

Development of the IcanSDM scale to assess primary care clinicians' ability to adopt shared decision-making

Anik Giguère (✉ anik.giguere@fmed.ulaval.ca)

Universite Laval <https://orcid.org/0000-0001-9928-7395>

Laura-Mihaela Bogza

Universite Laval

Laëtita Coudert

Universite Laval

Pierre-Hugues Carmichael

Universite Laval

Jean-Sébastien Renaud

Universite Laval

France Légaré

Universite Laval

Anja Lindig

Universitätsklinikum Hamburg-Eppendorf

Philippe Voyer

Universite Laval

Research note

Keywords: Patient-centered care, Physician-patient relation, Shared decision-making, Psychometric, Continuing professional development, Validation, Measurement, Validity

Posted Date: April 3rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-19647/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Objective: To support studies on the implementation of shared decision making (SDM), we sought to develop and validate the IcanSDM scale that assesses clinicians' perceptions of their ability to adopt SDM.

Results : An expert panel reviewed the literature on clinician-reported barriers to SDM adoption, to create an 11-item preliminary scale. A convenience sample of 16 clinicians from Québec (Canada) completed the IcanSDM and the Belief about capabilities subscale of the CPD-Reaction instrument (BCap), before and after SDM training. We audio-recorded their comments as they completed the scale. We measured IcanSDM's internal consistency, sensitivity to change and correlation with BCap. Partial correlation coefficients and item analyses suggested removing three items. In the 11-item IcanSDM version, three items lacked clarity or responsiveness, or showed negative partial correlations with the whole instrument. We thus removed these items. The revised 8-item version gave Cronbach's alphas of 0.63 before and 0.71 after training, and a 16% improvement in IcanSDM total score after training, compared to before training ($p < 0.0001$). We also found a significant correlation between IcanSDM and the BCap before training ($p = 0.02$), but not after ($p = 0.46$).

Introduction

Shared decision making (SDM) is a process whereby patients and clinicians collaborate to make choices about patient health.¹ During this journey, the clinician provides information on the options and research-based outcomes relevant to their health status, to ultimately help them clarify and incorporate their preferences and values into decision making.²⁻⁶ This approach can be facilitated by patient decision aids that have been shown to help improve patient knowledge, accuracy of risk perception, congruency between values and care choices, and satisfaction.⁷ Nevertheless, SDM is regularly overlooked during clinical encounters, or only partially used.⁸

While an ever growing number of countries are committing to delivering patient-centered care through SDM, implementation remains a challenge.⁹⁻¹¹ Despite the fact that clinicians mostly agree with the principles of SDM,¹² they still do not use it in their practice.⁸ To guide clinicians around and beyond the perceived barrier of SDM being difficult to put into use, several training programs in SDM are being implemented.¹³ Depending on the training program, some research findings report increased SDM after training.¹⁴

A recent systematic review appraised 40 scales to measure SDM processes.¹⁵ An earlier review also described the scales to measure decision antecedents and decision outcomes,¹⁶ revealing that the scales to assess decision antecedents targeted patients'-and not clinicians'- preparedness for decision making.¹⁶ To the best of our knowledge, there are no scales for evaluating clinicians' perceptions of the barriers to SDM, despite the fact that these perceptions are key determinants of SDM implementation.¹⁷

Among the diverse types of barriers to adopting SDM, clinicians consistently report time constraints^{17,18} or the lack of applicability to specific clinical situations or patients.¹⁸ A quantitative assessment of the extent to which clinicians perceive these barriers, would be helpful to identify potential training needs and assess the effectiveness of training, but such a tool does not yet appear to be available for SDM.¹⁹

We therefore sought to develop and validate a new scale, the IcanSDM scale to assess clinicians' perceptions of their ability to adopt SDM. IcanSDM is a self-report scale completed by clinicians. It may be used to evaluate the impacts of training or program implementation, or to help tailor these programs to maximize their impacts. IcanSDM is intended for clinicians of any profession working in any setting, as healthcare is increasingly provided by interprofessional teams.¹³

This paper presents the first steps taken to develop and validate this scale.

Methods

Study Design

This study included two steps: (1) item formulation, and (2) validation. It is a secondary study of a larger study to design and evaluate a professional e-learning program that is reported elsewhere.²⁰

Item Formulation

An expert panel (AMCG, EF-B, DC) developed a preliminary list of 11 items, in French, based on a review of the literature about the barriers perceived by clinicians to adopt SDM.^{17,18,21-28} The panel selected the barriers most often reported and wrote them as affirmative statements (Table 1). Respondents rated the degree to which they agreed with each statement on a visual analogue scale ranging from 0 (strongly disagree) to 10 (strongly agree). A total score on the IcanSDM scale can be calculated from the mean of its items, ranging from 0 to 10 with higher scores indicating higher barrier perception and thus lower ability to adopt SDM.

Table 1

IcanSDM items. The items were formulated in French. The English version is a translation that was not culturally adapted.

Retained items	
#1	Shared decision-making results in longer clinical encounters.
#2	Patients often prefer that the clinician make the decision.
#4	Shared decision-making does not apply to all patients, nor does it apply to all clinical situations.
#6	Communicating scientific data to patients is too complex.
#7	Shared decision-making takes up too many resources.
#8	Shared decision-making is inconsistent with clinical practice guidelines.
#9	Shared decision-making is just a passing trend.
#11	Initial: The shared decision-making process highlights the uncertainty associated with interventions. This could affect treatment adherence. Final: During shared decision-making, the patient becomes aware of the uncertainty associated with interventions and might become confused.
Discarded items	
#3	Often, patients have already made their decision.
#5	My team and I already use shared decision-making.
#10	With shared decision-making, I find that many of the interventions I recommend are less effective than I thought. I prefer to continue with my usual practice.

Validation

Study Participants

We recruited a sample of clinicians from various professions (e.g., physicians, nurses, social workers) who worked in family medicine clinics in rural regions of the Province of Québec (Canada). We presented the project during one of the scheduled clinical team meetings. Clinicians who were interested completed the informed consent document and a study entry questionnaire to assess their demographic and professional characteristics (age, profession, year of licensure).

Data Collection

Respondents answered electronic surveys before (t0) and after (t1) completion of the web-based training program on SDM. As this was done during a think-aloud session to assess the training program, we

recorded their comments as they completed IcanSDM, but did not prompt them to get their impressions of the items. We transcribed these comments verbatim.

The surveys included the IcanSDM and the Belief about capabilities subscale of the CPD-Reaction.

The CPD-Reaction questionnaire is meant to measure the determinants influencing adoption of a behaviour, namely intention, social influence, beliefs about capabilities, moral norm, and attitude/beliefs about consequence.²⁹⁻³¹ The present study reports exclusively the results of the Belief about Capabilities subscale of the CPD-Reaction, which reflect clinicians' general beliefs about their ability to adopt SDM, and comprises three items.

Similarly to the CPD-reaction, IcanSDM is also meant to measure beliefs about capabilities. However, it is more precise than the CPD-reaction as it allows measuring a set of salient beliefs underlying this determinant, as they have been extracted from the literature.

Analyses

Content validity and item analyses

We analyzed respondents' comments about each item as they completed the survey, looking for any mention of incomprehension and evaluating acceptance.

For each item, we also visually inspected the distribution of respondents' responses before and after training to explore each item's instructional sensitivity.

Internal consistency

We evaluated the scale's internal consistency using Cronbach's alpha coefficient for measurements made before and after exposure to e-TUDE.

We also checked item-wise consistency using partial correlation coefficients at both t0 and t1.

Sensitivity to change

We hypothesized that training primary care professionals in SDM would increase their perceived ability to adopt SDM, which should result in a lower score on the IcanSDM scale (i.e., fewer perceived barriers). To verify this hypothesis, we compared the means of participants' total scores before and after training using the paired Student's t test. We also visually compared the frequency distribution of answers to the pooled items before and after training.

Convergent validity

To evaluate the convergent validity, we calculated the Pearson's correlation coefficient (r) between the total score on the IcanSDM scale and the total score on the Belief about Capabilities subscale of the CPD-

Reaction. We expected a negative correlation between the two scales.

We conducted all statistical analyses with the SAS package version 9.4 (SAS Institute Inc., Cary, NC, USA). We set the statistical significance of all analyses at 0.05.

Results

Participant Characteristics

We recruited 16 primary clinicians. Of these, 75% were women and 75% were physicians. They had a mean age of 38 and an average of 10 years of practice (Table 2).

Table 2
 Characteristics of the participants in the Validation
 and Confirmation Steps of the study.

	Frequency (%) (Total N = 16)
Gender	
Female	12 (75%)
Age	
≤30	4 (25%)
30–39	6 (38%)
40–49	4 (25%)
50–59	2 (12.5%)
60–69	0 (0%)
Profession	
Physician	12 (75%)
Nurse	2 (12.5%)
Social worker	2 (12.5%)
Occupational therapist	0 (0%)
Pharmacist	0 (0%)
Physiotherapist	0 (0%)
Nutritionist	0 (0%)
Nursing assistant	0 (0%)
Years of practice	
≤10	6 (37.5%)
10–19	6 (37.5%)
20–29	4 (25%)
30–39	0 (0%)
Do not recall	0 (0%)
Area of practice	
Capitale-Nationale	0 (0%)

	Frequency (%) (Total N = 16)
Abitibi-Témiscamingue	1 (6%)
Gaspésie-Îles-de-la-Madeleine	7 (44%)
Lanaudière	7 (44%)
Centre-du-Québec	1 (6%)

Content validity and item Analyses

Analyses of participants' comments revealed that 7 of the 16 respondents (43%) did not understand item #10 (Supplement material 1). One person did not understand the item #11.

To analyze each item's instructional sensitivity, we did a visual inspection of the histograms of answers before and after clinicians' exposure to training (Supplement material 2). We first noticed that the frequency distribution of clinicians' answers to items #1, 2, 3, 4, 5, 8, 9, 10, and 11 shifted towards perceptions of increased ability to adopt SDM (towards 0) after training. In contrast, clinicians' answers to items #6 and 7 did not consistently demonstrate a positive impact of training, with a small proportion of respondents reporting a decreased ability to adopt SDM (ratings shifting towards 10) after training.

Internal Consistency

Internal consistency for the 11-item scale was low at t0, with a Cronbach's alpha of 0.19, and increased at t1 with a Cronbach's alpha of 0.57. Item-wise consistency, using partial correlation coefficients, revealed some problems with negative partial correlations for items #3 and 5 at both t0 and t1 (Supplement material 3). Items #10 and 11 also gave negative partial correlations, but only at t0.

These findings, as well as those of the previous qualitative item analysis, suggested removing items #3 (Often, patients have already made their decision), #5 (My team and I already use shared decision-making), and #10 (With shared decision-making, I find that many of the interventions I recommend are less effective than I thought. I prefer to continue with my usual practice) from IcanSDM.

We then re-analyzed our data after these changes, and obtained a Cronbach's alpha of 0.63 at t0, and 0.71 at t1 (Supplement material 4). Item-wise consistency also improved, though item #11 still presented a negative partial correlation at t0, which might indicate that the item is better understood after training.

We thus retained eight items for potential inclusion in IcanSDM. The item 11 was also reworded to improve understanding and to address the negative partial correlation described earlier. It was reworded from "The shared decision-making process highlights the uncertainty associated with interventions. This could affect treatment adherence." to "During shared decision-making, the patient becomes aware of the uncertainty associated with interventions and might become confused."

Sensitivity to Change

Before training, respondents reported a mean level of 2.70 (\pm SD 0.98) in their perceived barriers when items 3, 5 and 10 were excluded. After training, this level decreased to 2.25 (\pm SD 1.11), indicating a significant 16% decrease in their perceived barriers to adopt SDM ($p < 0.0001$). This shift between t0 and t1 is also apparent in the histogram depicting score distributions (Fig. 1).

Convergent Validity

We evaluated the correlation between the 8-item IcanSDM and the Belief about Capabilities subscale of the CPD-Reaction instrument. We observed a lack of correlation between the scales at t0 (Pearson's $r = -0.20$, $p = 0.46$) and a significant negative correlation between them at t1 (Pearson's $r = -0.59$, $p = 0.02$).

Discussion

We sought to develop and validate a new scale, the IcanSDM scale, to assess clinicians' perceptions of their ability to adopt SDM. During the course of this study, the scale was reduced from 11 to 8 items, and one item was reworded. The scale was found to be acceptable to users. Initial validation showed promise of the scale's ability to indicate impacts of a training program on SDM. Our results lead us to the following observations.

First, we found that internal consistency of the 8-item IcanSDM version was limited but acceptable, considering this is a new instrument with a limited number of items.³²⁻³⁴ Some experts recommend the alpha should be at least 0.90 for instruments used in clinical settings.³⁵ Others suggest an alpha of 0.70 is acceptable for a new instrument^{33,34} and that an alpha higher than 0.90 would indicate repetitive items.³²

Several scales have been designed to measure SDM processes, to assess decision antecedents in patients, decision outcomes or clinician competencies in SDM,^{15,16,36} or to evaluate the impact of SDM on patient health.³⁷ However, to the best of our knowledge, no tool, until IcanSDM, has been available to assess clinicians' perceived ability to adopt SDM, supporting the merits of further testing it. Next steps should comprise testing with a larger sample size that would allow factorial analysis, and a proper analysis of the scale's sensitivity to change. It would also be interesting to develop a complementary set of items for organizational/contextual barriers to help evaluate implementation efforts more thoroughly.

The strengths of this study lie in the rigorous application of scale development procedures³⁸ and the presence of convergent validity testing. The items were based on a review of barriers coming from a large worldwide dataset from diverse populations using various languages. We also evaluated the change in clinicians' perceptions before and after receiving training on SDM and we led a qualitative exploration of the limits in users' understanding of the items.

Conclusions

The IcanSDM scale assessing clinicians' clinical behavioral intentions concerning SDM showed promising validity and reliability, but further testing is required. To our knowledge, there is currently no tool to assess clinicians' perceived ability to adopt SDM, although the current research agenda is heavily invested in studying implementation of SDM.¹⁰ A quantitative measure of clinicians' perceived barriers is thus needed to help optimize interventions and to assess how our training programs influence clinicians' perceptions of these barriers.

Limitations

This study has some methodological limitations. First, there was no control group to measure IcanSDM's sensitivity to change. Second, the results were based on a small sample size; further testing with a greater number of users is needed to establish standards to govern the interpretation of results. Finally, the only scale found to test convergent validity—CPD-Reaction—has its own limitations including ceiling effects.³¹

Abbreviations

SDM

shared decision making

BCap

Belief about capabilities subscale of the CPD-Reaction instrument

Declarations

Ethics approval and consent to participate

We obtained ethical approval for this project from the Ethics Review Board of the *Ministre de la Santé et des Services Sociaux du Québec* (reference CCER15-16-05) and the *Centre Hospitalier Universitaire de Québec* (reference 2016-2521). All participants signed an informed consent prior to participation in the study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This project was funded by the *Ministère de l'Économie, de l'Innovation et de l'Exportation du Québec* and by the *Société de Valorisation (SOVAR)* (grant number 2014-2015-PSVT2-31494). We also received in-kind support from the Office of Education and Continuing Professional Development at Laval University and from University Laval Research Centre on Community-Based Primary Health Care (CERSSPL-UL). AMCG is funded by Research Scholar Junior 2 Career Development Award by the *Fonds de Recherche du Québec—Santé*. LB is funded by fellowship from the Canadian Institutes of Health Research. FL is funded by a Tier 1 Canadian Research Chair in Shared Decision Making and Knowledge Translation. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Authors' contributions

AMCG designed this study and led the expert panel in charge of creating the items list. AMCG and LC collected the data. AMCG, P-HC, JSR, LC, and LB analysed, and interpreted the data. AMCG, LC, and LB participated in the initial drafting of the manuscript. All authors drafted, critically revised and gave final approval of the article. AMCG acts as guarantor.

Acknowledgements

We would like to thank Émilie Fortier-Brochu (EF-B) and Danielle Caron (DC) for their participation as experts to the panel to formulate the items list. We would also like to acknowledge the contributions of Danielle Caron (DC) and Moulikatou Adouni Lawani to data collection and analysis. We also wish to thank Katherine Hastings for the writing assistance.

References

1. Barry MJ, Edgman-Levitan S. Shared decision making—pinnacle of patient-centered care. *N Engl J Med*. 2012;366(9):780-781. doi:10.1056/NEJMp1109283
2. Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: what does it mean? (or it takes at least two to tango). *Soc Sci Med*. 1997;44(5):681-692. doi:10.1016/S0277-9536(96)00221-3
3. Gwyn R, Elwyn G. When is a shared decision not (quite) a shared decision? Negotiating preferences in a general practice encounter. *Soc Sci Med*. 1999;49(4):437-447.
4. Edwards A, Elwyn G. Understanding risk and lessons for clinical risk communication about treatment preferences. *Qual Heal Care*. 2001;10 Suppl 1:i9-13. doi:10.1136/qhc.0100009
5. Elwyn G, Lloyd A, May C, et al. Collaborative deliberation: A model for patient care. *Patient Educ Couns*. 2014;97(2):158-164. doi:10.1016/j.pec.2014.07.027
6. Elwyn G, Dehlendorf C, Epstein RM, Marrin K, White J, Frosch DL. Shared decision making and motivational interviewing: achieving patient-centered care across the spectrum of health care

- problems. *Ann Fam Med*. 2014;12(3):270-275. doi:10.1370/afm.1615
7. Stacey D, Légaré F, Lewis K, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev*. 2017;4(4):CD001431. doi:10.1002/14651858.CD001431.pub5
 8. Couët N, Desroches S, Robitaille H, et al. Assessments of the extent to which health-care providers involve patients in decision making: A systematic review of studies using the OPTION instrument. *Heal Expect*. 2015;18(4):542-561. doi:10.1111/hex.12054
 9. Coulter A. Shared decision making: everyone wants it, so why isn't it happening? *World psychiatry*. 2017;16(2):117-118. doi:10.1002/wps.20407
 10. Härter M, Moumjid N, Cornuz J, Elwyn G, Weijden T van der, van der Weijden T. Shared decision making in 2017: International accomplishments in policy, research and implementation. *Z Evid Fortbild Qual Gesundhwes*. 2017;123-124:1-5. doi:10.1016/J.ZEFQ.2017.05.024
 11. National Health Service, Capita Group. *Measuring Shared Decision Making: A Review of Research Evidence*; 2012. http://www.rightcare.nhs.uk/wp-content/uploads/2012/12/Measuring_Shared_Decision_Making_Dec12.pdf.
 12. Lin GA, Halley M, Rendle KAS, et al. An Effort To Spread Decision Aids In Five California Primary Care Practices Yielded Low Distribution, Highlighting Hurdles. *Health Aff*. 2013;32(2):311-320. doi:10.1377/hlthaff.2012.1070
 13. Diouf NT, Menear M, Robitaille H, Painchaud Guérard G, Légaré F. Training health professionals in shared decision making: Update of an international environmental scan. *Patient Educ Couns*. 2016;99(11):1753-1758. doi:10.1016/j.pec.2016.06.008
 14. Légaré F, Adekpedjou R, Stacey D, et al. Interventions for increasing the use of shared decision making by healthcare professionals. *Cochrane database Syst Rev*. 2018;(7):CD006732. doi:10.1002/14651858.CD006732.pub4
 15. Gärtner FR, Bomhof-Roordink H, Smith IP, Scholl I, Stiggelbout AM, Pieterse AH. The quality of instruments to assess the process of shared decision making: A systematic review. *PLoS One*. 2018;13(2):e0191747. doi:10.1371/journal.pone.0191747
 16. Scholl I, Koelewijn-van Loon M, Sepucha K, et al. Measurement of shared decision-making - a review of instruments. *Z Evid Fortbild Qual Gesundhwes*. 2011;105(4):313-324. doi:10.1016/j.zefq.2011.04.012
 17. Légaré F, Witteman HO. Shared Decision Making: Examining Key Elements And Barriers To Adoption Into Routine Clinical Practice. *Health Aff*. 2013;32(2):276-284. doi:10.1377/hlthaff.2012.1078
 18. Légaré F, Ratté S, Gravel K, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: Update of a systematic review of health professionals' perceptions. *Patient Educ Couns*. 2008;73(3):526-535. doi:10.1016/j.pec.2008.07.018
 19. Müller E, Strukava A, Scholl I, et al. Strategies to evaluate healthcare provider trainings in shared decision-making (SDM): a systematic review of evaluation studies. *BMJ Open*. 2019;9(6):e026488. doi:10.1136/bmjopen-2018-026488

20. Lawani MA, Turgeon Y, Côté L, et al. User-centered and theory-based design of a professional training program on shared decision making with older adults living with neurocognitive disorders: a mixed-methods study. *Submitt to BMC Med Inf Decis Mak*.
21. Charles C, Gafni A, Whelan T. Self-reported use of shared decision-making among breast cancer specialists and perceived barriers and facilitators to implementing this approach. *Heal Expect*. 2004;7(4):338-348. doi:10.1111/j.1369-7625.2004.00299.x
22. Gravel K, Legare F, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: a systematic review of health professionals' perceptions. *Implement Sci*. 2006;1:16. doi:10.1186/1748-5908-1-16
23. Silvia KA, Ozanne EM, Sepucha KR. Implementing breast cancer decision aids in community sites: Barriers and resources. *Heal Expect*. 2008;11(1):46-53. doi:10.1111/j.1369-7625.2007.00477.x
24. Guerrier M, Legare F, Turcotte S, Labrecque M, Rivest LP. Shared Decision Making Does Not Influence Physicians against Clinical Practice Guidelines. *PLoS One*. 2013;8(4):e62537. doi:10.1371/journal.pone.0062537
25. Hofstede SN, Marang-van de Mheen PJ, Wentink MM, et al. Barriers and facilitators to implement shared decision making in multidisciplinary sciatica care: a qualitative study. *Implement Sci*. 2013;8:95. doi:10.1186/1748-5908-8-95
26. Legare F, Thompson-Leduc P. Twelve myths about shared decision making. *Patient Educ Couns*. 2014;96(3):281-286. doi:10.1016/j.pec.2014.06.014
27. Legare F, Stacey D, Forest PG, et al. Milestones, barriers and beacons: Shared decision making in Canada inches ahead. *Z Evid Fortbild Qual Gesundheitswes*. 2017;123-124:23-27. doi:10.1016/j.zefq.2017.05.020
28. Friedberg MW, Van Busum K, Wexler R, Bowen M, Schneider EC. A demonstration of shared decision making in primary care highlights barriers to adoption and potential remedies. *Heal Aff*. 2013;32(2):268-275. doi:10.1377/hlthaff.2012.1084
29. Legare F, Borduas F, Freitas A, et al. Development of a simple 12-item theory-based instrument to assess the impact of continuing professional development on clinical behavioral intentions. *PLoS One*. 2014;9(3):e91013. doi:10.1371/journal.pone.0091013
30. Godin G, Belanger-Gravel A, Eccles M, Grimshaw J. Healthcare professionals' intentions and behaviours: a systematic review of studies based on social cognitive theories. *Implement Sci*. 2008;3:36. doi:1748-5908-3-36 [pii] 10.1186/1748-5908-3-36
31. Légaré F, Freitas A, Turcotte S, et al. Responsiveness of a simple tool for assessing change in behavioral intention after continuing professional development activities. *PLoS One*. 2017;12(5):e0176678.
32. Streiner D. Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency. *J Pers Assess*. 2003;80(1):99-103. doi:10.1207/S15327752JPA8001_18
33. DeVon HA, Block ME, Moyle-Wright P, et al. A psychometric toolbox for testing validity and reliability. *J Nurs Sch*. 2007;39(2):155-164. doi:10.1111/j.1547-5069.2007.00161.x

34. DeVellis RF. *Scale Development: Theory and Applications*. Vol 26. 4th ed. University of North Carolina, Chapel Hill, USA: SAGE Publications, Inc; 1991.
35. Nunnally JC, Bernstein IH. *Psychometric theory*. 3rd ed. New York: McGraw-Hill; 1994.
36. Renaud J-S, Côté L. Validation of the 5-item doctor-patient communication competency instrument for medical students (DPCC-MS) using two years of assessment data. *BMC Med Educ*. 2017;17:189. doi:10.1186/s12909-017-1026-9
37. Shay LA, Lafata JE. Where is the evidence? a systematic review of shared decision making and patient outcomes. *Med Decis Mak*. 2015;35(1):114-131. doi:10.1177/0272989X14551638
38. Anastasi A, Urbina S. *Psychological Testing*. 7th Editio. Upper Saddle River (NJ): Prentice Hall; 1997.

Supplementary Material

Supplement 1. Participant comments made while completing the IcanSDM scale.

Supplement 2. Frequency distribution of answers to each item before (t0, top graph) and after (t1, bottom graph) the e-TUDE training program in the study group.

Supplement 3. Item-wise and overall internal consistency as evaluated using the complete list of 11 items.

Supplement 4. Item-wise and overall internal consistency as evaluated using the selected list of 8 items.

Figures

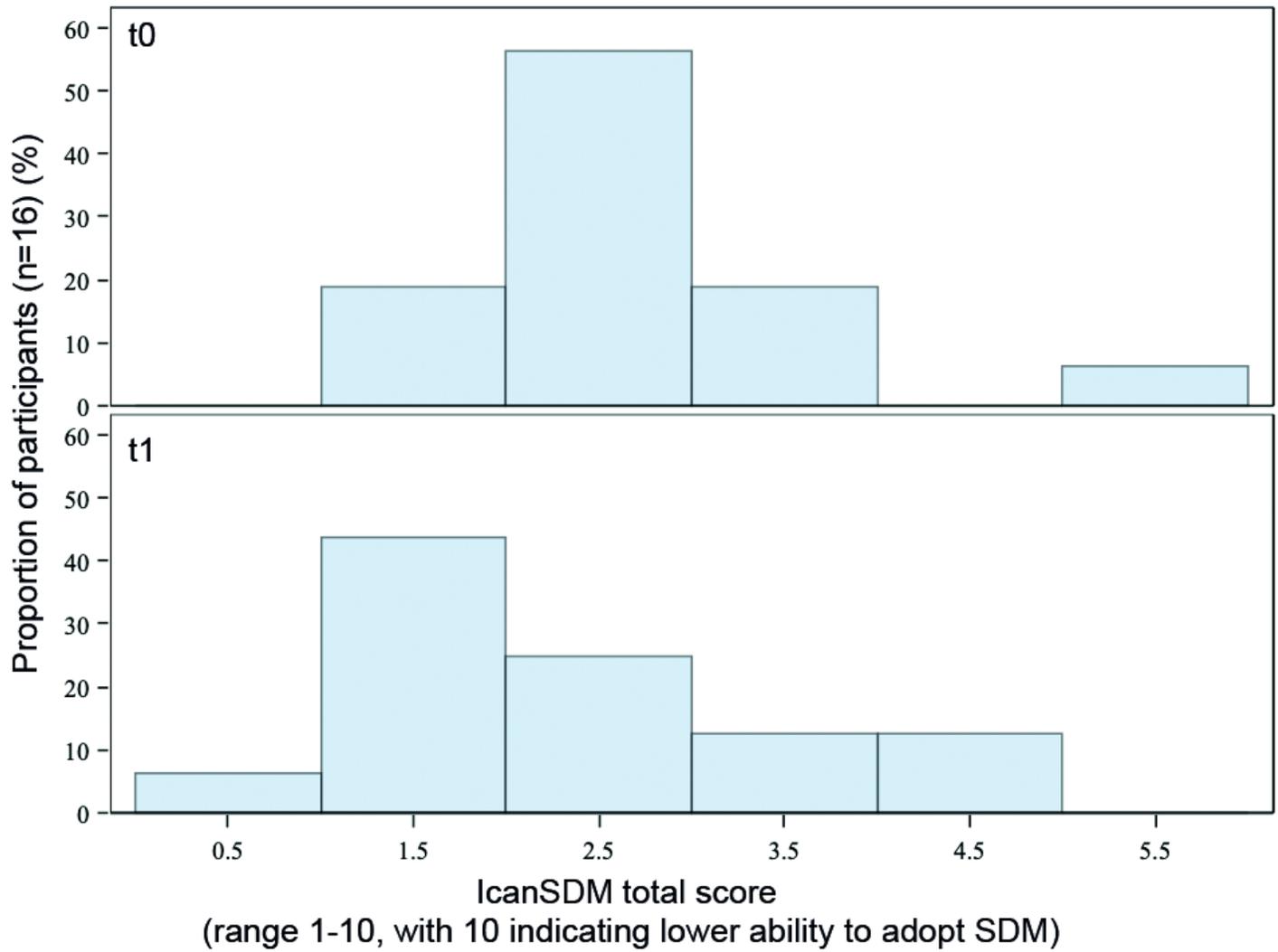


Figure 1

Frequency distribution of answers to the eight items retained, before (t0, top graph) and after (t1, bottom graph) the training program.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Supplement3.docx](#)
- [Supplement1.docx](#)
- [Supplement2.docx](#)
- [Supplement4.docx](#)