Research paper

Clinical practice guidelines for the use of traditional Korean medicine in the treatment of patients with traffic-related injuries: An evidence-based approach

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ABSTRACT

Introduction: In 2016, traditional Korean medicine (TKM) treatment for traffic-related injuries comprised 27.7% of Korea’s total car insurance medical coverage, and that proportion has been increasing annually. However, clinical practice guidelines (CPGs) that employ evidence-based medicine (EBM) methodology for traffic-related injuries have not been established in TKM. Therefore, the aim of this study was to develop a CPG for the treatment of traffic-related injuries in TKM by conducting a systematic literature review following EBM.

Methods: First, a network of experts was established to develop the CPG. Then, a systematic search of TKM treatments for traffic-related injuries was conducted using the Patients'/Populations—Intervention—Comparison—Outcome method. To measure the methodological quality of the systematic reviews and meta-analyses, the assessment of multiple systematic reviews was used. The Cochrane collaboration’s risk of bias tool was used to assess the randomised controlled trials.

Results: The CPG for the treatment of traffic-related injuries in TKM consisted of three parts: diagnosis, treatment, and prognosis. In total, 13 recommendations were developed, with two regarding diagnosis, 10 regarding treatment, and one regarding prognosis.

Conclusions: This CPG was developed by conducting a systematic literature review of randomised controlled trials. Therefore, this CPG can be adapted to different clinical status for traffic-related injuries. Specifically, it can be useful reference for traditional Chinese medicine and Kampo medicine practitioners using the same or similar interventions. In addition, the CPG can serve as an EBM model for countries unfamiliar with the complementary and alternative medicine treatment of traffic-related injuries.

1. Introduction

According to the 2015 World Health Organization (WHO) global status report on road safety, 1.25 million people die every year from traffic accidents worldwide. In 2014, a steady increase in the number of traffic accidents in Korea was observed. Specifically, a remarkable 223,552 cases were reported. In 2016, traditional Korean medicine (TKM) treatment for traffic-related injury comprised 27.7% of Korea’s total car insurance medical coverage, and that proportion has been increasing annually [1]. In 2016, the Korean Ministry of Health & Welfare reported that approximately 720,000 patients visit TKM clinics for traffic-related injuries, which was a 50.7% increase from the
480,000 patients who visited TKM clinics in 2014. Moreover, medical expenses associated with traffic-related injuries were reported to be approximately 459 billion won in 2016, which was a 68.9% increase from the estimated 272 billion won in 2014 [2].

Patients with traffic-related injuries often present with systemic symptoms, such as sprains, fractures, nerve damage, traumatic brain injuries, and severe organ damage to organ. A common ailment of traffic-related injuries is whiplash-associated disorder (WAD) caused by hyperextension or hyperflexion of the neck as a result of rapid acceleration or deceleration. However, patients with traffic-related injuries present with varying complexities of symptoms depending on the nature of the accident [3–5]. Since 1999, the Car Insurance Medical Coverage for traffic accident patients has also paid for traditional Korean medicine services alongside conventional medicine. The range of coverage in this program includes Chuna manual therapy, pharmacopuncture, digital infrared imaging, transcutaneous electrical nerve stimulator, interference current therapy, and meridian laser therapy in addition to the treatments covered by National Health Insurance. Traditional Korean medicine services for traffic accident patients complements Conventional Medicine treatments by relieving pain and promoting recovery of function, which explains the increasing use of TKM [6]. However, there are no useful clinical practice guidelines (CPG) for the use of TKM in the treatments of traffic-related injuries. Therefore, a comprehensive and standardised CPG for TKM that addresses the diagnosis, treatment, and prognosis of traffic-related injuries is needed. In 2016, the Korean government ordered the development of CPG for TKM in the treatment of traffic-related injuries and 30 other diseases to expand the contribution of TKM to the national public health care system [7].

Western countries have many CPG, such as the Quick Reference Guide for the Management of Acute Whiplash-Associated Disorder (Sydney, 2015) [8], the Minor Injury Guideline (Canada, 2011) [9], and the Clinical Guidelines for the Physiotherapy Management of Whiplash-Associated Disorder (London, 2005) [10]. However, CPGs that employ evidenced-based medicine (EBM) methodology for traffic-related injuries have not been established in TKM despite the increasing demand for TKM services.

The CPG presented here is based on a strict systematic literature review of EBM methodology and developed in accordance with the CPG development manual provided by the National Evidence-based Healthcare Collaborating Agency (NECA) in Korea [11]. This CPG for the use of TKM in the treatment of traffic-related injuries provides appropriate recommendations that address key clinical questions. This CPG can aid in the clinical decision-making process, improve the overall quality of TKM practice, and serve as a model for countries that are unfamiliar with the use of traditional medicine in the treatment of traffic-related injuries. In addition, this CPG can be useful reference for traditional Chinese medicine (TCM) and Kampo medicine practitioners using the same or similar interventions such as acupuncture, moxibustion, and cupping.

2. Methods

In accordance with the NECA CPG developmental manual, a professional group, a review committee group, and a working group were established through the cooperation of six related academic societies. The CPG was developed for adult patients with traffic-related injuries and consisted of three parts: diagnosis, treatment, and prognosis. Furthermore, this CPG includes clinically effective therapies derived from real clinical practice conditions. The target group of CPG is TKM doctors who are involved in the treatment of traffic-related injuries. Additionally, TCM and Kampo medicine practitioners who use same or similar interventions could also be a target group of this CPG.

2.1. Establishing the network of experts to develop the CPG

Three groups were placed in charge of this CPG: a professional group, a working group, and a review committee group (Appendix Eq. (1.1) in Supplementary material). The professional group oversaw the general review of specialty and academic research for the use of TKM in the treatment of traffic-related injuries. The working group collected data about key clinical questions and used this data to draft a version of the CPG. The review committee reviewed, revised, and supplemented the final CPG.

2.2. CPG development process

The CPG was developed in accordance with NECA guidelines. First, 13 key clinical questions were identified through the analysis of domestic and international CPGs. There were two clinical questions of diagnosis, ten clinical questions of treatment, and one clinical question or prognosis (Appendix Eq. (C.1) in Supplementary material). Second, meaningful clinical data were extracted from the literature and used to make recommendations. All systematic review processes followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) recommendation of summarizing the evidence of each clinical question. During this process, objective and validated methodological tools, such as Review Manager 5.3, Cochrane collaboration’s tool for assessing risk of bias (ROB) for randomised controlled trials, and assessment of multiple systematic reviews (AMSTAR), were used to evaluate the systematic reviews. The RAND-UCLA Appropriateness Method, which is a modified Delphi method, was applied to validate the final recommendation [12]. The Korean Academy of Oriental Rehabilitation Medicine, Korean Society of Chuna Manual Medicine for Spine and Nerves, Korean Society of Oriental Neuropsychiatry, and the Korea Immuno-Pharmacocupuncture Association reviewed and approved this CPG for traffic-related injuries. The Korea Acupuncture and Moxibustion Medicine Society did not review and approve this CPG. The overall process is summarised in Fig. 1.

2.3. Search strategy

A search was conducted in the order of diagnosis, treatment, and prognosis. The core, standard, ideal model proposed by the National Library of Medicine was used to select the databases to be included in the literature search [13]. Pubmed, Ovid-MedLine, EMBASE, and Cochrane CENTRAL were used as the foreign core databases. KoreaMed, Kmbase, KISS, and NDSL were used as the domestic core databases. A standard database is characterised by themes different from those of a core database. CNKI was used as a foreign standard database and OASIS and RISS were used as domestic standard databases. The ideal database includes abstracts of academic conferences, unpublished literature, and current clinical trials. In this study, the clinical manual textbook was considered to be an ideal database.

2.4. Literature search

A committee that met once a month selected the databases to be included in the study based on the inclusiveness and accessibility of the literature searches. The study design of this CPG was a randomised controlled trial. A systematic search of TKM treatments for traffic-related injuries was conducted using the Patients/Populations–Intervention–Comparison–Outcome method, with a focus on the Patients/Populations and Intervention components to ensure a comprehensive search. In the domestic databases, complex searches could not be correctly performed, so the databases were mined with a comprehensive keyword based on Patients/Populations component.

Patients/Populations and Interventions are explained in Table 1. Comparisons: Controls were included if they were real and valid clinical cases in South Korea. The following groups were compared:
sham acupuncture group, inactive control group, simple conventional treatment group, a single Korean medicine treatment group, and a combined Korean medicine treatment group.

Outcomes: Outcomes were included if they were valid and acceptable key clinical questions. The following tools were used to measure pain outcomes: visual analogue scale, numeric rating scale, Short-Form McGill Pain Questionnaire, Brief Pain Inventory–Short Form, and neck pain questionnaire. Disability outcomes were measured using range of motion and the neck disability index. In addition, the adverse events of each intervention group [14–17] when used improperly were summarised in the Appendix Eq. (A.2) in Supplementary material.

2.5. Selection of data

Two independent researchers selected the data to be included from the literature search. First, the literature was screened by title and abstract and any duplicate articles or studies were excluded. Second, the literature was screened for full-text articles only. If there was a disagreement in the selection process, consensus was achieved through discussion or the consultation of a third party. PRISMA was used to select the inclusion and exclusion criteria (Appendix Eq. (B.1) in Supplementary material).

Inclusion criteria:

1) Study population of adult patients (19–70-years-old) with neck pain or low back pain;

<table>
<thead>
<tr>
<th>Table 1 Population/Intervention.</th>
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<tr>
<td>Clinical Key Question</td>
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<tr>
<td><strong>Diagnosis</strong></td>
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<tr>
<td>CQD 01</td>
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<tr>
<td>CQD 02</td>
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<tr>
<td><strong>Treatment</strong></td>
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<td>CQT 10</td>
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<tr>
<td><strong>Prognosis</strong></td>
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<tr>
<td>CQP 01</td>
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</tbody>
</table>

Clinical Question of Diagnosis (CQD)/Clinical Question of Treatment (CQT)/Clinical Question of Prognosis (CQP).
2. Study population of adult patients (19–70 years-old) with fracture or acute post-traumatic stress disorder (PTSD);
3. Systematic reviews and meta-analyses related to traffic injuries and randomised controlled trials including traditional Korean medicine methods in the treatment of patients with traffic-related injuries.

Exclusion criteria:
1) Studies in which the objective evaluation method was not specified;
2) Studies that did not include traditional Korean medicine treatment methods;
3) Non-randomised controlled trials; and
4) A manual therapy that cannot be performed by a legal medical license holder (i.e., Korean medicine doctor).

2.6. Analysis and assessment of literature

2.6.1. Quality assessment
To measure the methodological quality of the systematic reviews and meta-analyses, AMSTAR was used. The Cochrane collaboration’s ROB tool was used to assess the randomised controlled trials [18,19]. We used Appraisal of Guidelines for Research and Evaluation II instrument to assess the quality of guidelines [20]. All studies were evaluated and approved by two or more independent researchers.

2.6.2. Classification of the level of evidence
The grading of recommendations assessment, development, and evaluation (GRADE) method, developed by the GRADE working group [21], was used to evaluate the level of evidence of the CPG guidelines. The GRADE evaluation process consisted of three steps.

In the first step, health care questions that are important to real clinical conditions were defined and supporting literature was collected. In the second step, key clinical questions were selected from a review of the literature. In the third step, the level of evidence was determined by summarizing the results. In the present study during this process, the initial level of evidence was determined for each study design (i.e., randomised controlled trials have a high level of evidence, while observational studies have a low level of evidence). Then, the final level of evidence was determined by adjusting the evidence level according to the ROB, consistency, and directness of the study. As a result, this CPG has four levels of evidence. Details of evidence are given in the Appendix Eq. (D.1) in Supplementary material.

We added GRADE information about acupuncture, pharmacopuncture, and moxibustion in Table 2. However, GRADE evaluation of the other intervention in this CPG could not be performed because the evidence level was low. We explained the GRADE approach regarding evidence and summary of clinical findings in Appendix Eq. (L.1) in Supplementary material.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Grade</th>
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<tr>
<td>Acupuncture</td>
<td>Risk of bias</td>
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<tr>
<td>Number of studies</td>
<td>Neck pain (4 RCTs)</td>
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<td></td>
<td>NDI (3 RCTs)</td>
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<tr>
<td>Pharmacopuncture</td>
<td>Number of studies</td>
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<tr>
<td></td>
<td>VAS (2 RCTs)</td>
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<td>NDI (1 RCT)</td>
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<td>ROM (1 RCT)</td>
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<td>Moxibustion</td>
<td>Number of studies</td>
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<tr>
<td></td>
<td>VAS (1 RCTs)</td>
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<td></td>
<td>NDI (1 RCT)</td>
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2.6.3. Developing recommendations
Recommendations were made based on the clinical questions. The recommendation grade was obtained by considering the difference between the desirable and undesirable results, with the acknowledgment of potential net benefits from TKM interventions. The recommendation grade was classified from A to D and with the Good Practice Point (GPP), which referred to a previous CPG [22–26].

Grade A was given when the net benefit of implementing the recommendation was large. Grades B, C, and D were given in a descending order in accordance with ratio of benefit and harm. The GPP grade was recommended based on a consensus of clinical experts on traffic injuries, even if the evidence was lacking. Specifically, the development committee made a formal agreement based on the draft of the recommendation through one external review and one face-to-face expert panel meeting through the pre-configured online questionnaires. Formal agreements were derived using the modified Delphi method (RAM). GPP was then drawn up through one expert meeting on the agreed recommendations.

If the recommendation had a low level of evidence, but had an obvious benefit or clinical value, the recommendation grade was upgraded after the careful consideration of the committee. Recommendations on TKM treatments for traffic-related injuries are summarised in the Appendix Eq. (E.1) in Supplementary material.

2.6.4. Peer review and consensus of recommendations
A draft of the CPG was created by the working group after conducting a literature search and analysing the articles for methodology, systematic reviews, and meta-analyses related to TKM treatment and traffic-related injuries. A final version was approved by an independent expert panel.

The expert panel consisted of specialists recommended by academic societies associated with the development of the CPG. In total, there were 11 experts from the following societies: the Korean Academy of Oriental Rehabilitation Medicine (n = 1), Korea Immuno-Pharmacocupuncture Association (n = 1), Korean Society of Oriental Neuropsychiatry (n = 1), Society of Sports Korean Medicine (n = 1), Korea Institute of Oriental Medicine (n = 2), including a CPG methodology specialist, and current TKM practitioners (n = 2).

The expert panel approved the CPG in accordance with the Delphi method. Two separate meetings were conducted: one external review using an online questionnaire and one face-to-face meeting based on the draft version of recommendations.

2.6.5. Updates of the CPGs
Two years after the publication of the CPG, we plan to supplement the shortcomings of the current CPG and update the recommendations with new clinical research results. This process will involve the collection of opinions from various experts and patients through post-clinical monitoring and clinical evidence accumulation.
3. Results

The CPG consisted of three parts: diagnosis, treatment, and prognosis. A total of 13 recommendations were developed. A summary of the total recommendations is in Appendix Eq. (E.2) in Supplementary material, and the full explanation of the total recommendations and evidences is described in Appendix Eq. (F.1-H.1) in Supplementary material.

3.1. Diagnosis

3.1.1. Integrative treatment of TKM and conventional medicine [27]

Since 1951, when the dual health care system was first established in Korea, Korean Medicine doctors and conventional medicine doctors have maintained a conflicting relationship. Although conflict between Korean Medicine doctors and conventional medicine doctors has continued, integrative treatments from both Korean and conventional medicine have been provided expediently to inpatients in Korean Medicine hospitals. For example, when a cerebrovascular infarction patient is treated in a Korean Medicine hospital, he or she receives acupuncture and herbal medicine treatment while simultaneously undergoing radiographic examination with antihypertensive and thrombolytic medicine. To provide radiographic examinations and conventional medications, most Korean Medicine hospitals have had to establish separate conventional medicine clinics or form partnerships with conventional medicine hospitals.

Recommendation (grade/level of evidence)

Medical cooperation is recommended for WAD III, IV (Appendix Eq. (K.1) in Supplementary material suspected patients by using physical examination of all ages based on clinical experience of the CPG development group (GPP/Insufficient) (Appendix Eq. (F.1) in Supplementary material).

3.1.2. Pattern identification [28,29]

Pattern identification is a unique diagnostic system of Korean medicine that distinguishes itself from conventional medicine. It is an important factor in determining treatment direction. The terms used in this paper were selected based on the WHO international standard terminologies on traditional medicine in the western pacific region [30]. Recommendation of pattern identification in this CPG was based on the questionnaire survey of 1294 Korean medicine doctors [31]. Blood stagnation syndrome was the most frequent pattern identification of the traffic accident injuries in this survey.

Recommendation (grade/level of evidence)

Static blood is the first pattern of patients with traffic-related injuries regardless of age, and herbal medicine is recommended when a more detailed pattern is identified according to qi-blood, zang-fu organs, cold-heat, or yin-yang. TKM treatment is recommended to be combined with standard care for the alleviation of pain and the improvement of function in adult patients (19–70-years-old) with fracture (GPP/Insufficient) (Appendix Eq. (F.2) in Supplementary material).

3.2. Treatment

3.2.1. Acupuncture treatment [32–39]

Recommendation (grade/level of evidence)

1. To decrease objective pain on the pain scale, a combination of usual care with acupuncture treatment (or electroacupuncture) should be considered in WAD I, II adult patients (19–70-years-old), as compared to other usual care. (B/Moderate).

2. To improve indicators of functional scale, a combination of usual care with acupuncture treatment (or electroacupuncture) should be considered in WAD I, II adult patients (19–70-years-old), as compared to other usual care (C/Low).

3. Usual care with additional acupuncture treatment (or electroacupuncture) is recommended for alleviation of pain and functional improvement of low-back pain in WAD I, II adult patients (19–70-years-old) (GPP/Insufficient) (Appendix Eq. (G.1) in Supplementary material).

3.2.2. Pharmacopuncture treatment [33,36,40–43]

Recommendation (grade/level of evidence)

1. To decrease objective pain on the pain scale, a combination of acupuncture and pharmacopuncture according to differentiation of syndromes should be considered for symptom alleviation of neck pain in WAD I, II adult patients (19–70-years-old), as compared to acupuncture treatment only (B/Moderate).

2. To improve indicators on the functional scale, a combination of acupuncture and pharmacopuncture according to differentiation of syndromes should be considered for functional improvement of neck pain in WAD I, II adult patients (19–70-years-old), as compared to acupuncture treatment only (C/Low).

3. Pharmacopuncture only or combined therapy is recommended for alleviation of pain and functional improvement in WAD I, II adult patients (19–70-years-old) with low-back pain (GPP/Insufficient) (Appendix Eq. (G.2.) in Supplementary material).

3.2.3. Chuna manual therapy [44,45]

Manual medicine is a comprehensive term commonly used to refer to all manipulation therapy. In Korea, manual medicine is usually referred to as Chuna. Chuna Manual Therapy is only performed by doctors of Korean medicine (KMDs) using hands or other body parts as necessary with of medical devices or tools such as Chuna manual tables. Accordingly, we excluded manual therapies reflecting Korean medicine because only KMDs practice Chuna manual medicine. Therefore, we focused on Chuna manual therapy instead of including all manual therapies. There are contraindications when doing Chuna manual therapy; therefore, practitioners must understand these contraindications, which are shown in Appendix Eq. (J.1) in Supplementary material.

Recommendation (grade/level of evidence)

1. Chuna manual therapy only or combined treatment is recommended for alleviation of pain and functional improvement of neck pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient).

2. Chuna manual therapy only or combined treatment is recommended for alleviation of pain and functional improvement of low-back pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient) (Appendix Eq. (G.3) in Supplementary material).

3.2.4. Moxibustion treatment [40,46,47]

There are two types of moxibustion: direct moxibustion and indirect moxibustion. Indirect moxibustion was used in this CPG; five to seven cones of moxibustion per treatment are commonly used. [48]

Recommendation (grade/level of evidence)

1. To decrease objective pain on the pain scale, a combination of acupuncture and indirect moxibustion may be considered for neck pain in WAD I, II adult patients (19–70-years-old), as compared to acupuncture treatment only (C/Low).

2. To improve indicators regarding the functional scale, a combination of acupuncture and indirect moxibustion may be considered for neck pain in WAD I, II adult patients (19–70-years-old), as compared to acupuncture treatment only (C/Low).

3. Moxibustion only or combined therapy is recommended for symptom alleviation and functional improvement of low-back pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient) (Appendix Eq. (G.4) in Supplementary material).
3.2.5. Cupping [49,50]
Recommendation (grade/level of evidence)
1. Cupping only or combined therapy is recommended for symptom alleviation and functional improvement of neck pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient).
2. Cupping only or combined therapy is recommended for symptom alleviation and functional improvement of low back pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient) (Appendix Eq. (G.5) in Supplementary material).

3.2.6. Oriental physiotherapy [51,52]
Oriental physiotherapy encompasses non-invasive therapies applied to treat traffic accident injuries more efficiently. It includes conduction exercises, which are specially designed physical movements and breathing exercises; electrotherapy, which applies modern physical therapy to meridian and acupoints; and hydrotherapy, which is physical therapy to promote blood circulation and treat diseases by applying water’s physical characteristics such as temperature and pressure [53].
Recommendation (grade/level of evidence)
1. A combination of oriental physiotherapy and usual care is recommended for symptom alleviation and functional improvement of neck pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group, as compared to other usual care alone (GPP/Insufficient).
2. A combination of oriental physiotherapy and usual care is recommended for symptom alleviation and functional improvement of low back pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group, as compared to other usual care alone (GPP/Insufficient) (Appendix Eq. (G.6.) in Supplementary material).

3.2.7. Herbal medicine treatment
Based on the survey results mentioned in the pattern syndrome, we made a recommendation with herbal medicine prescriptions widely used in the clinical field. The mainly prescribed herbal medications related to the traffic injury diagnosis are Danggui-xu-san, Wuji-san, and Gegen-tang. Recommendation (grade/level of evidence)
1. Herbal medicine only or combined therapy according to pattern identification is recommended for symptom alleviation and functional improvement of neck pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient).
2. Herbal medicine only or combined therapy according to pattern identification is recommended for symptom alleviation and functional improvement of low back pain in WAD I, II adult patients (19–70-years-old) based on the clinical experience of the CPG development group (GPP/Insufficient) (Appendix Eq. (G.7) in Supplementary material).

3.2.8. Treatments for fracture [52,54,55]
Recommendation (grade/level of evidence)
1. In combination with traditional Korean medicine interventions such as acupuncture, herbal medicine is recommended for symptom alleviation and functional improvement of fracture in adult patients (19–70-years-old) based on the clinical experience of the CPG development group, as compared to usual care alone (GPP/Insufficient) (Appendix Eq. (G.8) in Supplementary material).
2. After fracture, traditional Korean medicine treatments can be considered for conservative treatment, rehabilitation treatment, or delayed union.

3. Acupuncture treatment is considered for pain control, joint stiffness, reduction of range of motion. If a patient has a cast, remote acupuncture point needling can be useful.
4. In the case of herbal medicine, it can be divided into early, middle, and late regimens.

4-1. At 1–2 weeks after fracture injury, herbal medicine to activate blood and resolve stasis can be used to clear heat and to cool the blood
4-2. At 3–6 weeks after injury, herbal medicine can be used therapeutically to treat blockage of meridian with muscle contraction.
4-3. In the post-injury period after 7 weeks, herbal medicine for tonifying qi and blood can be used to nourish blood and qi.

Korean medicine terms used in this CPG are selected from the WHO international standard terminology on traditional medicine in the western Pacific region.

3.2.9. Treatments for PTSD [56,57]
Recommendation (grade/level of evidence)
1. A combination of traditional Korean medicine interventions such as acupuncture and herbal medicine is recommended for improving psychological symptoms of adult patients (19–70-years-old) with acute PTSD as a result of a traffic accident based on the clinical experience of the CPG development group, as compared to usual care only (GPP/Insufficient) (Appendix Eq. (G.9) in Supplementary material).

3.2.10. Combination of Chuna manual therapy and pharmacopuncture
Recommendation (grade/level of evidence)
1. A combination of Chuna manual therapy and pharmacopuncture is recommended for symptom alleviation of neck pain and functional improvement in WAD I, II adult patients (19–70-years-old), as compared to Chuna manual therapy alone or pharmacopuncture alone (GPP/Insufficient).
2. A combination of Chuna manual therapy and pharmacopuncture is recommended for symptom alleviation of low back pain and functional improvement in WAD I, II adult patients (19–70-years-old), as compared to Chuna manual therapy alone or pharmacopuncture alone (GPP/Insufficient) (Appendix Eq. (G.10) in Supplementary material).

3.3. Prognosis [58,59]
Recommendation (grade/level of evidence)
A combination of traditional Korean medicine interventions such as acupuncture and herbal medicine is recommended for improving the rate of returning to everyday life or workplace for patients with traffic accident injuries (GPP/Insufficient) (Appendix Eq. (H.1) in Supplementary material).

4. Discussion
Traffic-related injuries are associated with a complicated range of symptoms that depend on a number of factors, such as the severity of the accident, insurance and litigation issues, and physical and mental factors [4,5,60,61]. In the differential diagnosis of patients with traffic-related injuries, abnormal clinical findings may not necessarily be directly related to the cause of the symptoms. Conversely, a symptom can be present without any abnormal clinical findings. Therefore, qualitative research literature on the treatment of patients with traffic-related injuries was reviewed [62-66]. Furthermore, we examined the systematic review titled “CPG for the management of conditions related to traffic collisions”, published in 2015 [67], which included studies ranging from musculoskeletal disorders to psychological disorders. However, most recommendations focused on WAD and mild traumatic...
brain injuries. In addition, they did not consider complementary and alternative medicine therapies intervention. Therefore, we focused on establishing CPG based on complementary and alternative medicine, especially East Asian medicine, including TKM, TCM, and Kampo. Moreover, we wanted to provide patients with sufficient information, such as a definitive diagnosis and treatment options and methods: this point was incorporated into the CPG.

This CPG was developed by collecting all of the relevant literature to date and systematically assessing the quality and clinical efficacy of each study. This allowed the clinical status and level of evidence for the traffic injury to be analysed; however, this study found a lack of evidence for making some of the recommendations. This study also identified fields that need future clinical research support. This CPG is not intended to restrict the medical activities of TKM practitioners and it is not made for health insurance screening standards. Furthermore, it cannot be the basis of legal judgments concerning the medical treatment performed on patients in a specific clinical situation. This CPG is solely intended to help the decision-making process of doctors treating patients with traffic-related injuries and to assist with the policy-making process.

4.1. Limitations

This CPG had three limitations. First, the CPG had a lack of qualitative and quantitative evidence for recommending TKM practices in the treatment of traffic-related injuries. Many of the recommendations had low levels of evidence or an insufficient GPP when the GRADE methodology was applied. In addition, since many studies did not describe the randomisation methodology, the ROBs were often high or unclear. In particular, studies regarding TKM treatment for fracture were limited, thus the level of evidence of fracture-related TKM treatments was low. Accordingly, it was replaced by the GPP recommendation. Additionally, whiplash-related research has been mainly included because of the high level of evidence-based data. Further, there was a large variation in the treatment effect estimates because of high heterogeneous controls and treatment methods. As a result, the heterogeneity of evidence was often high and resulted in weak recommendations.

The second limitation of the CPG was the difficulty of developing recommendations for individual therapies because of the limited number of studies on individual studies, with the exception of acupuncture, moxibustion, pharmacopuncture, and Chuna manual therapy. Many cases were not included in the analysis because they involved combination therapy, so a single treatment effect could not be determined.

The third limitation of the CPG is that not all TKM doctors agree with these recommendations and not all of these recommendations can be applied to a clinical site. This point should be addressed in the next version of the CPG by monitoring the clinical fields. All societies involved in the development of the CPG for traffic-related injury treatment should promote and share the CPG with the medical community.

4.2. Further research for CPG clinical evidence and application

For the TKM fields currently lacking clinical evidence, including acupuncture, moxibustion, cupping, and Chuna manual therapy, future clinical research is needed. In the field of acupuncture treatment, there is little clinical research on acupuncture methods, such as the length of the acupuncture, depth of the acupuncture, and needle retention time of the acupuncture. Therefore, quantitative and clinical studies on acupuncture treatment should be conducted in accordance with the Standards for Reporting Interventions in Controlled Trials of Acupuncture guidelines.

In addition, future studies are needed concerning the combination of Chuna manual therapy and pharmacopuncture. Currently, Chuna manual therapy and pharmacopuncture are widely practiced within clinical settings to treat patients with traffic-related injuries. The combination of these two treatments is believed to promote synergistic treatment effects; however, these effects have not been confirmed because there have been no well-designed clinical studies. Similarly, there is a lack of clinical research on the use of TKM to treat patients with PTSD or acute stress disorders. Therefore, future research is needed on these topics.

The quality and quantity of studies regarding TKM treatment for fracture are too weak to draw definitive guidelines. This shortcoming should be addressed through pilot studies and multi-centre studies from 2018 to 2019.

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Conflict of interest

All members of the development group have demonstrated a practical and economic stakeholder relationship with a specific institution or researcher involved in this CPG. To minimise the conflicts of interest, we have declared a conflict of interest and indicate that the organization of the financial sponsoring organisation did not influence any part of the recommendation. All members signed and submitted a declaration of conflict of interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found in the online version, at https://doi.org/10.1016/j.eujim.2018.01.003.

References
