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Research paper

Determination of the feasibility of a multicomponent intervention program to prevent delirium in the Intensive Care Unit: A modified RAND Delphi study

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ABSTRACT

Background: Delirium is common in Intensive Care Unit (ICU) patients and associated with poor outcome. In non-ICU patients a multicomponent intervention program with non-pharmacological interventions has shown to reduce delirium. Currently, there is insufficient evidence regarding the effects of such a program in ICU patients. We developed a draft program based on a review. As most studies were conducted in non-ICU patients, the feasibility of the program in ICU patients needs to be assessed before investigating its effectiveness.
Objectives: To determine experts' opinion and to achieve group consensus on the feasibility and completeness of the multicomponent intervention program for ICU patients.
Methods: A modified RAND/UCLA Appropriateness Method Delphi study was used. A total of 38 experts were selected following purposive sampling. Round one informed the experts about the draft program and asked for their opinion about its feasibility and completeness. In round two the experts were asked to reconsider their opinion based on changes made, and to rank the interventions in order of importance. The feasibility was scored using a 9-point Likert scale. A disagreement index (DI) and panel median were calculated to determine the level of agreement.

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Results: During Delphi round one 100% of the questionnaires was completed, during round two 79%. After two rounds the experts agreed on the feasibility of the interventions targeting sleep deprivation (panel median 7.00, DI 0.26), immobility (panel median 8.00, DI 0.22), visual and hearing impairment (panel median 8.00, DI 0.19), and cognitive impairment (panel median 8.00, DI 0.23), except for cognitive training (panel median 5.00, DI 0.52).
Conclusions: During this study a feasible multicomponent intervention program to prevent ICU delirium was developed based on expert consensus. As no consensus was reached on cognitive training, a pilot study is planned to determine the feasibility of cognitive training in the ICU.

1. Introduction

Delirium is a common acute brain disorder in Intensive Care Unit (ICU) patients associated with serious short- and long-term consequences, including a higher rate of mortality, re-intubations, and ICU readmissions, longer ICU and hospital length of stay, longer duration of ventilation, increased risk for use of physical restraints and long-term cognitive problems.[1–6] In addition, delirium is a financial burden due to increased ICU and hospital costs.[7] These negative consequences emphasise the need for strategies to prevent delirium.[8]

As multiple risk factors are associated with delirium in critically ill adults,[9–11] it is plausible that delirium prevention strategies should target multiple risk factors.[12,13] Non-pharmacologic approaches that target modifiable risk factors to prevent delirium appear promising.[12,14–19] In non-ICU patients it has been shown that a multicomponent non-pharmacological intervention (MCI) program targeting several delirium risk factors can significantly reduce delirium incidence and duration.[15,18] Studies in ICU patients that focus on specific parts of the program also showed beneficial effects.[14,16,17,20,21] However, there is currently insufficient evidence for the effects of a MCI program in ICU patients due to weaknesses in study design, sample size or problems with data collection.[13,22] Therefore, further research is needed into the effects of a MCI program on delirium in ICU patients.

In preparation of a randomised controlled trial to study the effects of a MCI program on delirium in ICU patients, a draft MCI program was developed based on a review of existing literature which mainly included studies in non-ICU patients. The draft MCI program, consisting of nursing and physical therapy interventions, focuses on the modifiable delirium risk factors cognitive impairment, sleep deprivation, immobility, and visual and hearing impairment. In view of the fact that the draft MCI program contains several interventions with interacting components, the MCI program is considered to be a complex intervention according to the MRC framework.[23,24]

Since it is uncertain whether the draft MCI program is feasible in an ICU setting, the aim of this current study is to determine experts' opinion and to achieve group consensus on the feasibility and completeness of the draft MCI program for ICU patients. Assessing the feasibility of a complex intervention is an important element in the development and evaluation of an intervention according to the MRC framework.[23,24]

2. Methods

A modified RAND/UCLA Appropriateness Method (RAM) Delphi study was used.[25] This method was chosen since it allows to include experts from diverse regions and expertise, without the need to meet physically. As a result the experts stay anonymous for each other, eliminating the influence of dominant persons during the consensus forming.[26,27] Multiple stages from RAM were used, including a literature review and individual feasibility rating and ranking of the interventions. A panel meeting was not part of this study for reasons of feasibility and logistics, like travel time and irregular shifts.

Table 1
Participants characteristics.

Characteristics	Delphi round 1	Delphi round 2
Response rate, N (%)	38 (100)	30 (79)
Age, years (mean ± SD)	42 ± 7.7	41 ± 7.7
Male, N (%)	18 (47.4)	13 (43.3)
Education, N (%)		
Higher professional education	23 (60.5)	19 (63.3)
Academic level	15 (39.5)	11 (36.7)
Profession, N (%)		
ICU nurse	12 (31.6)	9 (30.0)
Physical therapist	12 (31.6)	11 (36.7)
Intensivist	12 (31.6)	9 (30.0)
Delirium researcher	2 (5.2)	1 (3.3)

A literature review was conducted to develop a draft of the MCI program in the form of an intervention protocol. The review mostly included studies conducted in non-ICU patients, supplemented with studies conducted in ICU patients. The latter category only consisted of studies focusing on single interventions from the MCI program. Each intervention aimed at cognitive impairment, sleep deprivation, immobility, and visual and hearing impairment was included if it was considered feasible to be carried out by an ICU nurse. Interventions aimed at dehydration and feeding were not included as these items are incorporated in daily clinical ICU practice already. See Appendix A in the Supplementary material for the references used.

Feasibility of the individual interventions was scored using a 9-point Likert scale. This Delphi study consisted of two rounds and an anonymous expert panel. After the last round the experts received a final report with the results and conclusions of the Delphi study.

2.1. Participants

Purposive sampling was conducted based on predetermined selection criteria,[28] to recruit experts who were representative for the clinical ICU practice in the Netherlands in which the MCI program will be tested in the future, and who have the appropriate knowledge about delirium and nursing interventions.[29,30] Inclusion criteria for panel members were: membership of a delirium working group in their ICU and/or having special interest in the subject delirium; registered critical care nurse, intensivist or physical therapist working in a representative ICU from both academic and general hospitals, or work as a delirium researcher; appropriate knowledge about nursing interventions. One independent contact person per hospital, which guaranteed voluntary participation, recruited experts for the panel according to the inclusion criteria.[29] The participating hospitals in this Delphi study have ICUs equipped for surgical, medical, neurology/neurosurgical, or trauma ICU patients. Three experts, including a registered critical

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