PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Assessment of the effect of an Interactive Dynamic Referral Interface (IDRI) on the quality of referral letters from general practitioners to gastroenterologists- a randomized cross-over vignette trial
AUTHORS	Eskeland, Sigrun; Brunborg, Cathrine; Rueegg, Corina; aabakken, lars; Lange, Thomas

VERSION 1 - REVIEW

REVIEWER	Carolyn O'Shea Medical Eductor, Eastern Victoria GP Training and General Practitioner, Greensborough Road Surgery, Australia
REVIEW RETURNED	31-Oct-2016

GENERAL COMMENTS	Thank you for the opportunity to review this paper. I am not clear whether this manuscript is important enough for the journal to publish as this paper alone is unlikely to provide enough information for people to change practice or influence decisions. Whilst it demonstrates that there is an improvement in the quality (which is largely the amount) of the information using the checklists, this is something that has already been demonstrated (including in references 27 and 29 of the manuscript). Whilst acknowledged as a limitation that this study does not consider the impact on triage and clinical outcomes. Two studies I am aware of in the Australian context have not found the quality of the referral impacted ability to triage in an experimental trial (Br J Gen Pract. 2014;64(624), e419-25) and in real life (J Stroke Cerebrovasc Dis. 2015;24:874-80). This manuscript is original in that it uses the TPS which is a scale the authors have developed and had been published. Whether it is original and important enough for publication in this journal, is a decision for the editor. The article makes sense and is readable and understandable. In regards to specific sections. Introduction - End of first paragraph. Whilst I agree the referral letter is frequently the only available information when deciding on the patient priority to be seen, one would expect a consultation with the patient is also available before deciding on work up or treatment Methods - Were there any inducements, payments, etc for GPs to participate? - Could you please provide more information on how the study team member facilitated communication with the vignette when needed?

	- Was the investigator who scored all the referral letters blinded to whether it came from checklist support or standard referral? What cross scoring or checking was there? Results - It is stated that the inclusion was ended as the targeted N was met, but that is not consistent with the power estimation. There was over 50% drop out from randomisation, much of that between round 1 and 2. I am not sure how the 45 GPs included GPs was reached as different from the CONSORT flow chart (maybe it is the 55 randomised less the 10 who did not show up in round 1?). - Is there any data to compare the participant demographics with all Norway GPs or all GPs in the region? Discussion - In Figure 2 there is in each case one or more score that are worse with the checklists, have the authors analysed this and do they have any thoughts about why this may be the case? Strengths and limitations - Given the standard referral TPS is higher than the validation study, could part of the reason be volunteer effect? Implications of the study - Whilst as pointed out the effect of templates on referral letter quality is reasonably well documented, I would suggest that it is premature to suggest that EHR providers should be encouraged to include them until there is a clear link between checklists and more appropriate triage or clinical outcomes. The authors themselves in the unanswered questions point out that is unknown (and there is some literature I referred to earlier that checklists and referral quality does not improve outcomes). I am also only seeing the CONSORT flow chart, not the checklist.

REVIEWER	Peter Vermeir Ghent university Hospital / Ghent University Belgium
REVIEW RETURNED	13-Dec-2016

GENERAL COMMENTS	This study addresses a topic of potential interest to readers of BMJ Open. The study has potential impact in that it informs GPs and hospital-based specialists about the importance of good referral letters. Congratulations with the resuls of your paper. It is clear that good communication between GPs and hospital-based specialists can reduce adverse events and makes healthcare more safe and transparant.

REVIEWER	Mattijs E Numans LUMC dept Public Health and Primary Care Leiden, the Netherlands
REVIEW RETURNED	16-Apr-2017

GENERAL COMMENTS	Very interesting and important study, not previously carried out and it adds to the knowledge of measuring and improving quality of referral communication. No major methodological concerns in my opinion. I agree that, although this are GI vignettes, these results

	might reflect results in other clinical domains. However, in evaluating the acceptance of such a referral supporting system among referring GPS, I seem to miss comparison of invested time fully. Is this something not measured? It might be one of the reasons GPS will or won't work with the system in the end, as is the case with many (other) eHealth or expert support systems. Another point is the degree of integration of the referral support system into the GP's EHR. Is the referral letter generated straight from the EHR, how many practical steps are in between. I think both aspects (time and technical integration as thresholds between proven effect and successful implementation) should be appointed and discussed more intensively.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Carolyn O'Shea
Institution and Country: Medical Eductor, Eastern Victoria GP Training and General Practitioner, Greensborough Road Surgery, Australia Please state any competing interests: None declared

Please leave your comments for the authors below

Thank you for the opportunity to review this paper.

I am not clear whether this manuscript is important enough for the journal to publish as this paper alone is unlikely to provide enough information for people to change practice or influence decisions. Whilst it demonstrates that there is an improvement in the quality (which is largely the amount) of the information using the checklists, this is something that has already been demonstrated (including in references 27 and 29 of the manuscript). Whilst acknowledged as a limitation that this study does not consider the impact on triage and clinical outcomes. Two studies I am aware of in the Australian context have not found the quality of the referral impacted ability to triage in an experimental trial (Br J Gen Pract. 2014;64(624), e419-25) and in real life (J Stroke Cerebrovasc Dis. 2015;24:874-80).

This manuscript is original in that it uses the TPS which is a scale the authors have developed and had been published.

Whether it is original and important enough for publication in this journal, is a decision for the editor.

The article makes sense and is readable and understandable.

Q: In regards to specific sections.
Introduction - End of first paragraph. Whilst I agree the referral letter is frequently the only available information when deciding on the patient priority to be seen, one would expect a consultation with the patient is also available before deciding on work up or treatment

A: Thank you for this input. It is true that many patients will see a specialist at a consultation before further workup, but in particular treatment. However, in numerous countries open access to endoscopic examination and treatment is current practice. Consequently, many patients are prioritized directly in to special investigations as colonoscopy/gastroscopy before further consultation. Additionally, blood-tests and urine/fecal analyses are frequently ordered based on the information in the referral letter before the first consultation. Though different approaches exist in different countries, in Norway and other Scandinavian countries, the initial steps in the specialist health care system are decided based on the content of the referral letter.

I have added a sentence in line 5 in the introduction (p. 4).

Methods
Q: Were there any inducements, payments, etc for GPs to participate?
A: No, there was no payment. One sentence has been added to line 18- 19in the methods section (p 5).

Q: Could you please provide more information on how the study team member facilitated communication with the vignette when needed?
A: By suggesting alternative phrasing of sentences when the vignette failed to understand the question of the GP. The vignettes were sensitive to spelling and to complex phrasing.
A sentence has been added on page 6, line 6-10.

Q: Was the investigator who scored all the referral letters blinded to whether it came from checklist support or standard referral? What cross scoring or checking was there?
A: No, the investigator was not blinded. This is a weakness of the study, and a sentence has been added in this respect in the methods (p 8, line 20-22) and the discussion (p 15, line 6-7) of the article.

Results
Q: It is stated that the inclusion was ended as the targeted N was met, but that is not consistent with the power estimation. There was over 50% drop out from randomisation, much of that between round 1 and 2. I am not sure how the 45 GPs included GPs was reached as different from the CONSORT flow chart (maybe it is the 55 randomised less the 10 who did not show up in round 1?).
A: The reviewer has a very reasonable comment. We stopped inclusion when we reached 45 GPs completing the first round. We expected some drop-out between the rounds, and therefore included more GPs than the minimum required. Also, as stated in the manuscript, we included the GPs as groups, and at some point we had several groups of GPs who volunteered to participate, resulting in a slightly higher number than estimated in the power estimation. We did not, however, expect as many drop-outs as we experienced, and after several reminders and calls to complete the task, we were very happy that we finally managed to get the required N of GPs to complete both rounds of the trial. If we had not succeeded, we would have had to continue recruiting GPs to reach the targeted inclusion. In each participating group, all group members were randomized before they attended the trial, but as it happened several times that group-members were prevented from showing at the designated time of the group, they were not included in the study. As the reviewer correctly pointed out, this is the reason for the difference between the n randomized and the n included in round 1. Some changes have been made on page 10, line 6-12 to clarify this aspect.

Q: Is there any data to compare the participant demographics with all Norway GPs or all GPs in the region?
A: We have searched the public records of GPs in Norway, and after a count, we have found that the average age of the GPs in the local community of Asker and Bærum counties is 50,8 years, and that 47% of the GPs are female. A sentence specifying this has been added to page 10, line 20-21.

Discussion
Q: In Figure 2 there is in each case one or more score that are worse with the checklists, have the authors analysed this and do they have any thoughts about why this may be the case?
A: The reviewer raises a good question. We don't have any scientific explanation for the drop in quality for some of the participants, but we can speculate that some GPs did not perform at an optimal level at one of the participations for some unknown reason. Possibly, this was due to time-constraints and lack of motivation for participation.

Strengths and limitations

Q: Given the standard referral TPS is higher than the validation study, could part of the reason be volunteer effect?
A: Indeed this is a possibility and a change in a sentence has been added to the discussion, p 15, line 2. However, this is unlikely to have influenced the result with regards to the effect of the intervention, due to the cross-over design.

Implications of the study
Q: Whilst as pointed out the effect of templates on referral letter quality is reasonably well documented, I would suggest that it is premature to suggest that EHR providers should be encouraged to include them until there is a clear link between checklists and more appropriate triage or clinical outcomes. The authors themselves in the unanswered questions point out that is unknown (and there is some literature I referred to earlier that checklists and referral quality does not improve outcomes).
A: This comment is very relevant and I have change a sentence to emphasize that RCTs are needed both to assess the impact on patient outcome and cost for the health care system.
A sentence has been added to page 15, line 25-28.

Q: I am also only seeing the CONSORT flow chart, not the checklist.
A: The checklist was uploaded as "Research checklist" in the file upload and does not show in the pdf proof. I have informed the editor in the cover letter, and if you want me to upload it as any other type of file I will be happy to do so. For now, I will leave it as it is, as the file designation appears to be the apprpriate one.

Reviewer: 2
Reviewer Name: Peter Vermeir
Institution and Country: Ghent university Hospital / Ghent University Belgium Please state any competing interests: None declared

Please leave your comments for the authors below

Q: This study addresses a topic of potential interest to readers of BMJ Open. The study has potential impact in that it informs GPs and hospital-based specialists about the importance of good referral letters. Congratulations with the resuls of your paper. It is clear that good communication between GPs and hospital-based specialists can reduce adverse events and makes healthcare more safe and transparant.
A: Thank you for your positive feedback!

Reviewer: 3
Reviewer Name: Mattijs E Numans
Institution and Country: LUMC dept Public Health and Primary Care, Leiden, the Netherlands Please state any competing interests: None declared

Please leave your comments for the authors below

Q: Very interesting and important study, not previously carried out and it adds to the knowledge of measuring and improving quality of referral communication. No major methodological concerns in my opinion. I agree that, although this are GI vignettes, these results might reflect results in other clinical domains. However, in evaluating the acceptance of such a referral supporting system among referring GPS, I seem to miss comparison of invested time fully. Is this something not measured? It might be one of the reasons GPS will or won't work with the system in the end, as is the case with many (other) eHealth or expert support systems.
A: Thank you for this comment! We did indeed measure the time the GPs spent on the referral task,

but these measurements were electronic logging that was also registered if the GP took a break from the referring. Additionally, the GPs spent extra time referring the patients due to the chat-functionality so the measurements are not accurate.
We believe that a pilot study in clinical practice will be the best way to evaluate the acceptability of the checklists for the GPs. The post-trial survey indicates that the checklists were acceptable to most GPs in the current form.

Q: Another point is the degree of integration of the referral support system into the GP's EHR. Is the referral letter generated straight from the EHR, how many practical steps are in between. I think both aspects (time and technical integration as thresholds between proven effect and successful implementation) should be appointed and discussed more intensively.
A: This is a very reasonable feedback as many extra steps in the generation of the referral letters will be frustrating for the GPs.
In Norway, referral letters are generated directly in the EHR of the GP and this requirement is therefore fulfilled. We believe that checklists must be closely integrated with the referral sheet/letter to be useful in clinical practice. This is a requirement mentioned as an important factor in clinical decision support systems.
A sentence has been added to the discussion p 13, line 24-30.

VERSION 2 – REVIEW

REVIEWER	Mattijs E Numans MD PhD, professor of general practice Leiden University Medical Centre, the Netherlands
REVIEW RETURNED	21-May-2017

GENERAL COMMENTS	I believe the questions raised by us as reviewers are adequately answered; the quality of the manuscript has been improved; it is interesting and original and imo it will be of interest to the readership of BMJ open, so I would suggest to accept it in its current form.