

Application of Fuzzy Delphi method to identify elements for designing and developing an immunization information system

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ABSTRACT

Introduction: The Fuzzy Delphi approach has been widely used in numerous research disciplines to systematically collect expert input on a specific topic. It has also in recent years started to gain popularity in health-related research, especially in gathering expert consensus. Immunization information system is defined as population-based systems that are confidential and computerized responsible for the collection and consolidation of vaccination data from providers of vaccination which can be used in the arrangement and sustenance of effective immunization strategies. Many elements, items and functions of an immunization information system need to be identified and included to develop a comprehensive system to support immunization efforts throughout the population. This study aimed to apply the Fuzzy Delphi Method in identifying elements and items for designing and developing an immunization information system. **Materials and Methods:** A list of items was collected from the literature review consists of elements and functions necessary in developing an immunization information system. A total number of 30 items were selected and categorized accordingly into 3 main groups which are data of a patient, data associated with the vaccination and functions of the system. The questionnaire was later sent to a group of experts in their respective fields, chosen due to their expertise in public health and immunization data systems; thus, for the checklist evaluation, twelve experts were involved in evaluating 30 items. Finally, for the validation process, the Fuzzy Delphi Method using Triangular Fuzzy Numbers and the Defuzzification process was used. The Fuzzy Delphi Method application in short requires the fulfilment of 3 prerequisite conditions for the items to be accepted which are, threshold value of (d) less or equal to 0.2, total percentage of expert consensus of at least 75% and average Fuzzy numbers (A value) of more than 0.5. **Results:** A 100% response rate was obtained from all the twelve experts with an average Likert scoring of three to five. Post Fuzzy Delphi Method analysis, for the first condition, 4 out of 30 items (13.33%) did not fulfil the requirements. As for the second condition, 3 out of 30 items (10.00%) seem to have less than 75% expert consensus while the third condition sees that 8 out of 30 items (26.67%) failed to meet the requirements. Overall, 9 out of 30 items (30.00%) did not fulfil one or more of 3 prerequisite conditions and thus all those 9 items were discarded from the list and the remaining 21 items were accepted into the list to further develop an immunization information system. **Conclusion:** The application of the Fuzzy Delphi Method is useful in obtaining expert opinion and consensus to decide on the item's suitability to be included in the immunization information system. These accepted items can be further used in developing the immunization information system as per experts' consensus.