Research Article

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Do Representatives Represent you?

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Abstract

Introduction: Representation by a small group of chosen representatives is a common used strategy for decision making within a large heterogeneous group of people. In hospital and first-line setting, we measured the level of representatives-peers agreement for representatives that were selectively chosen by peers and those that were randomly selected.

Method: Professionals working in hospital-obstetric and first-line midwifery domains, 23 representatives and 114 represented peers, gave their opinion on obstetric topics by ranking 681 statements on a 10-point Likert-scale. Correlations between representatives and peers scores were assessed with Bland-Altman difference plots. Level of agreement was evaluated by area under the curve (AUC) of the difference in statement score.

Results: Statement scores of chosen representatives correlated well with their peers ($r = 0.91$). Fifty percent of representatives and peers scores differed less than 1.9 point. The average representative-peers agreement was 77%. Selectively chosen gynecologists and midwives showed comparable levels of agreement (gyn AUC 0.77 vs. mid AUC 0.75, $p = 0.105$), whereas randomly selected professionals tend to differ in professional view (gyn AUC 0.80 vs. mid AUC 0.74, $p = 0.052$). The selection method led to no differences within the group of gynecologists (chosen AUC 0.77 vs. random AUC 0.80, $p = 0.220$) and midwives (chosen AUC 0.75 vs. random AUC 0.74, $p = 0.859$).

Conclusion: Decision making by representatives within a diverse group of professionals, largely reflects the opinion of their peers. The selection method of representatives and the professionals' working environment do not statistically affect the level of representative-peers agreement.

Keywords: Representatives, Representation, Decision making, Agreement

Introduction

Collaboration of professionals across overlapping disciplines, each with their own view and perspectives, requires shared and supported guidelines regarding medical decision making. To come to shared guidelines, a bottom-up development strategy is thought to result in a stronger supported inter-professional directive.

Allowing the ideas of a diverse group of professionals across various disciplines to be captured at an early stage of the development process [1,2]. When people are consulted about their ideas and opinions, they typically feel better about a decision, even when the decision does not correspond with their preference [2]. Furthermore, to reach an agreement it is important to have a setting where participants are aware of each other's opinion

and arguments and can respond to them. Participants in multi-disciplinary decision-making must first agree on the level of agreement needed to move forward: unanimous consent, near unanimity, a super or simple majority, an executive committee, or the vote of a committee made up of representatives from each group [3].

When a large heterogeneous group has to make decisions, a strategy using a small group of chosen representatives weighing the balance of disciplines represented in the group is thought to be most efficient [2]. These representatives are expected to reflect the opinions of their group, rather than insisting on their personal preferences. However, data regarding this presumption are lacking. To this end, we evaluated the degree to which decisions made by selectively chosen representatives reflected the opinion of the group they are supposed to be representing. We also evaluated if the decisions of randomly selected representatives reflected the views of their peers and if the professionals working environment affects the representation of their peers, comparing gynecologists working in a moderate-to-large-team hospital setting with midwives working in small-to-single private practices.

Methods

Participants

Between 2013 and 2016 a total of 137 professionals participated in our inter-professional guideline development project, in the catchment area of the tertiary Maastricht University Medical Centre, the Netherlands. The participants included gynaecologists working in moderate-to-large-team hospital teams, midwives working in small-to-single first line practices and professionals working in maternity care. They were either assigned to the group of chosen representatives ($n = 23$) or to the group of peers ($n = 114$). The group of representatives included 10 gynecologists, 11 midwives and 2 maternity care board members. The group of peers included 31 gynecologists, 79 midwives and 4 peers working in maternity care, a distribution that accurately reflects the distribution in the field. Because status, expertise and working experience in years differed between representatives, an equal number of midwives and gynecologists in the representation group were selected to ensure an equal distribution from the same layer of the status hierarchy. We excluded the in total six professionals working in maternity care, because this group was too small to compare statement scores between representatives and peers. Representatives

were selectively chosen by their peers in different ways: anonymous voting, public voting or because they stepped forward to take the responsibility of representing their peers. The randomly selected representatives were selected by using an online random number generator.

Design

A four-step bottom-up approach was used to decide upon a wide range of obstetric topics that lead to uniform work-agreements. In the first step, current guidelines were summarized, inconsistencies were highlighted and pivotal questions formulated. Secondly, on essential topics a flowchart was created which showed different options on which a decision should be taken. Thirdly, after translation of these decision points into statements the participants ranked these statements ($n = 681$) by their level of agreement on a 1 (disagree) to 10 (agree) Likert-scale in an online survey (Survey Monkey, Palo, Alto, CA, USA). Representatives ranked the statements based on their own professional opinion. Each participant's vote counted equally. Finally, representatives formulated decisions and recommendations for daily practice after discussion of statements based on the mean and standard deviation (SD). Statement scores between 3 and 8 or a $SD > 2$ were discussed. Statements with a mean below 3 or above 8 and a $SD < 2$ were immediately rejected or accepted, respectively. Decisions were agreed upon when at least 85% of the representatives were in favour. No veto rights were allowed. After each meeting the representatives were responsible for reporting the final recommendations to their peers. We used the ranking score of each statement in the comparisons, correlations and level of agreement scores of representatives and peers. All agreements, scores and arguments used and weighted to come to certain decisions in case of discussion, were systematically documented and added to the final guideline to inform peers regarding the decision process.

Statistical analysis

Correlations between the scores of the representative and his/her peers were analyzed. We compared the statement scores of specifically chosen and randomly selected representatives (gynecologists and midwives) with the peers they were representing. The Bland-Altman method was used to analyze the data and determine the extent of correlation between those representatives and those they are representing. Scores were plotted against the average of the difference in a Bland-Altman plot [4]. Differences in opinion are illustrated by displaying the

average cumulative percentage (y-axis) of differences in statement scores (x-axis). The average level of agreement was presented by the area under the curve (AUC) of the difference in statement score and cumulative prevalence. The level of agreement was considered poor (AUC < 50%), moderate (AUC 50-69%), good (AUC 70-90%) or excellent (AUC > 90%). Analyses were performed using SPSS version 21.0, property of IBM. Graphs were created using SPSS and Microsoft® Excel (2010) both supplied by Maastricht University.

Results

Statement means of chosen representatives, both gynecologists and midwives, and their peers correlated well ($r = 0.91$) (Figure 1).

Figure 1: Scatter plot of statement means of the representatives (x-axis) versus their peers (y-axis) and a 95% confidence interval.

Differences in opinion are illustrated by displaying the average cumulative percentage (y-axis) of differences in statement scores (x-axis). In figure 2, the average differences in statement scores between the selected representatives and their peers are depicted for both gynecologists and midwives.

Figure 2: Cumulative percentage of differences in statement means between representatives and their peers. Four groups are visualized: randomly chosen gynecologists, randomly chosen midwives, specifically selected gynecologists and specifically selected midwives. The vertical lines show that in 50% of all scores the difference in mean score between the representatives and their peers is less than 1.9 point.

By view, the best representation is achieved by randomly selected gynecologists, with less than 1.3 point difference compared to their peers in 50% of the scores. For the other groups the percentage difference in statement scores is slightly higher; 1.5 point for selectively chosen gynecologic representatives, 1.7 point for randomly selected midwifery representatives and 1.9 point for selectively chosen midwifery representatives compared to their peers. Statistically, comparing the AUC used as a measure for agreement, no significant differences are seen between the four groups. Both, the selection method and the professional group did not statistically affect the level of agreement. The selectively chosen professionals (gyn AUC 0.77 vs. mid AUC 0.75, $p = 0.105$) showed the same levels of agreement, but randomly selected professionals (gyn AUC 0.80 vs. mid AUC 0.74, $p = 0.052$) tend to differ in professionals view and opinion. No significant differences were seen comparing both professional groups: gynecologists (selectively AUC 0.77 vs. random AUC 0.80, $p = 0.220$) and midwives (selectively AUC 0.75 vs. random AUC 0.74, $p = 0.859$).

The Bland-Altman plot (Figure 3) shows the agreement between the selectively chosen representatives and their peers on specific topics. The mean difference across all valued statements is 0.195 (upper limit 1.973, -1.583 lower

limit), indicating that most opinions are scored within a $\pm 18\%$ radius of each other.

Figure 3: Bland-Altman plot showing the agreement between representatives and their peers. The mean of the difference is 0.195 (upper limit 1.973, -1.583 lower limit).

Discussion

To come to inter-professional guidelines, usually a small group of representatives develops these directives. We evaluated if decisions made by chosen or randomly selected representatives working in different professional settings reflect the opinion of their constituency. We observed comparable levels of representative-peer agreement (AUC 0.74-0.80, 74-80%) in selected and randomly chosen representatives irrespective of their professional setting. This can be looked at in at least two ways: on the one hand, 74%-80% concordance suggests a high level of agreement, but on the other hand representatives and peers disagreed on 20-26% of statements, a not insignificant number, especially when fundamental issues are at stake. If the statements that are not agreed upon are critically important, the level of satisfaction with the process may be low, in spite of otherwise high levels of agreement. Level of agreement alone is therefore insufficient to guarantee satisfied participants. Participants must also agree that they will support the decisions made by this process and they must be willing to implement new policies in daily practice, even when the ultimate decision does not correspond with their personal preference.

Reaching unanimous agreement in group decisions

is rarely possible, particularly when the topic to be decided upon is multifaceted and when the decision affects participants' daily practice. Several social factors influence group decision-making and group- interaction. Individuals adjust their behavior to what they perceive is the group norm [2]. This phenomenon helps to explain the differences between the results of the surveys, filled in individually, and the final decisions after group discussion. Positively, in mutual respectful collaboration, individuals usually combine their preferences to create a shared decision, also known as social decision schemes [2]. Negatively, expressing views and perspectives in a multidisciplinary group may also lead to group polarization. This can result in merging of ideas which favor the dominant viewpoint [5]. Individuals can be docile and inclined to follow a dominantly held view, especially if this originates from an influential person. This can lead to false agreement. These dominant views can stem from individuals with a certain status and/ or expertise. Difference in status between individuals in the group is an important factor that contributes to conformity but also to compliance. One's status can have an effect on the consideration of evidence but also on the time spent discussing a certain topic within a group [2]. Besides status, expertise on a specific topic can influence the group decision [5]. If a group member with a recognized expertise expresses an opinion, this can persuade group members to follow and share this opinion. Recognizing that status, expertise and years of work experience differed between representatives, wanting to reduce social influence pressure; we chose to have an equal number of representatives from midwives and gynecologists, creating an equal distribution from the same layer of the status hierarchy. We also had an independent meeting chair tasked with monitoring all representatives' opinions, especially those not given in the discussion process [2].

Deciding who acts as a representative can be a challenge. As our results show, the differences in level of agreement are negligible between selectively chosen or randomly selected representatives. The selectively chosen professionals showed the same levels of agreement with their electorate. In our study, each region chose their representatives differently. Some were put forward by their peers to represent them, whereas others were anonymously chosen by voting or offered themselves to represent their peers. As a result, the representatives may have totally different characters that may vary from active participation only when specifically asked to do so, to continuous active participation and persuasive

presence. As social decision schemes may lead to conformity and with it more extreme choices made, the representatives' personality could affect an ultimate outcome and decisions made that may not reflect the mainstream opinion. Continuous feedback to the peers of what was decided for what reasons remains therefore of utmost importance.

Limitations

A potential limitation of this study is the fact that participants ranked statements differently. Even though statements were to be ranked on a gradient, some participants ranked the statements dichotomously (10 or 1). This likely resulted in larger differences between representatives and peers and as a consequence in a decreased representativeness. Despite these differences in ranking, the representatives reached a strong level of agreement.

Secondly, in our analysis, we did not weigh fundamental versus non-fundamental issues. Despite the good level of agreement of the chosen approach to come to agreement, the electorate might value taken decisions as not-representative to their opinion in case fundamental issues differ about 20% from their opinion.

Conclusion

Within a diverse group of professionals across disciplines, decision making by representatives largely reflects the opinion of the group they represent. The selection method of the representatives does not statistically affect the level of agreement between representatives and the group represented, although selectively chosen representatives may be most reflective to the group they stand for.

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