PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Development and evaluation of a hospital discharge information package to empower parents in caring for a child with a fever. A qualitative study exploring parents' views on, and experiences with managing their febrile child.
AUTHORS	van de Maat, Josephine; van Klink, Daphne; den Hartogh - Griffioen, Anine; Schmidt - Cnossen, Eva; Rippen, Hester; Hoek, Amber; Neill, Sarah; Lakhanpaul, Monica; Moll, Henriette; Oostenbrink, Rianne

VERSION 1 – REVIEW

REVIEWER	Senem Ayca Celal Bayar University School of Medicine Department of Pediatric Neurology TURKEY
REVIEW RETURNED	08-Feb-2018

GENERAL COMMENTS	It is a well designed study and it is very important to empower parents in the management of febrile child but I think the number of participants is inadequate for this study. It is a good idea to develope an information package about fever but in my opinion majority of the parents are concerned about the risk of febrile seizure especially at high degrees of fever. At the paediatric emergency practise febrile seizure history of child is the most common cause of ED admissions. I think that is the limitation of study that there is not any knowledge of febrile seizure history of children at the study.

REVIEWER	Pierluigi Marzuillo Università degli Studi della Campania "Luigi Vanvitelli"
REVIEW RETURNED	23-Feb-2018

GENERAL COMMENTS	This is an interesting study giving to the reader an idea about the parents' view on fever of their child and about the needs of knowledge about fever of parents. The authors developed an information package about fever in children that improved the parents' self-reported knowledge about fever and self-efficacy. A limitation that should be stated, in my opinion, is that the authors based the efficacy of the information package on a "self-reported increased knowledge about fever". Probably submitting the parents to a multiple-choice questionnaire evaluating the parents' knowledge about fever before and after reading the information package could have given a more accurate measure of the efficacy of the information package. It could be very interesting, if you have the possibility, to evaluate the efficacy of this information package throughout submitting another sample of parents to a multiple-choice questionnaire before and after reading information package.

	Pages 24-27: I suggest to translate these pages in English in order to permit that your efforts in develop this package could be useful for the worldwide colleagues not Dutch speakers.

REVIEWER	Kirsten Peetoom Maastricht University, the Netherlands
REVIEW RETURNED	09-Mar-2018

GENERAL COMMENTS	Summary BMJopen-2018-021697 The authors did an enormous effort to describe a two-phase study covering qualitative and quantitative work and provided a good overview of the steps undertaken to develop their intervention, an information package consisting of a leaflet and a website for parents with febrile children. Short summary This paper describes a two-phase mixed methods study consisting of qualitative and quantitative research within different care settings to develop and evaluate an information package on fever for parents. First, authors explored experiences and views of parents (children 0 – 16 years old) on managing their febrile child, and their needs towards information by means of semi-structured interviews. This part of the study was carried out in an acute hospital setting (ED) and non-acute hospital setting (outpatient department). Secondly, the authors developed and evaluated the intervention in a focus group discussion among parents (children 0 – 5 years old) attending a nursery, followed by a quantitative survey among parents from all three settings (N=38) to evaluate the newly developed intervention. The major finding was that parents experience difficulties in caring for their febrile child because they do not know when to consult a GP or ED. Reasons for help-seeking were symptoms as fever, behavior but also their gut feeling. Parents sometimes experience that doctors do not take their complaints seriously and this increases the threshold to seek help. Parents expressed a need to receive reliable and consistent information on when to consult the GP/ED and self-management strategies, in multiple formats. The researchers developed an information package that was well received by end-users and led to improvements in knowledge, self-efficacy, confidence in caring. Major comment MA1: This is not the first article on developing educational materials for parents on childhood fever. However, the authors do not mention in the Introduction and Discussion the existence of similar studies focusing supporting parents in coping with fever in similar settings. It is therefore not clear what this study wants to add to the current available literature, which studies they took into account to conduct this study, and how the results can be compared to other scientific work. I advise to include more relevant literature. For example, Monsma, Richerson and Sloand published an integrative review in 2015 on empowering parents for evidence-based fever management: An integrative review. For example, a literature review from Eefje de Bont et al. (2015) describes the effects of leaflets to inform patients about common infections during consultations in general practice. This review includes 8 studies describing the effects of leaflets. For example, a literature review from Kirsten Peetoom et al. (2016) describes the effects of informing parents prior to illness episodes on health-care seeking behavior and medication management. MA2: p4.21 [Introduction]: Is the statement ‘’at the same time, there

	are still children dying due to late help-seeking behaviour'' correct? To my understanding, this statement is not supported with the provided reference of Najaf-Zadeh (10) which focuses on malpractices in paediatricians and general practitioners. Parents are not mentioned. Minor comments MI1: The title only describes the development of the intervention and not the evaluation. MI2: Numbers <10 should be written out in words and not as numbers, ''five'' instead of ''5''. Avoid the short form of verbs such as: don't, shouldn't, won't. Abstract MI3: The section ''design'' mentions FGD two times while – according the methodology section in the main article- it was only performed in the evaluation phase. MI4: The section ''setting'' could be more specified and the ''non-acute hospital setting'' is now missing. Information on city and country would complement the description. MI5: The section ''outcome measures quantitative survey'' mentions a likert scale 1 -6 whilst it is 1 – 5 in this study. Methods The methods section provides, together with the supplementary materials, a detailed description of the methodologies used. MI6: the qualitative evaluation in the results section mentions that participants appreciated the traffic light system but this traffic light system is not described in the methods section. MI7: The methodology used in this study is extensively described. Nevertheless, I am missing a short explanation why the setting of ''nurseries'' was chosen for this study. It is briefly explained in the Discussion (p15.54/55) but can you elaborate more on this in the methods. Plus, why not in a GP practice? MI8: What I think is very positive about the development process in this study are the concepts (knowledge, self-efficacy) used from behavior change theories. I suggest to include a definition of these different concepts and to include relevant literature since - to my knowledge- ''self-efficacy'' and ''confidence in caring for a child'' are different wordings for the same phenomenon (see Bandura). MI9: The authors added the survey as supplementary file. I would suggest to clarify which questions cover ''knowledge'', ''self-efficacy'' and/or ''confidence in caring for a child''. M10: p.12.11 (results): ''and the literature''; Based on which literature was the information package developed? This is missing in the methods section. Results The authors provide a clear overview of the most important themes of the interview study and FGD and complement this overview with good quotes. Furthermore, they describe in short the results of the quantitative evaluation. MI11: p8.55: In this quote are the following words in parentheses: [the doctor at the ED, author]. It is not clear to me what is meant with ''author'' in these parentheses. MI12: p11.9: ''I won't call 911…'' The study is performed in Europe and the European emergency number is ''112''. US English is used but I suggest to change ''911'' in ''112'' and add in parentheses [European emergency number]. MI13: see MI6 regarding the traffic light system. The evaluation is described but not the development in the methods section.

	Discussion MI14: p14.8: ‘’we observed that parents in The Netherlands are concerned when their child has a fever’’. This statement has to be rephrased more cautiously because this statement cannot be made based on the current study with 22 interviews, 14 participating in a focus group and 38 quantitative surveys. MI15: p14.17 different wording is used than in results section. Playing was not mentioned in the results as symptom. MI16: p14.29: Figure 2 is mentioned in the Discussion for the first time. MI17: P15.6 A Dutch word is not translated into English, ‘’of’’ should be ‘’or’’. MI18: P15.8: Maybe or may be? MI19: P15.19-26: this information is missing in the methodology. MI20: The comparison with literature lacks interpretation of outcomes (knowledge, self-efficacy, confidence in caring). In addition, relevant literature regarding the evaluation of educational interventions on fever for parents (see also major comment) is lacking. MI21: P15.38-42: ‘’an asset…cultural background’’, this statement is not supported by the results or table 1. MI22: strength & limitations. There is no mention of the small sample used for the survey whilst this influences the interpretation of results. Also the small number of questions and its validity to measure knowledge, self-efficacy etc are not mentioned. M22: P16.17: Specify what you mean with ‘’clear discharge instructions’’. Hospital or ear discharge instructions? References MI23: please check the reference list because some references are not complete or correct (for example, reference 13). Table 1 MI24: The table is not easy to understand. Please indicate more clear how many parents attended which setting in the table. It is now not clear to me why you only provide the number of parents in the ‘’acute setting’’. Plus, are the parents from different settings comparable in terms of characteristics? This is not clear to me because this is not described in the results section or clear from this table. MI25: Be consistent in specifying the units of measurement. For example, median age of children is specified with ‘’y’’ in the separate columns for each type of study, whilst median age of parents is specified only in the left column. MI26: It is not clear to me how you measured ‘’median understanding Dutch language’’. Information package: folder and traffic light system MI27: these are in Dutch and will not be understandable to the non-Dutch readers. Is it possible to provide a summary of the folder and traffic light system in English? MI28: Trial registration number is missing

VERSION 1 – AUTHOR RESPONSE

Reviewer #1, Senem Ayca

Question1. It is a well-designed study and it is very important to empower parents in the management

of febrile child but I think the number of participants (a) is inadequate for this study. It is a good idea to develop an information package about fever but in my opinion majority of the parents are concerned about the risk of febrile seizure (b) especially at high degrees of fever. At the paediatric emergency practise febrile seizure history of child is the most common cause of ED admissions. I think that is the limitation of study that there is not any knowledge of febrile seizure history of children at the study.
Answer 1. We thank the reviewer for these comments.
a. Number of participants: For the qualitative study, we had reached the point of data saturation as mentioned in our methods, indicating sufficiently rich information and an adequate number of participants for our theory building qualitative approach. The results of the quantitative survey might have been more robust if we would have had more participants, a limitation we have added to our discussion (page 16, line 23). Still, since the emphasis of our study was on the qualitative part, we believe our conclusions are justified.
b. Febrile seizures: During the focus group discussion the parents' concerns were raised about seizures, after which we added information on this topic in our information package. We have elaborated on this issue more in our revised manuscript on page 12, line 25.

Reviewer #2, Pierluigi Marzuillo
Question1. This is an interesting study giving to the reader an idea about the parents' view on fever of their child and about the needs of knowledge about fever of parents. The authors developed an information package about fever in children that improved the parents' self-reported knowledge about fever and self-efficacy.
A limitation that should be stated, in my opinion, is that the authors based the efficacy of the information package on a "self-reported increased knowledge about fever (a)". Probably submitting the parents to a multiple-choice questionnaire evaluating the parents' knowledge about fever before and after reading the information package could have given a more accurate measure of the efficacy of the information package. It could be very interesting, if you have the possibility, to evaluate the efficacy of this information package throughout submitting another sample of parents to a multiple-choice questionnaire before and after reading information package.
Pages 24-27: I suggest to translate these pages in English (b) in order to permit that your efforts in develop this package could be useful for the worldwide colleagues not Dutch speakers.
Answer 1a. We agree with the reviewer that the quantitative survey would have been more robust if the knowledge of parents about fever had been tested more formally. Even though this would cover only one part of the evaluation – since self-efficacy and confidence would need other testing methods – this would certainly be an interesting topic for further research. We have added the self-reported character of our survey as a limitation in our discussion at page 16, line 23.
b. As the reviewer requests, we have translated the text of the leaflet into English and added this to the original supplement, in order to be understandable for non-Dutch readers. It should be noted that this was a forward-only translation (without expert panel, back-translation or testing), but it aims to give a good impression of the information package we developed.

Reviewer #3, Kirsten Peetoom
Major comment 1: This is not the first article on developing educational materials for parents on childhood fever. However, the authors do not mention in the Introduction and Discussion the existence of similar studies focusing supporting parents in coping with fever in similar settings. It is therefore not clear what this study wants to add to the current available literature, which studies they took into account to conduct this study, and how the results can be compared to other scientific work. I advise to include more relevant literature.
For example, Monsma, Richerson and Sloand published an integrative review in 2015 on empowering parents for evidence-based fever management: An integrative review.
For example, a literature review from Eefje de Bont et al. (2015) describes the effects of leaflets to inform patients about common infections during consultations in general practice. This review includes 8 studies describing the effects of leaflets.
For example, a literature review from Kirsten Peetoom et al. (2016) describes the effects of informing parents prior to illness episodes on health-care seeking behavior and medication management.
Answer 1. Question on the relation to current available literature.
We thank the reviewer for these questions and additions. It must be noted that our study was mainly focused on empowering parents with febrile children in the hospital (ED) setting. We have stated this more clearly in the title, abstract, our introduction (page 4) and conclusion. Also, we have included

more literature in the discussion of our findings by adding relevant references and elaborating more on this in a separate paragraph (page 15, line 27).
The work the reviewer refers to is mostly focused on general practice settings. There are several differences between the GP setting and hospital setting that are of importance for this research. From a healthcare perspective, there is a difference in the a priori risk of serious infections for ED and primary care settings, which influences the diagnostic value of clinical signs and symptoms of a child[1]; and the evaluation process of a child with a fever by the healthcare professional in these settings. From the parent's perspective, visiting the ED is usually a stressful experience, and they mostly encounter a doctor whom they do not know. All these factors influence the instructions that are needed by parents at the moment of hospital discharge. We believe this hospital perspective is of added value to the existing literature and that we stated this more clearly in our revised manuscript.

Major comment 2: p4.21 [Introduction]: Is the statement ''at the same time, there are still children dying due to late help-seeking behaviour'' correct? To my understanding, this statement is not supported with the provided reference of Najaf-Zadeh (10) which focuses on malpractices in paediatricians and general practitioners. Parents are not mentioned.
Answer 2. We agree with the reviewer that this statement was not completely correct. We intended to highlight the urgency of timely diagnosis in serious infection, but this is not only influenced by help-seeking behaviour. We have rewritten the sentence, now being more specific and supported by the reference (page 4, line 12)

Minor comments
Title
MI1: The title only describes the development of the intervention and not the evaluation.
A1: We have added evaluation.

MI2: Numbers <10 should be written out in words and not as numbers, ''five'' instead of ''5''. Avoid the short form of verbs such as: don't, shouldn't, won't.
A2: We corrected numbers under 10 if appropriate, and have written out the short forms in our main text. We kept the short forms in the citations of parents, reflecting the informal conversation.

Abstract
MI3: The section ''design'' mentions FGD two times while – according the methodology section in the main article- it was only performed in the evaluation phase.
A3: We agree with the reviewer that this was slightly confusing. The abstract was structured around the two aims of the study, whereas the methodology section was structured around the two phases of the study. We have rewritten the abstract to improve clarity (page 2).

MI4: The section ''setting'' could be more specified and the ''non-acute hospital setting'' is now missing. Information on city and country would complement the description.
A4: We have completed the description.

MI5: The section ''outcome measures quantitative survey'' mentions a likert scale 1 -6 whilst it is 1 – 5 in this study.
A5: We have corrected this consequently to 0-5 as was the original scale in the survey.

MI6: the qualitative evaluation in the results section mentions that participants appreciated the traffic light system but this traffic light system is not described in the methods section.
A6: We have added the traffic light system in the description of the information package in the methods section (page 5, line 11).

MI7: The methodology used in this study is extensively described. Nevertheless, I am missing a short explanation why the setting of ''nurseries'' was chosen for this study. It is briefly explained in the Discussion (p15.54/55) but can you elaborate more on this in the methods. Plus, why not in a GP practice?
A7: We have elaborated more on the choice of the nursery as the setting for our focus group (page 6, line 20). As mentioned now, this choice was based on this setting being more neutral and natural for parents than a medical setting, promoting free and rich conversation and to reduce the risk of social desirability bias. Besides the fact that our study was focused on parents in the ED rather than in general practice, the medical character of a GP practice would have been similar to a hospital setting.

MI8: What I think is very positive about the development process in this study are the concepts (knowledge, self-efficacy) used from behavior change theories. I suggest to include a definition of these different concepts and to include relevant literature since - to my knowledge- ''self-efficacy'' and ''confidence in caring for a child'' are different wordings for the same phenomenon (see Bandura).
A8: We thank the reviewer for the appreciation of using these concepts in our development and evaluation process. We have based our survey on the DIY Health project [2] (describing the impact of sessions instructing parents on minor illnesses), who in turn had used a guide for constructing self-efficacy scales by Bandura. We agree with the reviewer that the terms we used can be confusing, as self-efficacy is a broad term, defined by Bandura as one's belief in one's ability to succeed in specific situations or accomplish a task. In our context this is the parent's belief (or confidence) in their ability to care for their child when they have a fever. Self-efficacy and confidence are indeed directly related, whereas knowledge and skills are separate concepts. Parents may have the knowledge or skills, but still lack confidence in their ability to apply these when caring for their child.
Given that our survey items and their interpretation may overlap, we give in our revised manuscript the survey items separately, to present it more clear. In summarizing results we distinguish knowledge and confidence. We have numbered the separate items and in our methods we explain which items cover knowledge and confidence.

MI9: The authors added the survey as supplementary file. I would suggest to clarify which questions cover ''knowledge'', ''self-efficacy'' and/or ''confidence in caring for a child''.
A19: See A18.

M10: p.12.11 (results): ''and the literature''; Based on which literature was the information package developed? This is missing in the methods section.
A10: This was based on the NICE guideline and literature from the UK and general practice, for which we have added references in our methods section (p5, line 10).

Results
MI11: p8.55: In this quote are the following words in parentheses: [the doctor at the ED, author]. It is not clear to me what is meant with ''author'' in these parentheses.
A11: This was added to clarify that the author inserted the words in parentheses. But, since this apparently was confusing rather than clarifying, we have deleted this word.

MI12: p11.9: ''I won't call 911…'' The study is performed in Europe and the European emergency number is ''112''. US English is used but I suggest to change ''911'' in ''112'' and add in parentheses [European emergency number].
A12: We thank the reviewer for this suggestion and have adjusted it accordingly.

MI13: see MI6 regarding the traffic light system. The evaluation is described but not the development in the methods section.
A13: see A6

Discussion
MI14: p14.8: ''we observed that parents in The Netherlands are concerned when their child has a fever''.
This statement has to be rephrased more cautiously because this statement cannot be made based on the current study with 22 interviews, 14 participating in a focus group and 38 quantitative surveys.
A14: We have rephrased the statement, starting with 'Our observations suggest that', making it more cautious, as the original statement was indeed too strong.

MI15: p14.17 different wording is used than in results section. Playing was not mentioned in the results as symptom.
A15: We have changed the wording according to what was mentioned in the results section (p14, line 11).

MI16: p14.29: Figure 2 is mentioned in the Discussion for the first time.
A16: As Figure 2 is not purely a graphic presentation of the results, but includes some interpretation of the coherence of the results as well, we had decided to include it in the Discussion section. However, since we understand the confusion, we have adjusted this and inserted it at the end of the

results section under a separate heading 'thematic summary'. We believe this improved the clarity and flow of the article.

MI17: P15.6 A Dutch word is not translated into English, ''of'' should be ''or''.
A17: corrected.

MI18: P15.8: Maybe or may be?
A18: may be, corrected.

MI19: P15.19-26: this information is missing in the methodology.
A19: corrected, see M10.

MI20: The comparison with literature lacks interpretation of outcomes (knowledge, self-efficacy, confidence in caring). In addition, relevant literature regarding the evaluation of educational interventions on fever for parents (see also major comment) is lacking.
A20: see major comment and MI8.

MI21: P15.38-42: ''an asset…cultural background'', this statement is not supported by the results or table 1.
A21: Table 1 shows the diversity in terms of age, education, experience (number of children) and cultural background. There is great diversity in the first three aspects in all participants. The cultural background of the interviewees is diverse as well, supported by the fact that >40% of the interviewed parents had a non-Dutch background. In the FGD the cultural background was less diverse. To make this more clear, we added a short statement in brackets, to point out that the last aspect was only diverse in the interviews (16, line 10).

Strength & limitations
MI22: There is no mention of the small sample used for the survey whilst this influences the interpretation of results. Also the small number of questions and its validity to measure knowledge, self-efficacy etc are not mentioned.
A22: As this was noted by the first reviewer as well, we agree that this limitation should have been mentioned. We added comments on limitations of sample size and measurement of the outcomes (page 16, line 23).

M22: P16.17: Specify what you mean with ''clear discharge instructions''. Hospital or ear discharge instructions?
A6. We were not aware this term would lead to confusion, and we have adjusted it to the more specific "clear hospital discharge instructions".

References
MI23: please check the reference list because some references are not complete or correct (for example, reference 13).
A23: We have checked the references to be correct.

Table 1
MI24: The table is not easy to understand. Please indicate more clear how many parents attended which setting in the table. It is now not clear to me why you only provide the number of parents in the ''acute setting''. Plus, are the parents from different settings comparable in terms of characteristics? This is not clear to me because this is not described in the results section or clear from this table.
A24: We have redesigned this table to improve clarity. Moreover, we have elaborated more on the characteristics of the participants in the Results section (heading 'participants', page 8, line 6).

MI25: Be consistent in specifying the units of measurement. For example, median age of children is specified with ''y'' in the separate columns for each type of study, whilst median age of parents is specified only in the left column.
A25: Thank you for pointing out these inconsistencies, we have adjusted these.

MI26: It is not clear to me how you measured ''median understanding Dutch language''.
A26: This was measured on a scale from 0 – 10 (0 indicating no understanding of Dutch, 10 indicating perfect understanding of Dutch). We have added this more detailed explanation to the table.

Information package: folder and traffic light system
MI27: these are in Dutch and will not be understandable to the non-Dutch readers. Is it possible to provide a summary of the folder and traffic light system in English?
A27: As this was also mentioned by the first reviewer, we have translated the text of the leaflet into English, to give an impression of the information package.

MI28: Trial registration number is missing
A28: This is not applicable, since our study was not registered in a trial registry.

1. Van den Bruel A, Haj-Hassan T, Thompson M, Buntinx F, Mant D, European Research Network on Recognising Serious Infection i. Diagnostic value of clinical features at presentation to identify serious infection in children in developed countries: a systematic review. Lancet. 2010 Mar 06;375(9717):834-45. PubMed PMID: 20132979.
2. Gerressu M. E-CJ, Deighton J. DIY Health Evaluation Report. 2015.

VERSION 2 – REVIEW

REVIEWER	Pierluigi Marzuilo Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy
REVIEW RETURNED	30-Apr-2018

GENERAL COMMENTS	All my concerns have been addressed

REVIEWER	Kirsten Peetoom Maastricht University, The Netherlands
REVIEW RETURNED	03-May-2018

GENERAL COMMENTS	The author's revised the manuscript according the reviewer comments and this improved the quality of the manuscript significantly. I have some small comments to finish the paper: - "don't" is in the main text and should be written as "do not" (Discussion) / "shouldn't should be written as "should not". Please check the whole text on this. This is not needed for the quotes. - reference 6 is mentioned twice in "references" and one is empty. This was also the case in the previous version so please adapt. - Overall: adjust lay-out of "References". - reference 35 is too general stated with no specification on where to find the information on women being the primary caregivers in The Netherlands. - in the previous version was a reference provided regarding the newspaper article to recruit participants. This one is missing in the new version while the statement is still part of the manuscript. Good luck with the final adjustments.

VERSION 2 – AUTHOR RESPONSE

Reviewer #2, Pierluigi Marzuillo had no concerns left.

Reviewer #3, Kirsten Peetoom

- We have checked the whole text and corrected don't into 'do not', etc.
- We have double checked reference number 6 and made sure it was only mentioned once in the references. However, due to the layout in this Word-document, the last character of reference number 5 (being a 6, by chance) appears on a separate line. This makes it look like a separate and empty reference. We trust this will not happen in the final publication.
- Layout of the references has been adjusted.
- Reference 35 has been updated and made more specific.
- We added the newspaper reference.