessments.

2. Method

2.1. Participants and procedure

Seventy-eight ambulance drivers employed at two ambulance stations in Northern Sweden were invited to participate in the study. Of these, 76 decided to participate. The participants were between 26 and 62 years of age (M = 42.82, SD = 9.89) and 83% were male. Most of the participants had long emergency driving experience. About 25% had 1–6 years of experience, 25% had between 7 and 14 years of experience, 25% had between 15 and 23 years of experience, and the last 25% had between 24 and 37 years of experience.

The participants received a letter containing information about the study and were asked to complete a self-assessment and peer-assessment questionnaire online. They were informed that participation was voluntary. They started by filling out the self-assessment, and then they were asked to make a peer-assessment of three of their colleagues by filling out the peer-assessment questionnaire. The peer-assessment was a blind procedure: the ambulance drivers did not know whom they were assessed by.

2.2. Questionnaire development

The questionnaires developed in this study were labeled the Ambulance Driver Self-assessment Questionnaire (ADSQ) and the Ambulance Driver Peer-assessment Questionnaire (ADPQ). The rationale for developing the questionnaires was to use them for evaluating the effects of an insight-training course for ambulance drivers. The goals of the course were to improve ambulance drivers' judgment, risk awareness and self-reflection on their emergency driving. Therefore, the goals of the insight-training course were used as a basis when developing the questionnaires. The goals of the insight-training course cover competences important for safe driving and were based on analyses of circumstances around ambulance crashes [21], the Swedish Road Administration's guidelines for training of ambulance drivers [22], focus-group interviews with ambulance drivers concerning characteristics of a safe driver [23], and the regulations regarding risk education for category B [24]. In addition to the goals of the course, the construction of the questionnaires was also guided by existing instruments measuring other aspects of driving skill and driving behavior in general (e.g. DBQ) and the driving behavior of ambulance drivers in particular [4].

In order to ensure that the questions were clear and understandable to the respondents, the questions and response alternatives were tested in a cognitive interview [25] with one ambulance driver. In this interview, the driver was asked to complete the questionnaire, and the answers were probed for more information to indicate whether the person did understand the question as intended. As a result of this interview, some revisions were made. As a final step, the questions were reviewed by five experts in test construction, and revisions were made in order to further improve the questions.

The self-assessment questionnaire included some background questions about driving experience and accident record, items about *driving performance*, *driving style out on a call and back to the hospital* (see Table 1), *perceived driving competence* (see Table 2), *self-reflection* (see Table 3), *whether drivers rely on other road users* (see Table 4), as well as some items about *safety attitudes* (see Table 4). In total, 24 items were included in the questionnaire (see Fig. 1). The wording of the self-assessment items is presented in Tables 1 to 4.

There are studies that indicate that a relatively large proportion of drivers overestimate their driving competence when compared to driver examiners' assessment of competence [12,13]. In order to obtain an external measure of ambulance drivers' driving performance and driving competence, the peer-assessment questionnaire was developed. Both self-assessment and peer-assessment were used to evaluate the effects of the insight-training course and self-assessment was compared to peer-assessment in order to evaluate the accuracy of self-assessments [26]. The items in the peer-assessment corresponded to the items in the self-assessment questionnaire, tapping the colleague's driving performance as well as driving competence (see Fig. 1). In addition, the peer-assessment also included a question where drivers were asked how confident they were in their assessment of their colleague. This item was included to obtain an estimate of the reliability of peer-assessments. The wording of the peer-assessment items is presented in Table 6.

Because the questionnaires cover aspects important for safe driving, they could be valuable not only for evaluating the effects of the insight-training course, but for other purposes as well, given that they are reliable and valid. For example, they could be used for research purposes increasing the understanding of ambulance drivers' self-assessments, and the relationship between self-assessed driving competence, driving skills and self-reflection as well as the relationship between self- and peer-assessment in general.

2.3. Statistical analyses

First, the quality of the items in the questionnaires was examined. The psychometric properties of the items and subscales were examined