

## **Do we agree? Using a Delphi technique to develop consensus on skills of hand expression**

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### **Abstract**

The Delphi technique provides a structured process for collecting and examining group agreement on a topic. It facilitates anonymity and thus reduces the risk of stronger members dominating the group discussion, and allows geographical spread of the participants as well as low cost and timely return. This article describes the use of Delphi to examine agreement and lack of agreement among an expert panel on what are the skills that a mother needs to learn for hand expression. A Delphi technique can be used for a variety of topics and participants.

### **Introduction**

New mothers need to acquire skills related to breastfeeding, and when their society does not provide women with informal opportunities for learning these skills, health workers have a role in assisting this learning. One of these skills is hand expression. A wide variety of leaflets and other materials exist explaining how to hand express based on personal viewpoints; however there were no published data found to indicate agreement on the skills or knowledge that a mother needs in order to hand express effectively. New mothers frequently cite conflicting information as a major stressor, and gaining agreement on the core skills of hand expression may reduce some of the conflicting information. Therefore, original research was carried out to establish what skills were considered necessary for mothers to have, as a prerequisite to developing an informed list to use to assess performance of health workers in assisting a mother to learn these skills. This article reports on one aspect of this research.

#### *Techniques for consensus development*

Discussion can explore concepts and gain agreement. Formal methods of consensus development include the Delphi technique, nominal group technique (NGT) and consensus development conference<sup>1</sup>. These methods can be used in decision-making, policy development, estimate unknown effects, set priorities, develop criteria, synthesise professional norms, and identify areas where there is uncertainty, disagreement, or lack of evidence. The NGT, consensus development conference, and focus groups may provide insights, but require the people to be together. This may risk biasing input from people in one geographic area or from those who have the time and money to travel. The Delphi technique can be used without face-to-face contact, facilitating a wider group of participants. It is a structured process in which panel members individually respond to statements, and a system of repeated rounds providing feedback of information and iteration is used with the aim of achieving consensus.

The Delphi technique is based on the idea that several people are less likely to arrive at a wrong conclusion than a single individual is. Choosing participants who are knowledgeable and interested in the topic, and the repeated rounds, help to increase the validity, or strength, of the conclusions drawn from the findings. However, the Delphi technique does not create new knowledge and it may reinforce inaccurate knowledge if that is the knowledge of those consulted. The lack of face-to-face discussion means the reasons for disagreements cannot be debated, which may result in lack of agreement. Similar to other methods of consensus development, due care needs to be taken in the choice of the expert participants, development of statements, methods of analysis and determination of consensus, to avoid bias and misrepresentation.

### *What is agreement and consensus?*

Consensus methods do not aim to force the participants to come to an agreed conclusion; it is a means of seeing if the agreement exists or not. The term “agreement” or “consensus” can be determined both within each Delphi round and between rounds<sup>2-4</sup>. Two types of agreement occur within each Delphi round and for each individual statement. Firstly, the agreement of the individual participant with the statement, which then provides the group opinion or central tendency; usually measured by the group mean or median. Secondly, the extent that the participants agree with each other, typically measured by the spread or range. However, the stability of the response to a statement between rounds is also important, and can contribute to the quality and reliability of the conclusion. The degree of stability can indicate if the agreement was there throughout, if it developed during the Delphi process, and if it changed between rounds. The repeated consideration of the statements, which is fundamental to the Delphi process, allows the participants opportunity to reflect on their responses and to take into account the views of the others in the panel, and assists in developing stability of response.

This paper examines the use of the Delphi technique and explores the movement towards consensus on the skills of hand expression. The nature of the consensus of the skills to learn were briefly described elsewhere<sup>5</sup>.

## **Methods**

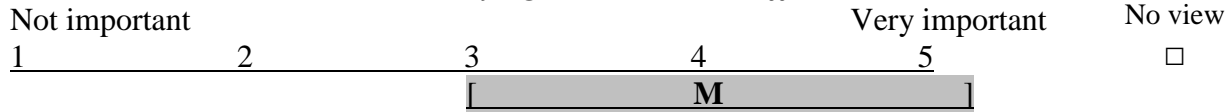
### *Study design*

A three-round Delphi process was used. In Round One, participants completed an idea-generating open statement with no limit to the number of ideas. Similar replies were identified and condensed as needed to produce a set of statements. For Round Two, these statements were sent for rating on a scale with 1 indicating “not important” and 5 indicating “very important” with regard to completing the statement: “*In order to hand express, a mother needs to...*”. A separate category of “no view” and a space for comments was also provided for each statement. Round Two responses were analysed on their return using SPSS (Version 12 and 14).

For Round Three, the same set of statements was sent again for rating. This round had the median (value of the middle item of a distribution) and inter-quartile range (the middle two quarters of the range of values) visually presented to the participants. (*Figure 1*) Comments added by the participants during Round Two were included with the statement that the comment referred to. On their return, these Round Three responses were analysed and explored.

**Figure 1: Example of statement sent for rating on Round Three**

***3.20 In order to hand express, a mother needs to know how to find the lactiferous sinuses/ducts/area where the underlying breast tissue is different.***



M=median of the responses from Round Two

Shaded area = inter-quartile range of the responses from Round Two

*Subject selection criteria*

Participants were purposely recruited from a lactation educators’ network, known contacts with particular interest or expertise in assisting learning of hand expression, authors of published referenced material on the topic (in English), with capacity and willingness to contribute to the exploration, time available, access by email, and ability to communicate in English. Because a number of the possible participants had published material (books, leaflets, video, articles) on the topic, some on a commercial basis, there was potential for bias of these respondents towards their own material. This needed to be balanced with the need to include participants who are interested in the topic and motivated to complete the Delphi process<sup>6</sup>. The geographic spread of the respondents included Europe, Americas and Australia. Though it would be enlightening to study the beliefs and methods of hand expression in Africa and Asia and in non-English speaking countries, they were not included in this study due to perceived difficulties in accessing panel members, translation issues, the cultural and practice issues regarding expression in countries with very different societies, and the difference in educational materials.

Potential members of the panel were approached to participate in the Delphi via an email that explained the purpose of the study, the process and the amount of time estimated. The panel were all free-living health professionals informed of the purpose and process of the research project; all contact was via email that facilitated not replying if they chose; and no harm was likely to the panel if they responded or did not respond. Responses were confidential, with identification numbers used and contact details stored separately to identification numbers. Agreeing to participate was taken as informed consent. As this research project did not involve patients of the National Health Service or students of the university, a formal ethical review process was not required by the university.

**Results**

Twenty-six people were initially approached to participate in the Delphi process and 23 agreed, with 21 completing all the rounds. The majority of the respondents were International Board Certified Lactation Consultants (IBCLC) who had worked in breastfeeding education of health workers for over 10 years, regularly assisted mothers with learning to hand express, and had published research or produced information, such as leaflets or videotapes, on hand expression (Figure 2).

**Figure 2: Demographics of Delphi participants (n=21)**

<b>Region:</b>	Europe (4 countries): 16	South Pacific: 2	
	Americas: 3		
<b>Worked in breastfeeding education of health workers:</b>	< 10 years: 3	10-25 years: 14	> 25 years: 4
<b>Taught health workers about hand expression (number of teaching sessions) :</b>	< 10 sessions/year: 6	10-25 sessions/year: 12	>25 sessions/year: 3
<b>Materials on hand expression:</b>	Research/peer-reviewed/professional article published on hand expression: 4		
	Produced staff information on hand expression: 13		
	Produced mother information on hand expression: 7		
	Produced other materials related to teaching hand expression: 3		
<b>Presented at a workshop/conference on hand expression:</b>			
<b>Health worker event:</b>	Major: 6	Local: 13	<b>Event for mothers: 7</b>
<b>IBCLC:</b>	Current: 14	Past certified but not current: 1	Never certified: 6
<b>Assist mothers with hand expression:</b>	< 10/month: 9	10-25 / month: 8	> 25 / month: 4

The Round One open question “*In order to hand express effectively, a mother needs to be able to do and/or to know the following: ...*” generated approximately 200 statements, which were sorted to identify similar responses and these similar responses combined, resulting in 49 statements to be rated in the following rounds by the 21 participants. Potentially, there could be 2184 responses in Round Two and Round Three. There were only 17 “blank” responses giving a response rate of 99% over these two rating rounds.

There are no recognised guidelines for determining a cut-off point in a Delphi process<sup>7</sup>. This study used a rating scale from 1 to 5. A group median of 3.25 was selected as the cut-off point for statements to be considered as “important” and 2.75 as “not important”, as being either side of the mid-point of the scale. The interquartile ranges (IQR) of 2 or less were taken to indicate consensus. A stable median across the rounds or a median that is moving to the outer points of the scale (towards 1 or 5) indicates a high level of group agreement for that statement, whereas a stable or narrowing interquartile range (IQR) over the Delphi rounds indicates agreement with each other (consensus).

Of these 49 statements to be rated, twenty-two statements had a stable median greater than 3.25 across both rating rounds, and an inter-quartile range (IQR) of 2 or less that was stable or narrowing, thus indicating group agreement with those statements as important for the mother to know or do. Eleven statements had a stable median of less than 2.75 across both rating rounds and a stable or narrowing IQR of 1 or less, thus indicating group agreement with those statements as not important for the mother to know or do. Six statements had a median of 3 and a

stable or narrowing IQR (of less than 1) across both rounds, indicating group agreement as neither important nor not important.

**Table 1: Changes between Delphi Rounds**

No. of statements (n=49)	Median movement between rounds	IQR change between rounds	Agreement
22	stable > 3.25	stable or narrowing <2	important
11	stable < 2.75	stable or narrowing <1	not important
6	stable >2.75 to < 3.25	stable or narrowing <1	neither important nor not important
5	unstable moving from 3 towards >2.75	narrowing <1	no
3	unstable from 4 towards 3	narrowing <1	no
1	unstable moving from 3 to 2	widening	no
1	unstable moving from 4 to 3	widening	no

Of the remaining ten statements, five statements had a median moving from 4 towards 3 and a narrowing IQR, three statements showed movement between rounds from a median of 3 towards 2 with a narrowing IQR, and two statements had a widening IQR as well as an unstable median.

As regards stability of individual respondents, all respondents changed their rating of at least two statements between Rounds Two and Three (including if they changed from no response or marking “no view” to marking a number); however, 73% of the changes were by one rating category or less. Most respondents made comments to at least one statement.

## Discussion

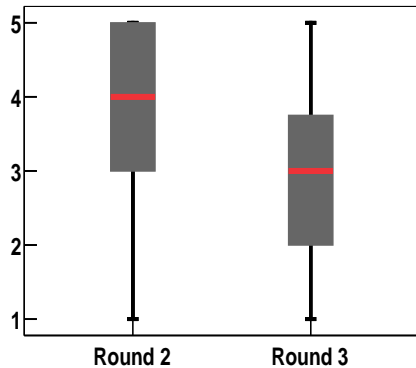
At the start of the Delphi rounds, some comments indicated a belief there was one way to teach hand expression and that this one way suited all mothers. By the end of the rounds, many of these respondents had moved to a “it depends on the individual situation and mother” view and emphasised the need for individualisation of the assistance. This short Delphi process, by offering another viewpoint to consider, appeared to change respondents’ views from a mechanical or behavioural stance to one that accepted individuality.

The respondents’ views may have changed because some respondents were less confident and changed to the majority viewpoint. However, the median response after Round Two and after Round Three remained the same or changed by less than one rating point for thirty-nine of the forty-nine statements (79.6%). This general stability of response implies the respondents were confident in their viewpoint even when presented with the group results and the other respondents’ comments, and it reflects the reliability of the agreement for these statements.

Respondents do change their views during the Delphi process and the change indicates the value of the iterative process. The statement that a mother needs to know where to find the lactiferous sinuses, (whose existence was a debated item in research at the time), provides an example regarding the effect of seeing opinions of other panel members and resultant changes in ratings and comments. Figure 3 and Table 2 show that although there was a wide range and similar spread (IQR), the median (group opinion) has shifted between Rounds. In the Delphi Round

Two, 11 of the 21 participants (52%) rated this statement as important, whereas after the feedback and comments, in Round Three only five participants (25%) still thought this was important. This movement could indicate that the respondents were influenced by the comments others made in Round Two, and that some respondents became less confident in their Round Two rating and changed it in Round Three.

**Figure 3: Change in rating of statement – lactiferous sinuses**



**Table 2: Statement – lactiferous sinuses**

Statement	Round 2	Round 3
Median	4	3
IQR	2	1.63
No. marking 1 to 2	5 (24%)*	6 (30%)*
No. marking >2 and <4	5 (24%)*	9 (45%)*
No. marking 4 to 5	11 (52%)*	5 (25%)*
No. not rating	0	1

\* % of those marking a rating

This level of diversity in a small group regarding the need for the mother to find the lactiferous sinuses may indicate similar mixed views in the wider body of those who assist mothers, and thus limit agreement on how to assist hand expression. In addition, it may highlight an area that could be researched further, namely exploring lactation consultants' acceptance and use of new research.

Some changes were inconsistent. The need for the mother to wash her hands well before expressing had a median of 4 in the first iterative round and 3 in the final round. Three respondents changed from a 5 to a 3; one respondent changed her rating from a 1 to a 3, and another changed from a 3 to a 5, thus indicating instability of agreement. This movement between rounds may reflect further consideration of the statement, or the inconsistency indicates that there might be need for more clarity related to why the individual mother is expressing. For example, was it milk for a preterm infant or a mother who was seeking relief from over-fullness and not intending to use the milk expressed?

Some studies using Delphi techniques have qualitatively examined the between-round comments taking a reduction in new comments for a statement as indicating convergence of opinion. Holey et al<sup>3</sup> suggest that the subjective views of outliers can raise important issues to be considered by the whole group and that the rounds should continue until these views are exhausted. However, the level of participant fatigue or the amount of time available may also determine the number of rounds<sup>8</sup>. In this hand expression study, an open round was followed by two rating rounds as it was not envisaged that a high number of rounds would achieve complete consensus due to the differing views known to be held. For example, for the hand washing statement, the median moved from 4 to 3 with a narrowing of the IQR, however some of the outliers did not change their rating, and their comments indicated little likelihood of change. It should be noted that all the statements had been put forward in Round One by at least one member of the group as important for the mother to know or to do in order to hand express, yet less than half of these

statements (45%) were finally agreed as important. If the Round One responses alone had been taken as the views of the group, as would be done with a basic questionnaire, the result would be quite different. The Delphi technique allows examination of the agreement for individuals between rounds, as well as group agreement.

This Delphi process via email provided an effective low cost way to involve participants who were geographically dispersed, and participants replied at a time that suited them, thus reducing participant burden. The anonymity facilitated freedom of expression without pressure to conform to a majority view or to the view of well-known participants, there was a structured interaction, and an explicit method of aggregating the respondents' views. The biggest challenge was for the respondents to remember to save their completed form before they emailed it back. Technology has progressed since this data collection and consideration could be given to using an on-line means of marking the forms that would also facilitate automatic generation of descriptive statistics to feed back to respondents, and to reduce data entry.

The Delphi technique has been used to develop curriculum and clinical guidelines, to agree standards of practice, and to set priorities for research or care in many other health professions<sup>9-13</sup>. It can be a valuable tool for the lactation consultant profession also.

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**Keywords -**

Delphi, research techniques, milk expression, lactation consultant