



NEW EDUCATIONAL METHOD

REVISED **Development and implementation of a tool for measuring the training effectiveness of the patient-centered consultation model [version 2; peer review: 1 approved, 2 approved with reservations]**

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Abstract

Background: The patient-centered consultation model comprises four elements: exploring health, illness and disease experiences, understanding the whole person, finding common ground, and enhancing the patient-doctor relationship. This method is taught at the course in general practice at Copenhagen University. The aim of the study was to develop a simple tool consisting of a questionnaire about the patient-centered elements and a test video consultation. The outcome is the change in the students' ability to identify these elements. Used as a pre-course and post-course test it can inform the teachers which elements of the patient-centered consultation need intensifying in the teaching.






Methods: The students from a course in general practice volunteered to participate in all steps of the development. They took part in individual interviews to select items from an already existing questionnaire (DanSCORE). The preliminary questionnaire was tested for face and content validity, pilot-tested and tested for test-retest reliability. All video consultations were transcribed and assessed for patient-centered elements through a conversation analysis. The videos showed medical students seeing real patients.

Results: The preliminary version of the questionnaire (called DanOBS) had 23 items. In the subsequent interviews, items were reduced to 17, each with three response options. After a pilot test, the questionnaire was further reduced to 13 items, all strictly relevant to the model and with two response options. The final questionnaire had acceptable test-retest reliability. The number of test consultation videos underwent a reduction from six videos to one.

Conclusions: The DanOBS combined with a test video consultation, used as a pre-and post-course test demonstrates for teachers which elements in the patient-centered consultation need to be intensified in the teaching.

Open Peer Review

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Any reports and responses or comments on the article can be found at the end of the article.

Keywords

patient-centered care, medical students, assessment of teaching

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REVISED Amendments from Version 1

I have had useful comments from two reviewers. I have clarified the use of the DanOBS tool and inserted three paragraphs about the validation of the tool, which seemed needed.

I have corrected minor details such as describing why the tool was called DanOBS and explained what OSCE stands for.

I have added a table about the flow of developing the questionnaire in Zenodo.

Any further responses from the reviewers can be found at the end of the article

Introduction

The patient-centered consultation model, defined by Levenstein, Brown and Stewart has been taught at the general practice course at Copenhagen University since 1991¹⁻³. This model has demonstrated reduced health cost expenses and increased patient satisfaction and compliance^{4,5}. It was introduced in the sixties among others by Balint⁶. Later a group of Canadian and English researchers discussed and refined the model⁷. Medical students express a positive attitude toward the patient-centered model for health care delivery⁸.

The general practice course takes place just prior to graduation as medical doctors. Here the students work eight days in a general practice clinic seeing patients on their own and video record their consultations. In small group sessions they receive feedback on their videos from peers and a university teacher.

Based on the patient-centered consultation model a simple framework named the “Consultation Process” is used in teaching general practice at Copenhagen University⁹⁻¹² (see Table 1).

Also based on this model a questionnaire (DanSCORE: Danish Structured Observation Registration Evaluation) was developed

to be used in a pre-and post-course test. The DanSCORE is completed by students after having watched a test video showing a general practitioner and a simulated patient. Hence, the scoring depends on the video shown. The DanSCORE questionnaire was used in two studies^{13,14}. Data from the DanSCORE response options were reduced to either “correct” or “incorrect” – one point for correct and zero point for incorrect answer. The outcome was difference in percentage of correct answer before and after course. In the previous two studies, the DanSCORE project demonstrated pronounced differences in the communication items.

Another framework also based on the original patient-centered model is “The Global Communication Consultation Rating Scale” based on the Calgary-Cambridge guide to the medical interview. It has 37 items, each with four response options¹⁵. It was developed by general practitioners and used in many medical settings to evaluate communication between healthcare workers and patients or clients¹⁶⁻¹⁹. The rating scale was used in general practice in a small pilot study with 26 students in Sweden in 2019²⁰. The results were used to investigate medical students’ consultation skills assessed by video recordings of their consultations with real patients. The video recordings were assessed by the students and compared with the ratings of the instructors. The conclusion of the study showed moderate concordance and a need for further research.

The Patient Perception of Patient-Centered Communication (PPCC) for assessing a patient-centered consultation as defined by Levinstein, Brown and Stewart could have been eligible for review, but was meant for patients and clinicians²¹ and an article about measuring patient-centeredness by Epstein *et al.* did not reveal a questionnaire especially for medical students observing a consultation²².

In 2014 Stewart *et al.*²³ reduced the patient-centered consultation model from six to the four most important components:

Table 1. The “Consultation Process”.

Make an agreement about the topic for the consultation	The patient’s part (Patient’s narrative)
Clarify the patient’s function	
Clarify the patient’s ideas about symptoms	
Clarify the patient’s feelings	
Clarify the patient’s expectations	
Use summarizing as a mean of obtaining common understanding	The doctor’s part (History-taking and examination)
Take history	
Clinical examination	
Use summarizing as a mean of obtaining common understanding	The mutual/ common part (Agreement on diagnose and plan)
Reach common understanding about diagnosis and plan.	
Inform the patient on how to react to symptoms during the course of the illness (safety-netting)	

- exploring health, disease, and illness experiences of the patient
- understanding the whole person
- obtaining common ground
- enhancing the patient-clinician relationship

This model covers the content of the teaching when “The Consultation Process Model” and “Calgary-Cambridge Model” is used. The “Consultation Process Model” is meant to be used in teaching general practice and the Calgary-Cambridge model is to be used anywhere in the health care sector. In the first model, room has been made for the patient’s narrative, which is important as the doctor in general practice must have the whole story as the first health care worker seeing the patient.

“The DanSCORE” and “The Calgary-Cambridge Global Communication Rating Scale” are the only questionnaires that have been used in research with undergraduate medical students observing a video consultation. However, both questionnaires are extensive and the DanSCORE in addition also includes clinical items and general items.

The aim of this study was to develop a tool for students to use as self-evaluation and examine the results to guide teaching, both in a concurrent course and in future courses. The tool should consist of a questionnaire and a test video of a consultation in general practice. It was the aim to develop a simple and yet comprehensive questionnaire including the four components described by Stewart *et al.* The test video and the questionnaire should be useful as a pre-and post-course test of the students’ knowledge of the patient-centered consultation model. It should demonstrate for teachers which elements of the patient-centered consultation are successfully taught and which elements need to be intensified, and the effect of the educational interventions.

Methods

In the development of the questionnaire, which includes three steps, 312 out of 375 (83%) final term general practice students at Copenhagen University participated in autumn 2017 and spring 2018. In the first two steps, 17 students volunteered to an interview. In the third step, 295 (79%) out of 375 possible agreed to participate in the pilot tests.

First step: Selection of items

It was decided to let students explore and select items containing patient-centered elements from the DanSCORE that they found relevant to the consultation model they are being taught.

In the preliminary interviews in May 2017 two male and two female students, aged 26–30 years, from different small groups, volunteered to be interviewed individually by one of the authors (HT).

The students selected 23 of the 33 DanSCORE items. Five of the ten items they removed were clinical items and five items

were about communication in general. In addition, they found six different numbers of response options confusing and the wordings in some items confusing.

The students suggested four response options (“too much”; “appropriate”; “too little”; “not mentioned”) for use in the preliminary version of the questionnaire (now called DanOBS-1), which was then ready for field tests.

Second step: The field tests

Test for face-and content validity and content coverage was carried out with the first version of the 23-items questionnaire (DanOBS-1). Thirteen students participated in individual interviews (four males and nine females, aged 26 to 30 years). During the interviews, one of the authors (HT) asked the students to read aloud each item and to comment on its relevance to the patient-centered consultation model. They were asked if the items were easy to understand and to complete, and whether the response options were appropriate.

During individual interviews, the number of items were gradually reduced from 23 to 17. Four items were removed. Two items were covered by other items, and two items were irrelevant. New wordings of the items were suggested without distorting the content, and the response options were reduced to three (“yes”; “partly”; “no”).

Finally, both the wordings, the response options and the content of the items were accepted by the students.

The third step: The pilot tests

In spring 2018, the second 17-items version of the questionnaire (DanOBS-2) was completed by the students after having heard a lecture about the patient-centered consultation model and watched a test video of a student seeing a real patient in general practice. The videos used were face to face consultations and not constructed for the purpose. This procedure was repeated after the five-weeks course with the same students. The students were informed that they were free not to complete the questionnaire.

In addition, four female teachers at the course in general practice at Copenhagen University (aged 42 to 67 years) commented on the preliminary questionnaire. At the first day of the course the students participate in a communication workshop, where they watch and evaluate a consultation video together with two teachers. Here the teachers were asked to fill in the questionnaire. The teachers assessed the order of the items and each item’s relevance to the patient-centered consultation model they taught. Minor changes were made in the order of the questions but not on the items as such.

Taking the results of the pilot tests into account the authors once more thoroughly examined each item and whether a majority of students failed to answer certain questions. As a consequence, some items of the questionnaire were either merged or deleted. The authors also decided to have only two response options (see below).

The questionnaire ended up having thirteen items with each two response options (DanOBS-3).

The steps in the development of the questionnaire are presented in the Zenodo repository. See below.

Modification of the response options

The students participating in the field test suggested three response options “yes”/“partly”/“no”.

Based on experiences from the pilot test the authors finally decided to use a “yes”/ “no” option forcing the student to decide if a particular element in the model was present or absent. The response option “partly” was often used by the students in the pilot tests and could be an easy way out for students not bothering to decide.

When calculating course effectiveness, the responses will have to be divided into “correct” and “incorrect”. Therefore, the response “partly” was also difficult to handle.

Reliability of the questionnaire

At a stage where the students had been taught the patient-centered consultation model for three weeks, a test-retest reliability was carried out with the final version of the questionnaire. The students watched the same consultation video and completed the questionnaire twice with an interval of one week where no classes were scheduled. Thirty students took part.

Implementation of the tool

The tool (the DanOBS questionnaire and the test consultation video) was implemented in the spring term of 2018. After an introduction to the patient-centered consultation model the first day of the course, the students completed the questionnaire after having seen a consultation video with a student seeing a real patient. This was repeated after the course with the same video, in which a female patient presented with rhinosinusitis symptoms.

One point is given for correct answer and zero point for incorrect. These numbers are automatically downloaded into Microsoft Excel and placed in a pre-designed spreadsheet. The results are available immediately after the teaching session and give the teachers information for the next courses. Effect sizes are calculated as the mean difference between the answers before and after the course divided by the mean variation before the course²⁴.

The data are analyzed in Microsoft Excel and R (statistic program).

Ethics

The study was carried out in accordance with relevant guidelines and regulations. The students were informed that the purpose of the study was the evaluation of the teaching, and they were informed that they could refuse to complete the questionnaires. According to Danish law, studies entirely based on data collected from registers and questionnaires do not

need approval from an ethics committee [Government D. Law Nr 593 of 2011.06.14. Act on the ethical treatment of health science research projects; accessed 3rd December 2018) and confirmed by Copenhagen University (registration number 2265044) <https://en.nvk.dk/rules-and-guidelines/act-on-research-ethics-review-of-health-research-projects>].

The students volunteered to participate in the interviews and field tests. The first author was a teacher at the course, while the interviewer was affiliated to the Department of General Practice as a researcher. None of the other authors participated in the teaching.

The test consultation videos were recorded during the students’ work in general practice. The patients participating are informed verbally and in writing that the videos will be used at the course in general practice at the Copenhagen University. The patients are also informed that the video will be deleted automatically after one year or immediately on request of the patient. The video consultations used in the teaching and presented in the exam are automatically deleted two weeks after the exam. The patients gave written consent. Only students at the actual course have access to test videos on the learning platform and have signed a document to observe professional secrecy. The teachers were general practitioners and had by virtue of that duty of confidentiality.

The students at the course were informed that the data from the questionnaire would be anonymously analysed.

Results

The new questionnaire with 13 items (DanOBS) corresponds satisfactorily with the four components of the patient-centered consultation model as defined by Moira Stewart in 2014²⁴:

The first component “exploring illness, health, and disease experiences” is covered by four items describing elements that are new to the students and of importance in a patient-centered consultation.

- *Are the patient’s expectations of the outcome of the consultation clarified? (Item 2)*
- *Are the patient’s ideas about their symptoms clarified? (Item 3)*
- *Is it discussed whether the patient has done anything about their symptoms? (Item 4)*
- *Are the patient’s concerns discussed? (Item 6)*

The second component “understanding the whole person” deals with enough time in the consultation for the patient to tell his/her illness experiences and the effect on his/her daily life.

This element is less complex, easier to assess and covered by two items.

- *Is the impact of the patient’s symptoms on their daily life discussed? (Item 5)*

- Does the doctor give the patient enough time to talk about their symptoms? (Item 10)

The third component “finding common ground” is covered by five items. This issue is extremely important in a consultation, especially in general practice, where the doctor might be the only healthcare worker that sees the patient. This issue is focused on in the training and covered by five items.

- Do the doctor and patient make an agreement on the topics for the consultation? (Item 1)
- Does the doctor regularly summarize during the consultation? (Item 7)
- Does the doctor make sure that the patient understands the outcome of the consultation? (Item 11)
- Is the patient informed about what to react to in the expected course of the illness? (Safety-net) (Item 12)
- Does the doctor ensure that the patient understands the rationale for the agreed plan? (Item 13)

The fourth component: “enhancing the patient-doctor relationship” concerns the doctor’s use of understandable terms, not alienating the patient and the doctor’s use of welcoming body-language. This element is less complex and covered by two items.

- Does the doctor use term, the patient understands? (Item 8)
- Is the doctor’s body language welcoming? (Item 9)

The new questionnaire was evaluated for relevance and for face and content validity and test re-test reliability. For the results of the reliability test see Table 2.

Reliability test

In total, 30 medical students watched a test consultation video and answered the DanOBS a week apart with no scheduled teaching lessons in between. A correlation coefficient >70 is acceptable. The correlation coefficients here are regarded as acceptable. Table 2 shows the results of the reliability test.

Implementation results

The tool (the DanOBS questionnaire and test consultation video) was then implemented in a course in general practice spring 2018 for 59 students (student scores before and after the course for DanOBS can be found in the *Underlying data*). The acceptable percentage of correct answers after the course is targeted to >80% as the students are close to graduation as doctors. Table 3 shows how the spreadsheet of the student’s scores should be interpreted. An example of student scores can be seen in Table 4. In six items the percentage of correct answers after the course is <80%; therefore, teachers at the next course will have to intensify the teaching in these elements.

Discussion

An important motivation for the DanOBS was the wish to provide means for the students in the general practice course to

Table 2. Results of the reliability test.

Item	First response 'Correct answers'	Second response 'Correct answers'	Pearson's correlation coefficient
1	0,77	0,77	1,00
2	0,97	0,93	0,69
3	0,93	0,97	0,69
4	0,77	0,77	1,00
5	0,93	0,93	1,00
6	0,93	0,87	0,68
7	0,90	0,93	0,80
8	0,93	0,93	1,00
9	0,97	0,97	1,00
10	0,80	0,77	0,91
11	0,90	0,90	1,00
12	0,40	0,43	0,80
13	0,73	0,73	1,00

Pearson's Correlation Coefficient takes on a value between -1 and +1. Here -1 indicates a perfectly negative linear correlation, 0 indicates no linear correlation between two scores and finally +1 indicates a perfectly positive linear correlation between two scores.

Table 3. General interpretation of the spreadsheet of student scores.

Arrows pointing <i>upwards</i> mean that positive learning has taken place but in some cases not enough
Arrows pointing <i>downwards</i> mean loss of knowledge or confusion about the topic
Arrows pointing <i>sideways</i> mean no change has taken place
A calculated <i>effect size</i> >0,20 indicates that the students have learnt about the topic on the course
A calculated <i>effect size</i> >0,80 indicates that the training on the course had been utmost successful

self-evaluate their knowledge about the good consultation process. Such evaluation was naturally implemented by pointing out whether the various parts of the “Consultation Process” were present or absent in a video consultation; inquiry into the parts of the consultation process tentatively done by directly asking into them. A preliminary version with 23 items was deemed too cumbersome and had multiple questions asking into the same aspect. Hence, this was brought back to 13 questions adequately and concisely covering all parts of the consultation process, each item addressing a separate aspect of the consultation process. A portfolio of video consultations online now provides for the students’ evaluation needs.

Table 4. An example of data from a spreadsheet from a course in autumn 2018.

No.	Items	Before (%)	After (%)	Diff. (pp)		ES
1	Agenda setting	87,0	97,8	10,9	↑	0,32
2	Expectations	69,6	73,9	4,3	↑	0,13
3	Ideas	91,3	97,8	6,5	↑	0,19
4	Self-treatment	91,3	97,8	6,5	↑	0,19
5	Impact on daily life	84,8	95,7	10,9	↑	0,32
6	Concerns	87,0	93,5	6,5	↑	0,19
7	Use of summarising	26,7	51,1	24,4	↑	0,72
8	Understandable terms	100,0	97,8	-2,2	↓	-0,06
9	Body language	65,2	71,7	6,5	↑	0,19
10	Sufficient time	63,0	65,2	2,2	↑	0,06
11	Understand outcome	67,4	63,0	-4,3	↓	-0,13
12	Safety-net	93,5	100,0	6,5	↑	0,19
13	Understand plan	76,1	76,1	0,0	→	0,00

Diff (pp) means difference in percentage points. See Table 3 for interpretation of the spreadsheet.

Further motivation for the DanOBS tool was the idea to use the students' self-evaluation results to guide teaching, both of the concurrent course and future courses. This was implemented by having a common evaluation round at the start and at the end of each course. High percentages of correct answers in certain items in the round at the start of the course would tentatively mean that these aspects may not need much attention in the teaching that follows. Furthermore, if there is not much difference – or even a decline – in correct answers in certain items between start and end of the course, this would mean that teaching in these aspects had not been adequate and should be addressed more in future courses. This was illustrated in Table 4. Hence, DanOBS does not claim to measure teaching quality or tutors' performance normatively, it merely points towards areas where teaching is particularly needed; primarily aimed at the individual student, but now also made operational for teachers.

Measuring effectiveness by a pre-and post-course test is often used in educational research. Letting students evaluate a consultation as a test is new. Humphris and Kaney, and Baribeau have introduced the OSVE (Objective Structured Video Examen). The students participating in these studies were younger and the consultation models different^{25,26}. No follow-up has been published.

No instrument has been developed and validated specifically for medical students to complete when observing a consultation. The Global Communication Consultation Rating Scale has been tested for reliability by general practitioners and pilot tested by medical undergraduate students when assessing their own recorded consultation from general practice^{15,20}. The students evaluated their skills higher than the trained observers.

One way of measuring course effectiveness is to evaluate the students' performance in an OSCE (Objective Structure Clinical Examination) but most questionnaires or rating scales used are of poor psychometrical quality^{27,28}. Self-efficacy measurement before and after a course can be used but are often in poor concordance with observed performance^{20,28}.

Since DanOBS addresses each of the 13 items separately and does not aggregate them into a single (or multiple) score, there is no internal structure to examine. E.g. Cronbach's alpha measures internal consistency of a sum scale, but we do not sum the items, and while we identify four components of DanOBS, this is mainly to organize teaching and not to create a multidimensional instrument. DanOBS is not meant as a psychometric instrument.

It is a strength in this study that final year medical students participated in all different steps of the development of the questionnaire. This includes face and content validity, the test-retest reliability and in the pilot tests as well testing the number of videos to be combined with the questionnaire. This is in accordance with Brouwers *et al.*, who state that a questionnaire should be developed in the context where it is going to be used²⁹.

It is a strength that the tool can give immediate information on the effect of educational interventions.

The tool can be used any time during the course to inform the students about their progress in understanding the patient-centered consultation model. If the test can be completed several times and with different videos, it acts as a learning tool.

It could be a limitation that the students volunteered to participate in the testing. For the face and content validity test it was important that the students were enrolled in the course and had the same conceptual understanding of the model. As they were taken away from the teaching session and interviewed, we found it appropriate to let them consent voluntarily.

It could be a limitation that the tool only can be used in students being taught the patient-centered consultation model according to the Calgary-Cambridge model or the Consultation Process model, but these two models are the most widely used in the health care sector. The questionnaire cannot be used by all health care providers. If so, we recommend a new user-specific test for face and content validity.

It is also a limitation that the tool measures a narrow conceptual understanding of the consultation model and cannot be used to measure performance.

It is a limitation that the pilot test was planned to involve six different videos and ended up with two. In the final stage of the pilot test, one video was used before the course and a different video after the course. It was assumed that a correct answer must be a correct answer no matter which video was shown. However, it could always be questioned whether the two videos were equally easy to assess. Therefore, after the pilot test it was decided in the future to show the same video before and after the course when effectiveness of course was measured.

As the tool detects verbal elements, it can also be used in the assessment of remote video- and telephone consultations

The students in this study observe the verbal expression of patient-centered elements, verified by a conversation analysis by the first author, who has more than 25 years training in evaluating student-patient videos. The DanOBS questionnaire has only two response options “yes”/“no” to ensure that the students are forced to decide if the element is verbally covered. The effect of the course is the change in ability to identify verbal expressions of patient-centered elements from before the course to after the course. To validate the DanOBS questionnaire further would be difficult as no other constructs exists that measure students’ observation of patient-centered elements in a consultation as defined by Stewart *et al.*³

The questionnaire only contains items about patient-centered elements, as the experience from using a more comprehensive questionnaire (DanSCORE) showed most pronounced change in the communication elements that contained most of the patient-centered elements. The students had no problems in evaluating clinical or general issues as they were not new to them. The DanOBS questionnaire resembles to some extent a checklist and the items are evaluated one by one.

Brame found that the attention span of students watching educational videos declines after six minutes³⁰. It was concluded that showing one video with a length of 10–15 minutes is more than enough but can be justified by students being eager to learn what is expected of them in the final exam.

Conclusion

A simple and short questionnaire combined with one test video for measuring the effect of teaching patient-centered consultation

to medical students has been developed and presented in a Microsoft Excel spreadsheet to inform the teachers about the effectiveness of their teaching.

Practice implication

A simple tool for teachers to assess the effectiveness of training patient-centered consultations has been developed, called DanOBS. The final questionnaire with 13 items is short and easy for students to complete after having watched a consultation video.

The tool can be used to measure the effect of teaching and of interventions (workshops, role-playing etc.) as it is simple, does not take up much time in a time-pressured study program, and gives immediate responses. The tool can be used during the course as supplementary learning material

Data availability

Underlying data

Zenodo: Development and implementation of a tool for measuring the training effectiveness of the patient-centered consultation model, <https://doi.org/10.5281/zenodo.6477458>³¹.

This repository contains the following underlying data:

- Reliability calculation.xlsx (full scores from the reliability test)

Extended data

Zenodo: Development and implementation of a tool for measuring the training effectiveness of the patient-centered consultation model, <https://doi.org/10.5281/zenodo.6477458>³¹.

This repository contains the following extended data:

- DanOBS_questionnaire.docx (questionnaire)
- Example of use of spreadsheet.xlsx (an example of the use of the tool. Data from one course._2.xlsx (scores before and after course))
- Empty_spreadshet.xlsx (Microsoft Excel scoring spreadsheet (blank copy))

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Asmaa F. Sharif 

Clinical Medical Sciences Department, College of Medicine, Dar Al Uloom University, Riyadh, Saudi Arabia

The authors proposed a modified form of (DanSCORE) questionnaire as a means of improving the student's perception of the patient-centered consultation model. The idea seems interesting, and I have a few comments that might improve the manuscript:

- I suggest the authors could add a detailed description to the general practice course in terms of the weight of eight days to the curriculum, and the conventional evaluation method. Were the conventional grades of the course pass or fail or was it graded out of total mark? Besides, and as I could understand, the authors change the formatting of the evaluation method. As they mentioned the old framework adopted peer evaluation, while in the proposed model, the authors talked about a self-evaluation form. The reader might get benefit from more clarification concerning keeping the peer evaluation side to side with self-evaluation or omitting it.
- The main concern about the idea of the work comes from the sole subjective nature of the evaluation. Students might think that they are well skilled and of high level. It would be more reliable and objective if the authors compared the grades and achievements of this cohort of students with controls or with other batches enrolled in classical courses. OSCE exam might be a suitable tool to assess students' performances. Tutor evaluation is another suggested evaluation form.
- Moreover, I would expect the authors to clarify if students were allowed to watch only a specific category of patients (i.e. outpatients or cold cases) or if students can see all types of patients. On which basis the used videos were selected? If there are any eligibility criteria for videos to be included, I suggest adding them to a flowchart.
- The authors mentioned response rates of 79-83%. What about the remaining 17% of candidates? why do the authors exclude them? What about students disinterested in participating? Elaborate more.

- The authors should give an explanation about changing the response from Yes, No, and Partly to Yes and No in spite of the previous agreements of students in step 2. Add a reference supporting your point of view about the difficulty in handling the response partly.
- It is fine that the authors calculated the reliability of the used tool, I was expecting them also to mention the value of Cronbach alpha to estimate the validity of the used questionnaire. Though I could read the author's argument about the non-psychometric nature of the adopted questionnaire, I recommend calculating the validity for the four components separately.
- Add the version of the software (Microsoft Excel and R) used in statistical analysis.

Is the rationale for developing the new method (or application) clearly explained?

Yes

Is the description of the method technically sound?

Partly

Are sufficient details provided to allow replication of the method development and its use by others?

Yes

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Medical Education, Forensic Medicine and Clinical Toxicology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 17 May 2022

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Helen Atherton

Unit of Academic Primary Care, University of Warwick, Coventry, UK

I am happy with the changes.

Is the rationale for developing the new method (or application) clearly explained?

Partly

Is the description of the method technically sound?

Partly

Are sufficient details provided to allow replication of the method development and its use by others?

Partly

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: General practice, the consultation, access to general practice, digital health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 11 April 2022

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Chris Roberts 

Health Professions Education, Sydney Medical School, University of Sydney, Sydney, NSW, Australia

I very much enjoyed reading and reading this paper describing some early validation evidence for

the use of a general practice video consultation rating scale (DanOBS). The scale was developed in the context of an immersive general practice placement for senior medical students. (I didn't easily spot what DanOBS stands for as an acronym).

As I understand it, the authors experienced some shortcomings with existing tools when considering the performance of students in patient centred consultations, and the time available for rating. They developed a multi-step process of reviewing the literature and consulting with students and teaching faculty to come up with a new or modified scale of 13 items (DanOBS). Having developed the prototype they then went on to collect some further validity evidence on its usage from 79% of the cohort (n= 295/375) including test retest reliability. It was used as an assessment of student performance. This was done by testing students on a video pre-course and then post-course. They then go on to recommend contexts where the tool might be used as a way of rating a clinical tutors' performance.

There is much to commend in this work, and the DanOBS looks like a useful (and short tool) to rate student performance either formatively or as part of a summative assessment of the placement with useful checklist items to provide qualitative feedback to the student. Others in GP settings may find that they can adapt this scale to their local context. I am less convinced in its current version that it could be used to evaluate teaching quality. In developing this work in the future, the authors might like to consider other examples of the reporting of validity evidence for scale development for use in general practice as a teaching or assessment tool. Whilst the content and process aspects of the tool is well described, demonstrating the internal structure of DanOBS might have used Cronbach's for internal consistency, and a factor analysis to determine the number of domains in the scale. It might be interesting to see how the total score relates to student performance? The test retest might not be your strongest validity evidence?

I think writing upscale development is hard to do and a graphic/table of the differing steps, including the assessment involved in the process, might help. My suggestions for strengthening the article relate to

1. Making a strong case for why a new scale is required
2. Clarifying each of the steps of instrument development, so that someone else reading this article can exactly follow the steps and come up with similar results.
3. Providing as much detail of the assessment as possible to judge the psychometric claims
4. Reconsider the conclusion about teacher evaluation based on the data presented in this study.

I would encourage the authors to further develop the validity evidence for this scale. Given how much work new scale development involves, I would suggest taking some advice from the psychometricians on current ways of reporting validity evidence.

Is the version DanOBS questionnaire 2.docx the version you would wish others to use in their own research contexts?

Is the rationale for developing the new method (or application) clearly explained?

Partly

Is the description of the method technically sound?

Partly

Are sufficient details provided to allow replication of the method development and its use by others?

No

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Professionalism, assessment, community based education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 20 Apr 2022

Merete Jorgensen, Copenhagen University, Copenhagen, Denmark

Thanks a lot for your comment. The tool can be used before and after courses to measure teaching effectiveness. It can be used as a training tool for students, but not for summative assessments. I see your point about the validity testing and find a need to clarify this issue in the next version, but here is a short answer: As I write in the article no constructs, especially for medical students observing a consultation exist. As for consistency, it can be difficult as the items in the different domains are very different. But I will work on an understandable comment. Volkert Siersma is a statistician who works with psychometrics and he gives the explanation above. We will make it more clear in the next version.

Competing Interests: none

Reviewer Report 29 March 2022

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**Helen Atherton**

Unit of Academic Primary Care, University of Warwick, Coventry, UK

This is a really interesting report about an approach to assessing the patient centred consultation model in medical schools doing general practice placements. The team have used the resources at their disposal to come up with a tool to apply in their setting.

Whilst an interesting report there were some areas that it would be helpful to have more information:

- In the methods, under 'first step' please can you provide more information about the process of selection? Was it simply preference or was there a methodological approach taken?
- In the methods under 'third step' please can you clarify whether the video consultation watched is a consult carried out by the student or is an example consult? Are these consultations face to face consultations that are video taped or are they remote consultations? Denmark uses a lot of email consultation, does it apply to those too?
- For the 'modification of the response options' how were these decisions made? Was it again down to personal preference or was it based on evidence about how people answer these sorts of things?
- Can you justify the use of students to conduct this work? Why not use a mixture of participants including healthcare professionals? The use of volunteers to refine the tool is a significant limitation and this should be mentioned. Overall the limitations are not really discussed and it would add to this work if you were explicit in the discussion about the issues with the methodology so that future studies could plan to avoid these.
- Since conducting this work the number of remote consultations has increased. Although your work does seemingly not cover this, it would help to see some comment in the discussion about how this tool would apply to a remote consultation (telephone, video, email)?
- The conclusion refers to the tool being used to inform the teachers about the effectiveness of their teaching. Why isn't it a tool to inform the students about the effectiveness of their learning? Unfortunately, I don't see how this tool can claim to assess effectiveness in either direction when it has been devised 'in house' and with volunteers. It would be better to describe it as a tool that can guide learning in students in this setting, and that is open to future validation in rigorous independent studies.

This article is a useful description that other providers may wish to draw on in devising their own approaches that work for their own setting and if desired with further work this could be developed further, though this is not necessary for setting specific use.

Is the rationale for developing the new method (or application) clearly explained?

Partly

Is the description of the method technically sound?

No

Are sufficient details provided to allow replication of the method development and its use by others?

No

If any results are presented, are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions about the method and its performance adequately supported by the findings presented in the article?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: General practice, the consultation, access to general practice, digital health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 Apr 2022

Merete Jorgensen, Copenhagen University, Copenhagen, Denmark

Thanks a lot for your comments which I find helpful and I will comment and revise the article accordingly. The test for face and content validity was performed with medical students and cannot easily be transferred to other health personal.

Competing Interests: None