



A Canadian research agenda to improve South Asian patients' experience of knee replacement surgery: A patient-oriented modified Delphi study

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Abstract:	<p>Background: Up to 1-in-5 total knee arthroplasty (TKA) patients express dissatisfaction with the outcome of their surgery. Our goal was to understand the experiences/satisfaction of South Asian TKA patients, and to identify a Canadian research agenda for South Asian knee replacement patients.</p> <p>Methods: We undertook a mixed methods modified Delphi study in BC to generate and prioritize potential research topics. An initial list of topics was generated using three focus groups with South Asian TKA patients/caregivers. Focus groups were audio-taped, transcribed, and data analyzed using thematic analysis. The resulting Delphi questionnaire was administered over two rounds to South Asian TKA</p>

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	<p>patients/caregivers and health professionals. The Round 2 questionnaire only included topics 'strongly' supported by at least one stakeholder group. A patient-oriented approach was adopted, with 3 patient partners as full research team members, who contributed to scoping, design, data collection, analysis and interpretation.</p> <p>Results: 27 TKA patients/caregivers attended the focus groups. Our analyses resulted in six broad themes and 25 research topics, all of which were presented in the Round 1 Delphi survey. The survey was completed by 32 patients/caregivers (54% response) and 25 clinicians (76% response). Top priorities for both patients/caregivers and clinicians were: Promoting exercise following surgery and Self-management after hospital discharge. Improving knee implants, one of the highest ranked topics for patients/caregivers, was supported by only 60% of clinicians.</p> <p>Interpretation: Our findings point strongly to future research priorities for South Asian TKA patients on promotion of exercise and self-management following surgery, and improvement in knee implants.</p>

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A Canadian research agenda to improve South Asian patients' experience of knee replacement surgery: A patient-oriented modified Delphi study

GRIPP2 short form

Section and topic	Item	Reported on page No
1: Aim	Report the aim of PPI in the study	P5, L1-2
2: Methods	Provide a clear description of the methods used for PPI in the study	P8, L6-10
3: Study results	Outcomes—Report the results of PPI in the study, including both positive and negative outcomes	N/A
4: Discussion and conclusions	Outcomes—Comment on the extent to which PPI influenced the study overall. Describe positive and negative effects	P12, L8-15
5: Reflections/critical perspective	Comment critically on the study, reflecting on the things that went well and those that did not, so others can learn from this experience	P12, L17-23

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A Canadian research agenda to improve South Asian patients' experience of knee replacement surgery: A patient-oriented modified Delphi study

Confidential

Abstract

Background: Up to 1-in-5 total knee arthroplasty (TKA) patients express dissatisfaction with the outcome of their surgery. Our goal was to understand the experiences/satisfaction of South Asian TKA patients, and to identify a Canadian research agenda for South Asian knee replacement patients.

Methods: We undertook a modified Delphi study in BC to generate and prioritize potential research topics. An initial list of topics was generated using three focus groups with South Asian TKA patients/caregivers. Focus groups were audio-taped, transcribed, and data analyzed using thematic analysis. The resulting Delphi questionnaire was administered over two rounds to South Asian TKA patients/caregivers and health professionals. The Round 2 questionnaire only included topics 'strongly' supported by at least one stakeholder group. A patient-oriented approach was adopted, with 3 patient partners as full research team members, who contributed to scoping, design, data collection, analysis and interpretation.

Results: 27 TKA patients/caregivers attended the focus groups. Our analyses resulted in six broad themes and 25 research topics, all of which were presented in the Round 1 Delphi survey. The survey was completed by 32 patients/caregivers (54% response) and 25 clinicians (76% response). Top priorities for both patients/caregivers and clinicians were: *Promoting exercise following surgery* and *Self-management after hospital discharge*. *Improving knee implants*, one of the highest ranked topics for patients/caregivers, was supported by only 60% of clinicians.

Interpretation: Our findings point strongly to future research priorities for South Asian TKA patients on promotion of exercise and self-management following surgery, and improvement in knee implants.

1 Plain Language Summary

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6 3 As many as 20% of patients who have received a total knee replacement (TKR) are not satisfied with the
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8 4 outcome of their surgery. We need a better understanding of patient experiences and satisfaction with
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10 5 TKR, including a better understanding of differences by ethnic groups. Our team focused on understanding
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12 6 the experiences/satisfaction of South Asian TKR patients as South Asians are also the largest visible
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14 7 minority group in Canada. Our team included university-based researchers, TKR patients, health
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16 8 professionals, and policy-makers. Multiple team members were South Asian and/or provided care for
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18 9 South Asian TKR patients. We used group discussions with South Asian TKR patients and caregivers to
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20 10 identify areas for future research. These potential research topics were then ranked by South Asian TKR
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22 11 patients/caregivers and health professionals who provided care for South Asian TKR patients. This ranking
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24 12 was done using two surveys, with the second survey providing only those topics with the most support and
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26 13 information about others' answers. Top priorities for both patients/caregivers and health professionals
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28 14 were: *Promoting exercise following surgery* and *Self-management after hospital discharge*. The third
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30 15 highest ranked topic for patients/caregivers was *Improving knee implants*. This topic was not as highly
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32 16 supported by health professionals. Having patients as research team members also strengthened our study
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34 17 in multiple ways. Our study's findings point strongly to future research priorities for South Asian TKR
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36 18 patients on promotion of exercise and self-management following surgery, and improvement in knee
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1 Introduction

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6 Knee replacement surgery, or total knee arthroplasty (TKA), is one of the highest volume surgeries in
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8 Canada (1), and is widely recognized as an effective intervention for many patients. Whilst most TKA
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10 patients report high levels of satisfaction, a commonly cited and troubling statistic is that up to 1-in-5
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12 patients express dissatisfaction with the outcome of surgery (2, 3). Drivers of such dissatisfaction include
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14 knee-related factors (e.g., ongoing pain), failure to meet pre-surgery expectations, complications, and pain
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16 catastrophizing (2, 4-14). In our previous mixed methods research we highlighted key challenges such as
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18 post-surgery support needs not being met, (15), and ongoing health limitations (16). Our earlier work
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20 offered new insights, especially in relation to the importance of support needs. However, a major limitation
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22 of our earlier TKA research is the limited ethnic diversity in the patient sample, preventing us from
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24 exploring variation in satisfaction by ethnicity. This topic has not been widely investigated by other
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26 researchers. However, if we are to deliver truly person-centered care, understanding how care experience
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28 varies by ethnic background is critical. Such a desire motivated the work we report in this paper, where our
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30 focus is, in a Canadian context, the experience of South Asian knee replacement patients.
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37 The Canadian South Asian community (typically thought to include people from India, Pakistan, Sri Lanka
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39 and Bangladesh) is the largest visible minority group in Canada (17). There is emerging evidence suggesting
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41 that South Asian patients' need for TKA surgery is different from other groups in Canada, and yet their
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43 experience with the procedure is equally mixed. For example, Gandhi *et al* found that, compared to
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45 Caucasian patients, South Asians presented at a younger age, had greater pre-surgery functional disability
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47 and pain, and had a stronger perception of surgical risk (18, 19). The same team, however, also found that
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49 ethnicity was not predictive of a poorer functional outcome post-surgery, with both South Asians and
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51 Caucasians having similar levels of post-surgery function and pain. Our project's goal was to understand the
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53 experiences and satisfaction of South Asian TKA patients, with a view to identifying a South Asian patient-
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55 oriented research agenda for TKA in Canada. We were guided by the principles underlying Canada's
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1 Strategy for Patient-Oriented Research (SPOR), with its emphasis on collaborative engagement of patients,
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4 researchers and clinicians in seeking to identify important research topics.

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8 **Methods**

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12 *Study design*

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17 8 We employed a modified Delphi process to develop a ranked list of potential research topics aimed at
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19 9 improving South Asian patients' experience of and satisfaction after TKA. The Delphi technique is widely
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21 10 used in health research to establish consensus amongst subject experts through multiple survey rounds
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23 11 (20). In contrast to a traditional Delphi process, we used focus groups to generate the initial list of potential
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25 12 research topics (20, 21). Further, we only employed two survey rounds, to avoid participant fatigue (22).
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27 13 The study took place in British Columbia, Canada.

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32 *Study participants*

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37 17 Study participants included South Asian TKA patients or their caregivers, and health professionals. Patients
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39 18 and caregivers participated in the focus groups and the Delphi survey; health professionals participated in
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41 19 the Delphi survey only. Eligible patients had to have had TKA surgery for osteoarthritis in Canada in the
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43 20 previous two years, be over 19 years of age, have South Asian ancestral roots, and be able to converse in
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45 21 English and/or Punjabi. If an eligible patient was unwilling to participate, we invited the patient's caregiver.
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47 22 Health care professionals included physiotherapists, orthopaedic surgeons, primary care physicians,
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49 23 orthopaedic nurses and occupational therapists who self-identified as providing care for South Asian TKA
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51 24 patients.

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1 We conducted three focus groups, with 6 to 10 patients/caregivers in each [21]. The target sample size for
2
3 the Delphi survey was 25-40 patients/caregivers and 15-20 clinicians (20). Patients and their caregivers
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5 were recruited through community outreach, health system contacts and word-of-mouth. Where possible
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7 we sought diversity in terms of gender and age.
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12 With the support of our research team's patient partners, we identified potential participation barriers
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14 and, where possible, overcame them. For example, approaches were made outside of work hours,
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16 transportation challenges were considered, participant language and literacy issues were accommodated,
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18 and caregiver/family responsibilities were recognized. Focus groups also occurred in multiple locations to
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20 facilitate participation. Health professionals were recruited through research team contacts.
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23 24 25 26 *Focus groups: Data collection and analysis* 27 28 29

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31 Three focus groups were held in July and August 2017. Two focus groups were conducted in Pujabi and one
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33 in both 'Hinglish' (Hindi-English) and Punjabi. Experienced multi-lingual facilitators moderated each group.
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35 Participants were asked to reflect on their entire TKA experience, from diagnosis to long-term outcomes.
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37 Discussion topics were open-ended with a focus group guide followed to ensure consistency across groups
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39 (Appendix A). As part of the group process, and to verify accuracy, the facilitator paraphrased some
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41 discussions. At the end of each focus group, the facilitator and a note-taker wrote up detailed notes. Each
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43 focus group lasted approximately 2 hours and all participants received a small honorarium and
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45 reimbursement of costs.
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51 All focus groups were audio-taped and transcribed. To protect participant identities, all names were
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53 removed from transcripts. Data were analyzed using a thematic analysis approach (23, 24), with the aim of
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55 identifying future research topics. Using NVivo 10, two members of the research team (LG, NS) created the
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57 initial coding framework using line-by-line coding and a combination of independent and consensus work
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(25). The resulting themes and associated quotes were discussed at a full research team meeting (including our team's patient partners) followed by consensus work to distill the research topics for use in the first round Delphi survey. This multi-faceted approach helped ensure analytic rigour (26, 27). Our patient partners and others on the research team further reviewed the final list of topics to ensure appropriateness of language and framing.

Delphi survey: Data collection and analysis

In the first round of the survey, participants were asked to rate all potential research topics presented using a 5-point scale (ranging from 'Essential' to 'Unimportant'), with opportunity for comments and suggested additional topics.

In survey round 2, participants were again asked to indicate the importance of each topic using the same 5-point scale. The topics included in round 2 consisted of those from round 1 which received "strong support" from either patients/caregivers or clinicians. For retention of a topic in round 2, "strong support" was defined as $\geq 70\%$ of patient/caregivers or clinicians identifying the topic as "Essential" or "Very Important". This threshold is commonly applied in Delphi studies.

For each topic presented in round 2, participants were also given the distribution of round 1 responses, combined for patients/caregivers and clinicians, and a reminder of their own round 1 response (Figure 1).

In round 2, participants could either change their response from the previous round or retain their earlier response.

Prior to launch, the Delphi survey was piloted by patient partners and other study team members. In the main survey, participants had the option of completing an electronic survey in English or a postal survey in English or Punjabi. The Delphi survey was conducted between March and May 2018, with three weeks

1 between the two rounds. Participants received a small honorarium at the end of the round 2. We
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3 recognized that the Delphi exercise was likely to be challenging for some patient/carer participants, given
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5 language and literacy difficulties. Therefore, as a reminder and to answer questions, all participants were
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7 called in advance of receiving the survey, and again a few days after receipt.
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10 11 12 *Patient engagement* 13

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17 In addition to researchers and clinicians, we included three patient partners as full members of our
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19 research team, who contributed to study scoping and design, data collection, data analysis and
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21 interpretation, and knowledge translation.
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23 24 25 26 *Ethics approval* 27

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30 Prior to subject recruitment and data collection, we received harmonized institutional review board
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32 approval (ref: H17-01067). All participants provided informed consent.
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35 36 37 **Results** 38

39 40 41 *Focus groups* 42

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46 Fifty-one TKA patients/caregivers were identified, of whom 47 (92%) were deemed eligible, 39 (83%)
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48 consented to participate, and 27 (57%) attended a focus group (21 patients, 6 caregivers). Of the 27
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50 participants, 19 (70%) were female, their age varied from 50 to 93 years, and all originated from India and
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52 had lived in Canada for over 10 years. The thematic analysis revealed six broad themes and the 25 research
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54 topics under these main themes (Table 1).
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1 1 *Modified Delphi survey*

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5 3 A total of 59 patients/caregivers and 33 clinicians agreed to participate in the survey, with 36 (61%) and 27
6 4 (82%) respectively completing the round 1 survey (Table 2). Round 2 was administered to round 1
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8 5 respondents only, with 32 (89%) patients/caregivers and 25 (93%) clinicians completing round 2. Across
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10 6 both rounds, all responding clinicians used the online survey, while 67% of patients/caregivers chose the
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12 7 postal survey.
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19 9 Table 2 shows the characteristics of the Delphi panel (from round 1). The patient/caregiver panel members
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21 10 were predominantly female, over 60 years of age and not working. The clinician sub-panel comprised 7
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23 11 surgeons, 8 physiotherapists, 8 primary care physicians, 3 occupational therapists and 1 orthopaedic nurse.
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25 12 Over 40% of clinicians were South Asian themselves.
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30 14 Using the “strong support” criteria, we saw 15 topics move through to round 2 (Table 3). In comparing
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32 15 responses between rounds 1 and 2, many respondents (67%) kept the same response across all questions,
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34 16 and where we did see a change, typically, this was an ‘upward’ shift (e.g., moving from “Important” to
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36 17 “Very Important”).
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41 19 Table 3 indicates the proportion of respondents indicating that the topic was either “Essential” or “Very
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43 20 Important” (i.e., “strong support”). For virtually all topics, the proportion of respondents, both
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45 21 patients/carers and clinicians, indicating strong support increased from rounds 1 to 2. For
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47 22 patients/caregivers, we see over 80% of respondents declaring strong support for all 15 topics, and a range
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49 23 of strong support across all topics of only 12.5%. There is much greater discrimination across topics on the
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51 24 part of clinicians, with only 7 topics having over 80% of respondents declaring strong support. The range of
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53 25 strong support by clinicians across all topics is 68%.
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1 From a patients/caregivers perspective, the highest level of endorsement, with 93% of respondents
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4 strongly supporting the topic, is seen for three topics:

- 5 3 ▪ *Promoting exercise following surgery*
- 6 4 ▪ *Physiotherapy after surgery*
- 7 5 ▪ *Patient understanding of surgery and aftercare*
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14 7 The highest level of support by clinicians (96%) is for two topics: *Promoting exercise following surgery* and
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17 8 *Lifestyle changes pre-surgery to improve recovery*.

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21 10 Review of the ranking of topics reveals some important similarities and differences between
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24 11 patients/caregivers and clinicians. One topic is indicated as a top priority for both patients/caregivers and
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26 12 clinicians: *Promoting exercises following surgery*. Of particular interest, one of the highest-ranking topics
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28 13 for patients/caregivers, *Improving knee implants*, was only supported by 64% of clinicians.

32 15 **Interpretation**

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37 17 Typically, research agenda-setting exercises exclude minority groups, thereby preventing identification of
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39 18 culturally specific topics. Our study is a response to such concerns. This research is, to the best of our
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41 19 knowledge, the first to explore TKA research priorities for South Asian patients, and demonstrates that
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43 20 research engagement, using a Delphi technique, is very feasible in this population. Patients/caregivers
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45 21 declared strong support for all 15 (round 2) research topics, whereas the responses by clinicians reveal
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47 22 much greater levels of discrimination. This is to be expected given that topic identification (focus groups)
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49 23 was intentionally restricted to patients/caregivers only, reflecting our desire to give preeminence to
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51 24 patient/carer voices in the foundational work. Strong clinician support tended to focus on topics
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55 25 emphasizing patient lifestyle/recovery, including exercise, self-management and post-surgical

1 physiotherapy. The one topic that features as a top priority for both stakeholder groups is *Promoting*
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4 2 *exercises following surgery.*

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8 4 The James Lind Alliance (JLA) has recently undertaken a UK-based research priority setting exercise on hip
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10 5 and knee replacement for osteoarthritis (28). It is important to note that their findings relate to a general
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12 6 clinical population, with no exploration by ethnic group or even by joint replaced – the priorities presented
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14 7 are combined for hip and knee replacement patients. Some of the JLA identified priorities (e.g., '*What is*
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16 8 *the most effective pre- and post-operative patient education support and advice for improving outcomes*
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18 9 *and satisfaction for people with OA following hip/ knee replacement?*') link to those identified in our work
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20 10 but tend to be broader and less specific. The JLA topics make no mention of exercise or lifestyle changes,
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22 11 and no reference to improving knee implants (i.e., kneeling/squatting concerns). Note that our earlier
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24 12 qualitative research highlighted the importance of functioning challenges post-surgery (15).
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30 14 In a very different context (i.e., developing child health research agenda), Manikam et al report a research
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32 15 prioritization exercise also involving South Asian families and health care professionals (29). Despite the
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34 16 very different clinical focus, their motivation matched ours: minority groups are often excluded from
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36 17 research priority setting exercises. In line with our findings, they conclude that, research agendas inclusive
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38 18 of perspectives of South Asian patients/families can be identified, particularly through community-engaged
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40 19 approaches using co-production methods.
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46 21 Reflecting on our shortcomings, the limited discrimination by patients/carers across topics is a concern. We
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48 22 see over 80% of patient/carer respondents declaring strong support for all topics, and a strong support
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50 23 range of only 12.5%. Contrast this with a range of strong support of 68% for clinicians. A ranking exercise,
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52 24 as opposed to a rating exercise, would likely have delivered more discrimination by patient/carer
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54 25 respondents but we steered away when reflecting on the greater cognitive challenge, and likely higher
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56 26 drop-out rate. A second limitation relates to the Delphi study design – round 2 participants were presented
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1 with the distribution of round 1 responses combined for both stakeholder groups. An alternative would
2 have been to present to stakeholder-specific distributions. Our design choice reflects a desire to build
3 consensus across both stakeholder groups. A further weakness is the relatively disappointing response by
4 the patients/carer group to the round 1 Delphi survey (63%). However, challenges exist for recruitment and
5 retention of research participants in any study and so, given the context of our work, we feel that the
6 recruitment/retention rates are satisfactory.

7
8 The adoption of a strong patient-oriented approach strengthened this research enormously. For example,
9 after discussions amongst key team members, including patient partners, the project commenced with a
10 half-day 'learning workshop', engaging all team members. This provided the opportunity for sharing of
11 South Asian culture insights by South Asian team members – a key learning opportunity for many on the
12 team with quite different heritage. Further, the session enabled sharing of general health research
13 processes, a review of our earlier research findings, and discussion of the project. This started the project
14 off on the "right footing", building a team culture of respect for all, and an appreciation of the value of the
15 contributions from all.

16
17 Patient partners also played a critical role in supporting the success of this project, through enhancing our
18 research process and methods. Some of this related to logistics, such as advising on patient recruitment
19 strategies. However, the contribution was more than logistical; we received input and direction from
20 patient partners in the key step in the project: moving from the focus group themes to articulation of the
21 Delphi survey topics. Our patient partners stepped up to pilot the draft Delphi survey. Their presence at
22 meetings and on regular calls served as a constant reminder to others on the team of why this project was
23 so important.

24
25 Our findings point strongly to future research, driven to improve South Asian knee replacement patients'
26 experience, giving priority to exercise promotion and self-management following surgery, and advancing

1 knee implant technology, especially in relation to kneeling and squatting. More broadly, our work
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3 demonstrates that health research agenda-setting exercises can and should include minority groups,
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5 including South Asian communities. Through the adoption of a strong patient orientation in the research,
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7 culturally specific research topics were uncovered and prioritized.
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Figure 1: Example Delphi question in Round 2

Research on information on lifestyle changes (e.g., weight loss, diet, exercise) to prevent or delay osteoarthritis

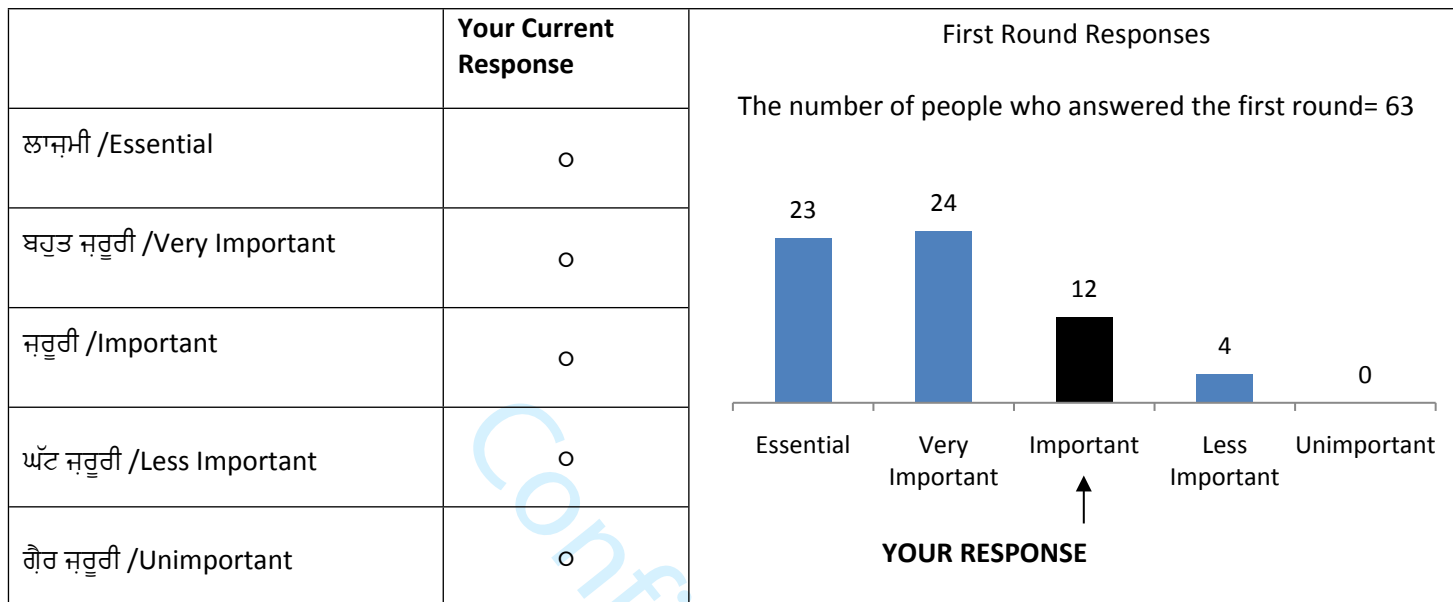


Table 1: Patient research priorities elicited from the focus group discussion

Research Theme	Research Topics
A: Avoiding knee replacement surgery	<p>Information on lifestyle changes (e.g., weight loss, diet, exercise) to prevent or delay osteoarthritis</p> <p>Improving other surgical techniques (e.g., arthroscopy) to avoid or delay need for knee replacement surgery</p> <p>Managing knee symptoms (e.g., use of pain medication) to avoid or delay need for knee replacement surgery</p>
B: Preparing for and deciding when to have knee replacement surgery	<p>Understanding differences between patient and surgeon views on the right time for knee replacement</p> <p>Improving wait times for surgery</p> <p>Effectively managing knee pain prior to surgery (e.g., medication, complementary and alternative medicine such as massage, homeopathy, diet)</p> <p>Information on lifestyle changes (e.g., weight loss, diet, exercise) before surgery to improve surgery recovery</p> <p>Improving patient understanding of what to expect during and after surgery</p> <p>Providing emotional and psychological support to patients before surgery from other patients</p> <p>Providing emotional and psychological support to patients before surgery from professional counsellors</p>
C: Knee implants	<p>Improving knee implants that allow for kneeling, squatting, and walking downhill</p>
D: Surgical cuts	<p>Improving surgical practices (e.g., stitching) for best healing and scar minimization</p> <p>Understanding the role of genetics in surgical scar formations</p>
E: Recovery in hospital	<p>Managing other illnesses while in hospital including medication interaction</p> <p>Promoting respectful behaviour between patients and clinicians in clinical settings</p> <p>Improving practices for physiotherapy after surgery</p> <p>Understanding differences between patient and the clinician views on the right time to discharge from the hospital</p> <p>Effectiveness of discharge to a rehabilitation hospital before being sent home</p>
F: Recovery Longer Term (i.e., After Hospital Discharge)	<p>Integrating family doctors into surgery recovery at the hospital and after discharge from hospital</p> <p>Exploring the best role of the surgeon after hospital discharge</p> <p>Effective use of pain medication after hospital discharge</p> <p>Effective support from the health care system post-surgery</p> <p>Effective self-management after hospital discharge</p> <p>Promoting exercises following surgery</p> <p>Providing effective support to patients with ongoing recovery problems</p>

Table 2: Survey participant characteristics

Patients and Caregivers: n=36		Clinicians: n=27	
Age grouping	n (%)	Sex	n (%)
≤ 50 years	2 (5.6)	female	13 (48.1)
51-60 years	1 (2.8)	male	14 (51.9)
61-70 years	17 (47.2)	Type of Practice	
71-80years	13 (36.1)	Orthopaedic Surgery	7 (25.9)
>81	3 (8.3)	Physiotherapy	8 (29.6)
Sex		Occupational Therapy	3 (11.1)
female	22 (61.1)	General Practice	8 (29.6)
male	14 (38.9)	Orthopaedic Nursing	1 (3.8)
Currently working		Ethnicity- South Asian?	
yes	13 (36.1)	no	15 (55.6)
no	23 (63.9)	yes	12 (44.4)
Education		Years providing care to South Asian TKA patients	
not a high school graduate	10 (27.8)	<5 years	7 (25.9)
high school graduate	10 (27.8)	6-10 years	3 (11.1)
college/technical school graduate	6 (16.7)	>10 years	17 (63.0)
university/undergraduate degree			
university graduate degree	7 (19.4)		
others (no education)	3 (8.3)		

Table 3: Delphi Responses for “Strong support” (‘Essential’ or ‘Very Important’), by Round and by Stakeholder Group

Research Topics	Round 1			Round 2		
	Patients/ Carers n=36 (61%)	Clinicians n=27 (82%)	Combined n=63 (69%)	Patients/ Carers n=32 (89%)	Clinicians n=25 (93%)	Combined n=57 (90%)
Information on lifestyle changes to prevent or delay osteoarthritis	25 (69.5%)	22 (81.4%)	47 (74.6%)	27 (84.4%)	23 (92.0%)	50 (87.7%)
Improving other surgical techniques to avoid or delay need for knee replacement surgery	28 (77.7%)	7 (25.9%)	35 (55.6%)	26 (81.3%)	7 (28.0%)	33 (57.9%)
Managing knee symptoms to avoid or delay need for knee replacement surgery	24 (66.6%)	18 (66.6%)	42 (66.7%)			
Understanding differences between patient and surgeon views on the right time for knee replacement	30 (83.3%)	18 (66.6%)	48 (76.2%)	29 (90.7%)	17 (68.0%)	46 (80.7%)
Improving wait times for surgery	27 (75.0%)	19 (70.3%)	46 (73.0%)	29 (90.7%)	18 (72.0%)	47 (82.5%)
Effectively managing knee pain prior to surgery	26 (72.2%)	18 (66.6%)	44 (69.8%)	27 (84.4%)	21 (84.0%)	48 (84.2%)
Information on lifestyle changes before surgery to improve surgery recovery	25 (69.4%)	23 (85.2%)	48 (76.2%)	28 (87.5%)	24 (96.0%)	52 (91.2%)
Improving patient understanding of what to expect during and after surgery	31 (86.1%)	22 (81.4%)	53 (84.1%)	30 (93.8%)	21 (84.0%)	51 (89.5%)
Providing emotional and psychological support to patients before surgery from other patients	20 (55.6%)	11 (40.7%)	31 (49.2%)			
Providing emotional and psychological support to patients before surgery from professional counsellors	18 (50.0%)	8 (29.6%)	26 (41.3%)			
Improving knee implants that allow for kneeling, squatting, and walking downhill	31 (86.1%)	17 (62.9%)	48 (76.2%)	29 (90.7%)	16 (64.0%)	45 (78.9%)
Improving surgical practices for best healing and scar minimization	25 (69.5%)	11 (40.7%)	36 (57.1%)			

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Understanding the role of genetics in surgical scar formations	20 (55.6%)	5 (18.5%)	25 (39.7%)			
Managing other illnesses while in hospital including medication interaction	25 (69.5%)	15 (55.5%)	40 (63.5%)			
Promoting respectful behaviour between patients and clinicians in clinical settings	21 (58.3%)	15 (55.5%)	36 (57.1%)			
Improving practices for physiotherapy after surgery	32 (88.9%)	23 (85.2%)	55 (87.3%)	30 (93.8%)	23 (92.0%)	53 (92.9%)
Understanding differences between patient and the clinician views on the right time to discharge from the hospital	24 (66.6%)	17 (62.9%)	41 (65.1%)			
Effectiveness of discharge to a rehabilitation hospital before being sent home	25 (69.5%)	11 (40.7%)	36 (57.1%)			
Integrating family doctors into surgery recovery at the hospital and after discharge from hospital	23 (63.9%)	13 (48.1%)	36 (57.1%)			
Exploring the best role of the surgeon after hospital discharge	33 (91.7%)	9 (33.3%)	42 (66.7%)	28 (87.6%)	9 (36.0%)	37 (64.9%)
Effective use of pain medication after hospital discharge	29 (80.6%)	22 (81.4%)	51 (80.9%)	28 (87.6%)	20 (80.0%)	48 (84.2%)
Effective support from the health care system post-surgery	32 (88.9%)	19 (70.3%)	51 (80.9%)	28 (87.6%)	19 (74.0%)	47 (82.5%)
Effective self-management after hospital discharge	31 (86.1%)	23 (85.2%)	54 (85.7%)	29 (90.7%)	23 (92.0%)	52 (91.2%)
Promoting exercises following surgery	33 (91.7%)	23 (85.2%)	56 (88.9%)	30 (93.8%)	24 (96.0%)	54 (94.7%)
Providing effective support to patients with ongoing recovery problems	27 (75.0%)	16 (59.2%)	43 (68.3%)	29 (90.7%)	15 (60.0%)	44 (77.2%)