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ORIGINAL ARTICLE

Expert consensus and perspectives on recovery following road traffic crashes: a Delphi study

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ABSTRACT

Purpose: To reach expert consensus on a definition for recovery following minor and moderate road traffic crash-related injuries and key factors that influence recovery, and to explore expert perspectives on risk identification methods.

Materials and methods: A three-round Delphi study was conducted in which 47 experts (insurance representatives, health care professionals and researchers) were consulted.

Results: Strong expert agreement (86%) was reached for the definition: "*Recovery is multifaceted and includes return to activities of daily living (ADLs), work and social/leisure activities at pre-injury level or at a level deemed acceptable by the individual, with minimal ongoing pain and symptoms, considering physical and mental health and wellbeing*". Agreed key factors that influenced recovery included: resilience; coping skills; recovery expectations; pre-existing physical and mental health; workplace support; and, collaboration between the injured individual, treating providers and claim handlers. Expert perspectives on risk identification methods were mixed.

Conclusions: An accepted definition for recovery following minor and moderate road traffic crash-related injury was established, which could facilitate communication and engagement between different rehabilitation stakeholders. Strong consensus was achieved on nine key factors that influenced recovery. Further research is needed to evaluate whether injured persons agree with this definition and on the utility of risk identification methods.

➤ IMPLICATIONS FOR REHABILITATION

- Expert consensus was established for a definition of recovery following minor and moderate road traffic crash-related injuries and nine key influencing factors.
- An established definition could facilitate communication and engagement between all rehabilitation stakeholders, which could improve the recovery process of the injured person.
- Rehabilitation professionals need to be familiar with the role of psychosocial factors, such as recovery expectations, resilience and coping skills, in the recovery process.
- The use of physical and psychological outcome measures at regular intervals could help to identify risk of poor recovery following minor and moderate road traffic crash-related injuries.

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Road traffic crash; injury; recovery; Delphi; expert consensus

Introduction

A high percentage (>85%) of road traffic crash (RTC) related injuries are classified as minor or moderate [1,2]. Despite this classification, these injuries often lead to chronic problems, such as persistent pain or concentration issues [3]. Identification of those who are at higher risk of long-term problems could help to guide the rehabilitation process, leading to better recovery outcomes for the injured person. Factors associated with poor recovery outcomes after minor RTC-related injuries have been studied extensively as shown by a recent systematic review which included 37 studies on this topic [2]. This systematic review highlighted that the research to date has been highly heterogeneous with regard to a definition for recovery [2,4], the assessed risk factors, timelines, populations and outcome measures [2,5,6]. Consequently, pooling the results of previous studies to determine which factors are most important to consider in the rehabilitation process was not possible [2,5,6].

In general, recovery refers to the process of returning to health after being injured [7]. Currently, there is no standardized definition for recovery following RTCs [2,4]. In most developed countries, people injured in RTCs can claim compensation. Regulatory authorities often define "recovery" according to the status of the compensable injury, which may be considered recovered when

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Supplemental data for this article can be accessed here.

return to work is achieved, when a doctor has determined that the impact of the injury has stabilised or when a claim is settled [8,9]. In comparison, previous scientific literature has reported that indicators of recovery following RTCs include severity of pain, quality of life, work status, mental health status, and degree of disability [2,5,6]. Definitions of recovery used in compensation or research may also differ from those used by health providers and the injured person themselves. Future research and rehabilitation practice could be improved with a universal definition of recovery after RTC-related injury. For example, a definition for recovery could be used in conjunction with an existing framework, such as the International Classification of Functioning, Disability, and Health of the World Health Organization (WHO ICF) [10], to better guide treatment plans. Additionally, rehabilitation interventions advance over time with the potential for improved recovery and therefore definitions of recovery and other concepts may need to evolve with our understanding. For instance, the pain community recently performed an expert-lead study and came up with a revised definition on pain [11].

Unsurprisingly, factors identified as predictors of poor recovery (e.g., high initial pain intensity and pain catastrophizing) in the literature differ depending on the chosen recovery outcome [2,5,6,12]. A better understanding of the most important factors that influence recovery after RTCs could help to develop and improve tools or methods to identify those at risk of poor recovery following these injuries. Identifying risk of poor recovery is important to ensure that appropriate resources are provided to those most in need. For the whiplash population, a clinical prediction rule is available to predict chronic moderate/severe disability and full recovery following a whiplash injury [13]. For insurers with responsibility for approving rehabilitation funding after RTC-related injuries, it is often a challenge to identify those at greater risk of poorer outcomes. Therefore, our group has recently developed an industry-specific screening tool to identify risk of poor recovery following minor and moderate RTC-related injuries [14]. This brief tool (eight items) was created based on a cohort of RTC claimants with minor and moderate injuries in Queensland, Australia, and was able to correctly identify 90% of those at risk of poor physical and 80% of those at risk of poor mental health recovery. The tool needs to be validated in an independent cohort and requires confirmation of acceptability by potential users. Other more general screening tools are also available, such as the Örebro Musculoskeletal Pain Questionnaire (ÖMPQ) [15] and the STarTback [16], but these tools may not be suitable for the RTC population. Despite the existence of these tools, no studies to date have investigated clinician need for such screening tools (or similar resources) to identify risk of poor recovery in this population.

The lack of consensus regarding what constitutes recovery and what are the most important factors that influence recovery following minor and moderate injuries sustained in RTCs, highlights the need to engage experts in a collaborative process to reach agreement on a definition for recovery and its most influential factors. In addition, it is important to investigate the need for screening tools or other resources to identify risk of poor recovery following RTCs, by asking the potential end-users of such tools. Thus, this study aims to (1) reach expert consensus on a definition for recovery following minor and moderate injuries sustained in RTCs, (2) reach expert consensus on factors that influence recovery, and (3) explore the current use of, need for, and content of tools, methods, and other resources to help identify individuals at risk of poor recovery.

Methods

A Delphi study consisting of three rounds was conducted. The Delphi methodology is a widely adopted method for collecting and analysing knowledge from a group of experts [17]. The Delphi surveys were administered electronically using The University of Queensland (UQ) centrally supported online survey tool (Checkbox Survey Inc., USA). In each round, experts had the opportunity to clarify their responses and to give feedback using open-ended comments. Based on previous studies on this topic [12,14,18–20], this study was focused on minor and moderate injury, which include non-life threatening injuries such as soft tissue injury (sprain, strain), whiplash, contusion, closed fractures and laceration.

Expert panel

Individuals ($n = 47$) with expertise in the field of rehabilitation and recovery following RTC-related injuries participated in this study. The expert panel consisted of health care providers (e.g., physiotherapists, occupational therapists, psychologists, social workers, and nurses), insurance representatives (e.g., injury managers) and researchers. Experts were recruited *via* purposive sampling through the network of the research team, professional networks of providers, Compulsory Third Party (CTP) insurance companies, the Motor Accident Insurance Commission (MAIC – the regulatory authority responsible for the ongoing management of the CTP Scheme in Queensland, Australia), and through the scientific literature. Health care providers were eligible if they had at least two years' experience treating individuals injured in RTCs. Insurance representatives were eligible if they had at least two years' experience in managing claims of people injured in RTCs and if they were employed by a CTP insurer. Insurance representatives in Australia usually undertake a case management role and may be known as case (or injury) managers. Their role includes determining the need and approving funding for appropriate rehabilitation services [8,21]. Many insurer representatives have a background in health. Researchers were included if they had at least one peer-reviewed journal publication on health outcomes following minor and moderate RTC-related injuries.

Ethical considerations

Participants provided informed consent electronically before participation in the first survey and the study was approved by the Human Research Ethics Committee of The University of Queensland, Australia (approval number 2018001380). Participants were not reimbursed for their participation but they were informed that participation would give them the opportunity to influence content and the form of future resources to ensure these resources are valuable for clinical practice. The voluntary nature of the study was specified in the information sheet and consent form and participants were informed that they could withdraw from the study at any time with no consequence. There was a small risk related to maintaining confidentiality of participants, as their names may be identified in the acknowledgement section of publications. However, participants had the opportunity to opt out and stay anonymous. Individual participant's opinions were not identifiable to other participants or in any publications or presentations.

Procedure

The first round consisted of the following open-ended questions:

1. What do you believe constitutes recovery following minor and moderate injuries (e.g., whiplash, closed arm fracture, soft tissue laceration) sustained in a road traffic crash?
2. What factors (positive and negative) do you believe most influence recovery following minor and moderate injuries sustained in a road traffic crash?
3. In your practice or research, do you currently use tools or methods (including questionnaires) to identify individuals who are at risk of poor recovery following minor and moderate injuries sustained in a road traffic crash? If yes, which tools or methods do you use?
4. What additional resources (e.g., tools/knowledge/skills) do you think could be useful to assist in identifying individuals who are at risk of poor recovery following minor and moderate injuries sustained in a road traffic crash?

The data was first de-identified and analysed by the lead researcher (ES) after which the second reviewer (VJ) analysed anonymized data. Answers to questions one and two were summarized and combined into a list of definitions for recovery and a list of positive and negative factors. The answers to question three were summarized and described. The answers to question four were classified as either education/training resources or tool/material resources (forming two lists of resources). The resources were also grouped into a list of seven broad strategies. The lists with anonymized data were reviewed by all members of the research team and the lists with factors that influence recovery were supplemented, if necessary, with factors reported in a systematic review [2].

In the second round, the lists were provided to the expert panel, who were asked to: (i) select the definition they believed best defines recovery; (ii) rate how influential each factor was on a 5-point Likert scale (1 = Not at all influential; 2 = Slightly influential; 3 = Somewhat influential; 4 = Very influential and 5 = Extremely influential); (iii) select a top five of education/training resources; (iv) select a top five of tool/material resources; and (v) rank the strategies in order of priority. In addition, this round was used to explore experts' perspectives on the characteristics of a screening tool to identify risk of poor recovery. Experts were asked what should be the maximum number of items (5, 10 or 15) and the maximum duration (5, 10, 15 or 20 min) of a screening tool, who (health professional, injured person, insurance representative or a combination) should administer it and what would be the preferred outcome (level of risk, guidance to treatment or referral to a specialist).

A third round was used to present a refined definition of recovery, which was created by combining the elements of the options selected by a majority of the experts in round two. The experts were asked how much they agreed with this definition on a 5-point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree). If they disagreed (a rating of 1 or 2) they were asked to briefly describe the reason. Experts were also presented with our recently developed industry-specific screening tool [14] and asked how likely it would be that they would use the tool in their practice on a 5-point Likert scale (1 = Extremely unlikely; 2 = Unlikely; 3 = Neutral; 4 = Likely; 5 = Extremely likely, with the additional option: "did not have time to have a look at the tool"). If they selected a rating of 1 or 2, they were asked to briefly describe the reason.

Data analysis

Consensus regarding a definition for recovery and factors that influence recovery was accepted when 70% of the experts agreed. The definition was accepted when 70% of the experts selected the same definition in the second round or if at least 70% of the experts agreed (a rating of 4 or 5) with the definition presented in the third round. For each factor listed in the second round, the median rating was calculated. Each factor with a median value of at least 4.5 was selected if at least 70% of the experts agreed that the factor was very or extremely influential (rating of 4 or 5) [17]. For the strategies and resources to identify risk of poor recovery, the importance ratings were explored by calculating the median scores and the percentage of experts who agreed on either a high or low importance rating.

Results

Expert panel

The initial invitation to participate was sent to 81 individuals. In addition, MAIC sent a general invitation email to the managers of four CTP insurance companies to be distributed to their employees. A total of 47 experts participated in and completed the first round, 40 participated in the second round, and 42 experts participated in the third round. Of the 40 participants in the second round, two experts only answered the first question regarding a definition for recovery and one expert completed half of the survey. In the third round, one expert (of the 42) completed half of the survey. All available data, including data from experts that did not complete the full survey, were analysed. On average, experts had 17 years (SD = 10) of experience in the field of RTC-related injury, with 43% of the experts having over 20 years of experience. Most experts were based in Australia (85%) with a few based in Europe (9%) and Canada (6%). Different professions involved in recovery following RTC-related injury were represented across the three rounds: approximately 26% were insurance representatives, 43% were health professionals and 31% were researchers. A quarter of the insurance representatives were also currently practicing as a health professional, and approximately half of the health professionals were also researchers. Most of the expert panellist had a physiotherapy (30%; $n = 14$) or psychology (21%, $n = 10$) background, others were occupational therapy (15%; $n = 7$), epidemiology (11%; $n = 5$), case/injury management (11%; $n = 5$), medical (9%; $n = 9$) and nursing (4%; $n = 2$).

Definition of recovery

The responses to Round 1 resulted in nine definitions of recovery following minor and moderate RTC-related injuries (Table 1). After Round 2, three definitions combined were selected by 68% ($n = 27$) of the experts ($n = 40$). These definitions, together with the free text comments were used to create one modified definition, which was presented to the experts in Round 3. This definition was: "*Recovery is multifaceted and includes return to activities of daily living (ADLs), work and social/leisure activities at pre-injury or at a level deemed acceptable by the individual, with minimal ongoing pain and symptoms considering physical and mental health wellbeing.*" In this definition, activities of daily living (ADLs) include both personal activities of daily living (e.g., bathing and dressing) as well as instrumental activities of daily living (i.e., more complex tasks, such as shopping and driving). Consensus was reached with 86% of the experts ($n = 36$) agreeing with the definition. All ($n = 10$; 100%) insurance representatives agreed with the definition, 95% of the health professionals ($n = 18$), and 62% of the researchers ($n = 13$). Twenty-three experts provided additional feedback. The most frequent comment was about the use of the word "minimal". It was suggested by some experts that this term may not need to be included as the magnitude of "minimal" can

Table 1. Definitions of recovery following minor and moderate injuries following a road traffic crash and how often each definition was selected by the experts.

	Definition	How often selected (*n* (%))[a]
Definition 1	Recovery is multifaceted and includes return to ADLs, work and social/leisure activities with minimal ongoing pain and symptoms, where both physical and mental health are similar to pre-injury	15 (38%)
Definition 2	Recovery is complex and does not have a uniform meaning for individuals, it is important to establish what "recovery" means to the individual	7 (18%)
Definition 3	Recovery can be defined as return to pre-injury functional status with the ability and confidence to manage ongoing pain and symptoms	5 (13%)
Definition 4	Recovery is when the injured individual self-reports they are recovered	4 (10%)
Definition 5	Recovery can be defined as return to pre-injury functional status without ongoing medication or treatment	3 (8%)
Definition 6	Recovery can be defined as return to life roles relevant to the individual with minimal impediment	3 (8%)
Definition 7	Recovery is when the injured individual is satisfied with their current state of being	3 (8%)
Definition 8	Recovery is when the individual is able to return to ADLs, work and social/leisure activities with no or minimal ongoing pain and symptoms	2 (5%)
Definition 9	Recovery is when the individual is able to return to ADLs, work and social and leisure activities	1 (3%)

ADLs: Activities of Daily Living. [a]*n* = number of votes; % = percentage of experts selecting the definition; all percentages add up to >100% as some experts selected multiple definitions.

Table 2. Expert agreement and median rating for factors that influence recovery following minor and moderate road traffic crash-related injuries.

Category[a]	Factors that experts believe have an influence on recovery	% Expert agreement[b]	Median rating[c]
General Health (−)	Pre-existing psychosocial problems	97	5.0
Insurance (−)	Focus on claim and compensation instead of recovery	97	5.0
Workplace (−)	Lack of support in the workplace	97	5.0
Psychosocial (+)	Having positive expectations and beliefs towards recovery	97	5.0
Psychosocial (−)	Poor recovery expectations	95	5.0
Psychosocial (−)	Negative thoughts	95	5.0
Psychosocial (+)	High resilience	95	5.0
Psychosocial (+)	Effective coping skills	95	5.0
Workplace (+)	Supportive work environment	95	4.5
Psychosocial (−)	Low self-efficacy	95	4.5
Psychosocial (−)	Catastrophic beliefs	92	5.0
Healthcare (−)	Lack of collaborative approach between injured individual, treating providers and claim handlers	92	5.0

[a]Factors that have negative influence are indicated with (−) and positive influence with (+).
[b]Percentage of experts who selected a rating of a 4 (very influential) or 5 (extremely influential).
[c]Median rating based on rating of all experts (on a scale from 1 to 5; 1 = Not at all influential; 2 = Slightly influential; 3 = Somewhat influential; 4 and 5 see [b]).

be difficult to define, and some individuals may consider themselves recovered even with more than minimal pain.

Factors that influence recovery

Round 1 resulted in one list with 47 factors that positively influence recovery and another with 60 factors that negatively influence recovery, which were presented to the experts in Round 2. Consensus was reached (i.e., 70% of the experts rated the factors with a 4 or 5, and median value is at least 4.5) for 15 positive factors and 14 negative factors (see Supplementary file 1). Strong expert agreement (>90%) was reached for four positive factors and eight negative factors (see Table 2). For all socio-demographic and injury-related factors (positive and negative) no consensus was reached.

Resources to identify risk of poor recovery

In Round 1, experts identified many (> 40) additional resources that they perceived would be useful to assist in identifying individuals who are at risk of poor recovery. For round 2, the research team summarised these resources into 16 education/training resources, 19 tool/material resources (Table 3) and seven general strategies (Table 4) to assist in identifying risk of poor recovery. For both the education/training resources and the tool/material resources, experts were asked to select their top five (see Table 3). One education/training resource was selected for the top five by 70% of the experts, this was "*Training for clinicians to become aware of and how to deal with important psychosocial factors*". The remaining education or training resources demonstrated only 8-43% agreement among the experts. The highest rated tool-based resource was "*Use of outcome measures at regular intervals targeting physical and psychological recovery*" which was selected for the top five by 68% of the experts. The remaining tool/material resources demonstrated 0-59% agreement among the experts.

The experts ranked the seven general strategies in order of priority and the results showed that tools to identify risk designed for use by primary care practitioners received the most "high priority" ratings, with 49% (*n* = 18) of the experts rating it as high or very high priority (Table 4). This strategy also received the least amount of "low priority" ratings, with 8% (*n* = 3) of the experts rating it as low or very low priority. Tools specific for the RTC population received the highest amount of "low priority" ratings, with 43% (*n* = 16) of the experts rating it as low or very low priority. This strategy was also rated as high or very high priority by 24% of the experts (*n* = 9).

Current tool use and preferences

In the first round, 70% (*n* = 33) of the experts indicated that they use tools/resources to identify risk of poor recovery. Half (*n* = 6) of the insurance representatives, 80% (*n* = 16) of the health professionals and 73% (*n* = 11) of the researchers indicated that they use tools for risk identification. The most frequently mentioned tools were the Örebro Musculoskeletal Pain Questionnaire (ÖMPQ), the Depression Anxiety Stress Scale (DASS) and the Neck Disability Index (NDI).

Results of the second round showed that most experts thought a potential new screening tool should have a maximum

Table 3. Additional education/training resources and tool/material resources that could help to identify risk of poor recovery following minor and moderate injuries sustained in a road traffic crash and how often they were selected in the top 5 by the experts.

	How often selected for TOP 5	
	n	%
Education / Training resources		
Training for clinicians to become aware of and how to deal with important psychosocial factors	26	70%
Educational resources for clinicians dealing with road traffic crash injuries ensuring that the existing clinical framework for health care delivery is being used optimally	16	43%
Education for health professionals regarding when to refer to other specialisms (e.g., psychologist, multidisciplinary programs)	15	41%
Training to deliver pain and behavioural education embedded in conversations with injured individuals	15	41%
Education for the injured person and family to shift community views and expectations	14	38%
Educational resources for clinicians dealing with road traffic crash injuries ensuring that proper communication channels are established between primary stakeholders	12	32%
Educational resources for clinicians dealing with road traffic crash injuries to empower healthcare professionals to take the initiative in maintaining proper communication between primary stakeholders	12	32%
Education in pain management	12	32%
Guidelines for the case manager	11	30%
Information brochures for the injured person	9	24%
Education for the injured person and family about common medical terminology, assessment and treatment methods	9	24%
Training and skills in motivational interviewing	8	22%
Training to become confident with critical conversations	8	22%
An injury or rehabilitation hotline where injured people can call allied health professionals to get hints and tips on recovery	8	22%
Education for community-based private practice clinicians	7	19%
In-person training & training materials around reading human behaviour and communication	3	8%
Tool / Material resources		
Use of outcome measures at regular intervals targeting physical and psychological recovery	25	68%
An easy to administer (e.g., checklist with numerical values) and quick tool with a range of personal factors to identify risk of poor recovery	22	59%
Assessment of beliefs and expectations of pain and recovery	21	57%
Tools to assess risk designed for use by primary care practitioners	20	54%
Standardised early intervention protocols	19	51%
A tool that not only covers main biopsychosocial factors but also specific patients' needs	18	49%
A fully validated 'gold standard' tool for evaluation of health outcomes following RTC	14	38%
Tools to predict recovery designed for use by insurance case managers	12	32%
A risk assessment tool designed specifically for clients injured in RTCs	12	32%
Assessment of work ability (e.g., work ability index + functional capacity evaluation)	8	22%
A tool to assess procedural justice and social impact	3	8%
Assessment of healthcare experiences	2	5%
A tool to assess cervical mobility	2	5%
Point-of-care diagnostics (bedside tests)	2	5%
Frailty scores	2	5%
Assessment of compensation experience when relevant	1	3%
A psychometric test to identify personality types	1	3%
Tools that measure workplace satisfaction	1	3%
A simple isometric neck strength test	0	0%

Table 4. Strategies to identify risk of poor recovery following minor and moderate injuries sustained in a road traffic crash and percentage of experts who selected the strategy as high or low priority.

Strategies	Median score[a]	% High priority[b]	% Low priority[b]
Tools to identify risk of poor recovery designed for use by primary care practitioners	5.0	49%	8%
Education / training for the health care professional	4.0	35%	27%
Tools to identify risk of poor outcomes	4.0	27%	30%
Education of the injured person	4.0	27%	30%
Tools to identify risk of poor recovery designed for use by insurance case managers	4.0	22%	35%
Education / training for the case/injury manager	3.0	16%	27%
Tools to identify risk of poor recovery specific for the road traffic crash population	3.0	24%	43%

[a]Strategies were ranked in order of priority and received a score from 7(highest priority) to 1 (lowest priority).
[b]High priority: scores of 6 and 7; Low priority: scores of 1 and 2.

of fifteen items and a maximum duration of ten minutes. For the question about who should administer a screening tool, half of the experts ($n = 19$; 51%) selected a health professional and 11 experts (30%) selected a combination or all (health professional, insurance representative and/or the injured person). The preferred outcome of a screening tool was to provide guidance to treatment (20 experts; 54%) or to identify level of risk (13 experts; 35%). Some experts gave additional feedback regarding this question and emphasized that a tool needs to influence treatment options, but that properties of a tool also depend on when in the recovery process the tool will be used.

In the third round, half of the experts ($n = 21$; 50%, 6 insurance representatives, 10 health professionals and 5 researchers) reported it would be likely or extremely likely (rated 4 or 5) that they would use our previously published screening tool [14] in their practice or research. The free text comments showed that these experts thought the tool was simple, clear and easy to use. Fourteen experts (33%; 1 insurance representative, 6 health

professionals; 7 researchers) reported it would be unlikely or extremely unlikely (rating of 1 or 2), with the main reasons being that the items of the tool were too general and that the tool needs validation. In addition, some feedback was provided on how the tool could be improved by, for example, adding a moderate or unclear risk category and providing treatment directions. The remaining experts ($n = 7$; 17%; 3 insurance representatives, 2 health professionals, 2 researchers) were "neutral" (rating of 3) about using the screening tool.

Discussion

Definition of recovery

The first aim of this study was to reach expert consensus on a definition for recovery following minor and moderate RTC-related injuries. Strong expert agreement was reached (86%) for the following definition: "*Recovery is multifaceted and includes return to ADLs, work and social/leisure activities at pre-injury level or at a level deemed acceptable by the individual, with minimal ongoing pain and symptoms, considering physical and mental health and wellbeing*".

The accepted definition highlights the multidimensional nature of recovery and the importance of accepting a new level of functioning where pain and/or symptoms persist. The definition fits within the model of the International Classification of Functioning, Disability and Health (ICF) of the World Health Organization (WHO)[10] as it includes components covering the three key domains: "body structure and function" (i.e., *minimal ongoing pain and symptoms*), and "activity limitations" and "participation" (i.e., *return to ADLs, work and social/leisure activities at pre-injury level or at a level deemed acceptable by the individual*). However, when looking at the relevant legislation where this research was conducted, the term "recovery" is not used in the context of health [22], only in the legal context of cost recovery. The guidelines for CTP rehabilitation providers in Queensland, Australia, only describe the process of rehabilitation and do not recommend any recovery-related outcomes [8]. The latter could be related to legal and societal expectations of CTP insurers to manage a claim. Complete "recovery" is not always possible and sometimes unachievable; and the pursuit of recovery could result in a significant financial impact on the insurance scheme. This may explain why a term like "recovery" is avoided in the context of injury, and language like "to restore/optimise, as far as reasonably possible, physical or mental functions and the quality of life" is used to guide the rehabilitation process. This language is in line with the general description of rehabilitation, i.e., "the process of making someone fit for work or to lead an ordinary life again" [7]. Our definition does include the possibility of change, i.e., *"at a level deemed acceptable by the individual"*, from a client perspective, which may not be appropriate for insurer guidelines. Despite the differences in language used by the various stakeholders and their guidelines, having an established definition of recovery could make communication and engagement between different stakeholders easier and improve the rehabilitation process for the injured person.

Interestingly, all insurance representatives and almost all health professionals agreed with our definition, whereas only 62% of the researchers agreed. This may be due to the differences in requirements of doing research and providing treatment [23]. With the scientific obligation to collect valid data and produce knowledge with appropriate rigour, researchers may be more critical about the contents of the definition and the language used [24,25]. Compared to the scientific literature our definition covers most of the "recovery" outcome measures that have been used previously, such as reduced pain [26–32], return to usual activities [33], return to work [30,33,34], and improved physical and mental health [35–37]. However, traditionally only one or two outcome measures are used in research and hence individual researchers may have a more narrow focus. To align with the perspectives of the health professional or case manager, future studies may need to consider the multifaceted nature of recovery which could provide a more holistic assessment and enhanced understanding of an individual's recovery status.

Furthermore, it was interesting to note that a timeframe for recovery was not included in the final definition. In round 1, only three of the 47 responses included comments on the timeframe (e.g., "timely return to function", "… in a timely manner", "… recovery to occur usually between 4-12 weeks"). A timeframe was therefore not included the definitions in round two. It was not mentioned again in the following rounds by the experts who participated in the study. The time perspective may have not been considered by the experts as it varies with type of injury and might therefore not be suitable for a general definition of recovery.

Factors that influence recovery

The second aim of the study was to reach expert consensus on key factors that influence recovery. Because of the heterogeneity of previous studies investigating predictors of poor recovery [2], it is still largely unknown on what factors both research and clinical practice should be focused. The Delphi methodology can be used to provide a more discrete set of factors that need further examination [38,39], but has not been used yet to determine the most important factors that influence recovery following RTC-related injuries. In the present study, the expert panel first identified many (>100) potential factors that they perceived influenced recovery following minor and moderate RTC-related injuries. An additional round reduced the number of items with strong agreement ($\geq$ 90%) to four positive and eight negative factors. This resulted in nine key factors, as two of the negative factors ("poor recovery expectations" and "negative thoughts") were the opposite of a positive factor ("having positive expectations and beliefs towards recovery"), and the positive and negative workplace factors were both related to the presence or absence of support in the workplace. The "workplace support" factor has previously been reported by insurance case managers in a qualitative study regarding recovery following RTCs [19], whereas it did not come up in the systematic review on recovery following minor RTC-related injury [2]. This literature review was not focused on return to work and, as such, questions regarding workplace support were often not included in the studies reported in the review. Literature regarding workplace injury does consider "workplace support" to be an important factor for recovery and return to work [40–42].

A number of factors that came up in our study were similar to previous research [2,6,19,20,43,44], such as "catastrophic beliefs", "poor recovery expectations/negative thoughts", and factors related to pre-injury physical and mental health status. The remaining factors that had strong agreement were: "high resilience"; "effective coping skills"; "low self-efficacy"; "focus on claim and compensation instead of recovery"; "pre-existing psychosocial problems"; "lack of collaborative approach between injured individual, treating providers and claim handlers". These factors were consistent with a previous study that investigated insurance case manager's perspective on predicting recovery following RTCs [19].

Further, results of the current study and previous qualitative studies with injured individuals emphasize the impact of psychosocial factors, such as (poor) recovery expectations and negative thoughts; and factors related to the healthcare system, such as lack of information and communication between the injured individual, healthcare providers and claim handlers [20,43–46].

None of the pain-related, socio-demographic and injury-related factors were identified by a majority of the experts, although many of these factors (high levels of post-injury pain, higher age, female gender, more severe injuries, lower limb injuries) have been previously reported as important predictors of poor recovery following RTC-related injuries [2,5,6,12,20]. This could suggest that the experts only considered modifiable factors even though they were not specifically asked to do this. However, the invitation to participate did explain that this study could help to improve the recovery process, which may have resulted in a focus on modifiable factors.

Identifying risk of poor recovery

The third aim of the study was to explore expert perspectives on tools, methods, and other resources to help identify individuals at risk of poor recovery. To our knowledge, only one previous study used a qualitative method to evaluate stakeholder perspectives on predicting poor recovery following road traffic crashes [19]. This study only involved insurance case managers and was focused on predictive factors rather than tools or methods to identify risk of poor recovery [19]. Our study did involve multiple stakeholders and shows their perspective on risk identification, which could help to improve resources and resource use in (clinical) practice. Overall, the results regarding risk identification (Tables 3 and 4) show the diversity of expert perspectives which highlights the complexity of this topic. The expert panel agreed that training for clinicians to become aware of and how to deal with important psychosocial factors was an important resource in risk identification. However, this resource involves more than just risk identification and suggests it may be as important for clinicians to be trained in ways to adapt their treatment based on risk scores that are informed by psychosocial needs. Future studies could therefore focus on linking risk of poor recovery with specific interventions or treatments. This was also emphasized by the responses of the experts to the question about the preferred outcome of a screening tool (guidance to treatment). Previous research regarding risk identification following injury supports the recommendation that linking risk scores to treatment or intervention is an important next step [14,47–49]. For whiplash and musculoskeletal pain, evidence based treatment options are available and include active treatments, such as advice to stay active and exercises (e.g., neck exercises for whiplash) [50,51]. Risk scores could be used, for example, to decide the best treatment option(s) or model of care and to guide the number of sessions.

Our results show that the most important strategy that could assist in risk identification is "*tools to identify risk of poor recovery designed for use by primary care practitioners*". However, even though it received the most "high priority" ratings compared to the other strategies, it was only selected by 49% of the experts. Ratings within each subgroup of experts were also mixed and did not show a clear pattern. Differences between experts may reflect the values of the professions, i.e., researchers intend to produce general knowledge to benefit the patient population, whereas health professionals and insurance representatives value helping the injured individual by identifying and understanding their specific needs [23]. Moreover, the differences between all experts emphasize the need for a collaboration between all stakeholders to produce valuable research outcomes that could be translated to clinical practice.

Although many additional resources to assist in risk identification were suggested, the experts also already use several tools. The health professionals nominated tools such as the ÖMPQ and the NDI, whereas the insurance representatives mentioned interviewing techniques and observations when speaking with the injured person. In their practices, the health professionals treat more than just RTC-related injuries, which may explain the use of a generic multidimensional tool such as the ÖMPQ. In contrast, the insurance representatives in this study only manage RTC-related cases and may be using other methods because no specific validated tool for the RTC-population is currently available. Recently, Nguyen *et al.* (2019) were successful in using the ÖMPQ-short form to identify risk of non-recovery following musculoskeletal injury sustained in RTCs [52]. In addition, our group has published the development of a screening tool based on a cohort of RTC claimants with minor and moderate injuries [14]. The study presents a brief (eight items) tool to help injury managers identify individuals at risk of poor physical and/or mental health recovery. This Delphi study was partly used to explore the acceptability of the tool by potential users. Several experts reported that they liked the tool because it was simple, brief and easy to use. Nevertheless, one third of all experts reported it would be unlikely that they would use the tool in their practice or research. Some experts questioned whether the tool would provide enough information and how their treatment decisions should change based on the result of the tool. The free text comments in this round provided interesting insights into how the tool could be improved (e.g., by adding a moderate or unclear risk category) and that it is important to consider when the tool will be used (e.g., in the emergency room or later in the recovery process). This will be taken into account in our future work regarding the tool.

Strengths and limitations

One of the strengths of this study is the use of the Delphi methodology, which is designed to facilitate decision making by transforming expert opinion into group consensus [17]. This methodology has not been used previously to study recovery following RTC-related injuries and could be advantageous as previous findings from the literature on this topic were inconclusive [2,5]. This methodology permits the inclusion of experts from various backgrounds and professions, which is essential as different key stakeholders (e.g., insurance representatives and health professionals) are involved in managing and treating RTC-related injuries. However, the Delphi methodology, as applied in our study, did not allow conversations between experts regarding their responses, which may have influenced the lack of consensus on some items. Instead, the methodology did have the advantage of providing anonymity to the respondents and a controlled feedback process, which consists of distributing a well-organized summary of the previous round to the participants to generate additional insights. This can reduce the effect of noise and dominant individuals, which could be a concern when using group-based processes, such as focus groups [17]. Another advantage is the flexibility of delivering this method. Electronic surveys allowed the experts to complete it at their own preferred time and location.

Another strength of the study is the focus on a specific type of injury, i.e., RTC-related compensable injury, rather than being too broad. This is specifically important for compensable injury, as the

type of compensation process and system could have an impact on recovery [2,45]. In addition, the study was focused on minor and moderate injuries, as this is an important but under researched group of RTC-related injuries. Within the Australian CTP system, the minor and moderate classification is based on the Abbreviated Injury Scale (AIS) [53] and includes all non-life threatening injuries. As such, there will be heterogeneity within this group of injuries, but this grouping has also been used in previous studies regarding recovery following road traffic crash-related injury [12,14,18–20] and the experts in this study did not raise it as a concern. Nevertheless, it should be noted that there may be differences in the specific factors that influence recovery based on injury type, such as impaired psychological or cognitive functioning as a result of brain injury.

A limitation of this study was that individuals injured in RTCs were not included and they may have a different perspective on recovery. A separate study was considered necessary for this group and would consist of modified surveys with less medical jargon. Previously, qualitative studies regarding experiences of the injured individual have led to language adjustments in clinical practice guidelines following RTCs [46] and to a better understanding of complexities within the compensation system [45]. For future research, it is important to investigate whether injured persons agree with the findings of this study. Another limitation is that most of the participating experts (approximately 85%) were from Australia and, as such, the findings may be only generalizable to the Australian setting. Furthermore, the different subgroups of experts (insurance representatives, health professionals and researchers) were small, but in line with general sample size recommendations for a Delphi study [17]. However, results of each subgroup may not be representative of each stakeholder population. This makes it difficult to accurately evaluate the differences between the stakeholder groups, which could be important given the differences between stakeholder groups reported previously [54].

Conclusions

This study established consensus for a definition for recovery and the most important factors that influence recovery. An established definition could facilitate communication and engagement between different stakeholders involved in the recovery process. The study showed that experts have broad knowledge of risk identification tools and mainly use generic multidimensional tools. Further research is needed to evaluate whether injured persons agree with the definition and on the utility of risk identification methods.

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References

[1] Motor Accident Insurance Commission. Motor Accident Insurance Commission - Annual report 2018-19. MAIC Publ. [Internet]. 2017. Available from: https://maic.qld.gov.au/publications/annual-report-2016-17/
[2] Samoborec S, Ruseckaite R, Ayton D, et al. Biopsychosocial factors associated with non-recovery after a minor transport-related injury: a systematic review. PLoS One. 2018; 13(6):e0198352.
[3] Carstensen TBW, Fink P, Oernboel E, et al. Sick leave within 5 years of whiplash trauma predicts recovery: a prospective cohort and register-based study. PLoS One. 2015;10(6): e0130298–18.
[4] Walton D. A review of the definitions of "'recovery' used in prognostic studies on whiplash using an ICF framework". Disabil Rehabil. 2009;31(12):943–957.
[5] Rissanen R, Berg HY, Hasselberg M. Quality of life following road traffic injury: a systematic literature review. Accid Anal Prev. 2017;108:308–320.
[6] Alharbi R, Mosley I, Miller C, et al. Factors associated with physical, psychological and functional outcomes in adult trauma patients following Road Traffic Crash: a scoping literature review. Transp Res Interdiscip Perspect. 2019;3: 100061.
[7] Dictionary of Medical Terms. 4th ed. 2004. London: A&C Black Publishers Ltd.
[8] Motor Accident Insurance Commission. MAIC guideline for compulsory third party (CTP) - Revised and updated 2012 [Internet]. 2012 [cited 2019 Jan 29]. p. 26. Available from: https://maic.qld.gov.au/wp-content/uploads/2016/02/MAIC_Guidelines_for_CTP_Rehabilitation_Providers_2013_Nov_26.pdf
[9] MAIC. How to settle your claim [Internet]. [cited 18 Sep 2019]. Available from: https://maic.qld.gov.au/how-to-settle-your-claim/
[10] World Health Organization. International classification of functioning, disability and health. Geneva: ICF; 2001.
[11] Raja SN, Carr DB, Cohen M, et al. The revised International Association for the Study of Pain definition of pain. Pain. 2020;161(9):1976–1982.
[12] Gopinath B, Jagnoor J, Kifley A, et al. Predictors of health-related quality of life after non-catastrophic injury

sustained in a road traffic crash. Ann Phys Rehabil Med. 2020;63(4):280–287.
[13] Ritchie C, Hendrikz J, Kenardy J, et al. Derivation of a clinical prediction rule to identify both chronic moderate/severe disability and full recovery following whiplash injury. Pain. 2013;154:2198–2206.
[14] Smits E, Brakenridge C, Gane E, et al. Identifying risk of poor physical and mental health recovery following a road traffic crash: an industry-specific screening tool. Accid Anal Prev. 2019;132:105280.
[15] Linton SJ, Boersma K. Early identification of patients at risk of developing a persistent back problem: the predictive validity of The Örebro Musculoskeletal Pain Questionnaire. Clin J Pain. 2003;19:80–86.
[16] Hill JC, Dunn KM, Lewis M, et al. A primary care back pain screening tool: identifying patient subgroups for initial treatment. Arthritis Rheum. 2008;59(5):632–641.
[17] Hsu C, Sandford BA. The Delphi technique: making sense of consensus. Pract Assessment Res Eval. 2007;12:1–8.
[18] Kenardy J, Heron-Delaney M, Hendrikz J, et al. Recovery trajectories for long-term health-related quality of life following a road traffic crash injury: results from the UQ SuPPORT study. J Affect Disord. 2017;214:8–14.
[19] Trippolini MA, Young AE, Pransky G, et al. Beyond symptom resolution: insurance case manager's perspective on predicting recovery after motor vehicle crash. Disabil Rehabil. 2019. DOI:10.1080/09638288.2019.1630857
[20] Samoborec S, Ayton D, Ruseckaite R, et al. Biopsychosocial barriers affecting recovery after a minor transport-related injury: a qualitative study from Victoria. Health Expect. 2019;22(5):1003–1012.
[21] MAIC. Reasonable and Appropriate Rehabilitation Guidance for CTP Insurers. 2020. Available from: https://maic.qld.gov.au/wp-content/uploads/2020/01/Rehab-decision-making-tool-updated-1-Feb-2020.pdf
[22] MAIC. Motor Accident Insurance Act 1994. 2019. Available from: https://www.legislation.qld.gov.au/view/html/inforce/current/act-1994-009#sec.4
[23] Brody H, Miller FG. The clinician-investigator: unavoidable but manageable tension. Kennedy Inst. Ethics J. 2003;13:329–346.
[24] Lidz CW, Appelbaum PS, Joffe S, et al. Competing commitments in clinical trials. IRB Ethics Hum Res. 2009;31:1–6.
[25] Hay-Smith EJC, Brown M, Anderson L, et al. Once a clinician, always a clinician: a systematic review to develop a typology of clinician-researcher dual-role experiences in health research with patient-participants. BMC Med Res Methodol. 2016;16:1–17.
[26] Bortsov AV, Platts-Mills TF, Peak DA, et al. Effect of pain location and duration on life function in the year after motor vehicle collision. Pain. 2014;155:1836–1845.
[27] Bostick GP, Carroll LJ, Brown CA, et al. Predictive capacity of pain beliefs and catastrophizing in Whiplash Associated Disorder. Injury. 2013;44(11):1465–1471.
[28] Buitenhuis J, De Jong PJ, Jaspers JPC, et al. Catastrophizing and causal beliefs in whiplash. Spine (Phila. Pa. 1976). 2008;33:2427–2433.
[29] Carroll LJ, Liu Y, Holm LW, et al. Pain-related emotions in early stages of recovery in whiplash-associated disorders: their presence, intensity, and association with pain recovery. Psychosom Med. 2011;73(8):708–715.
[30] Carstensen TBW, Frostholm L, Oernboel E, et al. Post-trauma ratings of pre-collision pain and psychological distress predict poor outcome following acute whiplash trauma: a 12-month follow-up study. Pain. 2008;139:248–259.
[31] Casey PP, Feyer AM, Cameron ID. Identifying predictors of early non-recovery in a compensation setting: the Whiplash Outcome Study. Injury. 2011;42(1):25–32.
[32] Gopinath B, Harris IA, Nicholas M, et al. A comparison of health outcomes in older versus younger adults following a road traffic crash injury: a cohort study. PLoS One. 2015;10(4):e0122732.
[33] Gopinath B, Jagnoor J, Nicholas M, et al. Presence and predictors of persistent pain among persons who sustained an injury in a road traffic crash. EJP. 2015;19(8):1111–1118.
[34] Myrtveit SM, Carstensen T, Kasch H, et al. Initial healthcare and coping preferences are associated with outcome 1 year after whiplash trauma: a multicentre 1-year follow-up study. BMJ Open. 2015;5(3):e007239–10.
[35] Nijs J, Inghelbrecht E, Daenen L, et al. Long-term functioning following whiplash injury: the role of social support and personality traits. Clin Rheumatol. 2011;30(7):927–935.
[36] Littleton SM, Cameron ID, Poustie SJ, et al. The association of compensation on longer term health status for people with musculoskeletal injuries following road traffic crashes: emergency department inception cohort study. Injury. 2011;42(9):927–933.
[37] Littleton SM, Hughes DC, Poustie SJ, et al. The influence of fault on health in the immediate post-crash period following road traffic crashes. Injury. 2012;43(9):1586–1592.
[38] Brunner F, Lienhardt SB, Kissling RO, et al. Diagnostic criteria and follow-up parameters in complex regional pain syndrome type I-a Delphi survey. Eur J Pain. 2008;12(1):48–52.
[39] Peters SE, Johnston V, Ross M, et al. Expert consensus on facilitators and barriers to return-to-work following surgery for non-traumatic upper extremity conditions: a Delphi study. J Hand Surg Eur Vol. 2017;42(2):127–136.
[40] Street TD, Lacey SJ. A systematic review of studies identifying predictors of poor return to work outcomes following workplace injury. Work. 2015;51(2):373–381.
[41] Young AE, Viikari-Juntura E, Boot CRL, Hopkinton Conference Working Group on Workplace Disability Prevention, et al. Workplace outcomes in work-disability prevention research: a review with recommendations for future research. J Occup Rehabil. 2016;26(4):434–447.
[42] McLinton S, McLinton SS, van der Linden M. Psychosocial factors impacting workplace injury rehabilitation: evaluation of a concise screening tool. J Occup Rehabil. 2018;28(1):121–129.
[43] Ritchie C, Ehrlich C, Sterling M. Living with ongoing whiplash associated disorders: a qualitative study of individual perceptions and experiences. BMC Musculoskelet Disord. 2017;18:1–9.
[44] Elbers NA, Akkermans AJ, Lockwood K, et al. Factors that challenge health for people involved in the compensation process following a motor vehicle crash: a longitudinal study Health behavior, health promotion and society. BMC Public Health. 2015;15(1):10.
[45] Murgatroyd D, Lockwood K, Garth B, et al. The perceptions and experiences of people injured in motor vehicle crashes in a compensation scheme setting: a qualitative study. BMC Public Health. 2015;15:423.
[46] Lindsay GM, Mior SA, Côté P, et al. Patients' experiences with vehicle collision to inform the development of clinical

practice guidelines: a narrative inquiry. J Manipulative Physiol Ther. 2016;39(3):218–228.
[47] Ritchie C, Hendrikz J, Jull G, et al. External validation of a clinical prediction rule to predict full recovery and ongoing moderate/severe disability following acute whiplash injury. J Orthop Sports Phys Ther. 2015;45(4):242–250.
[48] Iles R, Sheehan L, Munk K, et al. Development and pilot assessment of the PACE Tool: helping case managers identify and respond to risk factors in workers' compensation case management. J Occup Rehabil. 2020;30(2):167–182.
[49] Shaw WS, Reme SE, Pransky G, et al. The pain recovery inventory of concerns and expectations: a psychosocial screening instrument to identify intervention needs among patients at elevated risk of back disability. J Occup Environ Med. 2013;55(8):885–894.
[50] Griffin A, Jagnoor J, Arora M, et al. Evidence-based care in high- and low-risk groups following whiplash injury: a multi-centre inception cohort study. BMC Health Serv Res. 2019;19:1–17.
[51] Lin I, Wiles L, Waller R, et al. What does best practice care for musculoskeletal pain look like? Eleven consistent recommendations from high-quality clinical practice guidelines: systematic review. Br J Sports Med. 2020;54(2):79–86.
[52] Nguyen H, Rebbeck T, Kifley A, et al. Positive recovery for low-risk injuries screened by the short form-Örebro musculoskeletal pain screening questionnaire following road traffic injury: Evidence from an inception cohort study in New South Wales, Australia. BMC Musculoskelet. Disord. 2019;20:1–10.
[53] Association for the Advancement of Automotive Medicine. Abbreviated Injury Scale [Internet]. [cited 2018 Dec 5]. Available from: https://www.aaam.org/abbreviated-injury-scale-ais/
[54] Peters SE, Truong AP, Johnston V. Stakeholders identify similar barriers but different strategies to facilitate return-to-work: a vignette of a worker with an upper extremity condition. Work. 2018;59(3):401–412.