

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	The effect of promoting current local research activities on large monitors on the population's interest in health-related research – a randomized controlled trial
<b>AUTHORS</b>	Gunnarsson, Ronny; Cullen, Paul; Heal, Clare; Banks, Jennifer

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Naiya Patel Long Island University Brooklyn, NY, United States
<b>REVIEW RETURNED</b>	11-Jul-2018

<b>GENERAL COMMENTS</b>	<p>The overall quality of the manuscript is good except for few minor changes like-</p> <ul style="list-style-type: none"><li>1- missing keywords in the abstract and minor restructuring of the abstract.</li><li>2- grammatical errors etc</li></ul> <p>The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.</p>
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<b>REVIEWER</b>	Raina Merchant University of Pennsylvania, USA
<b>REVIEW RETURNED</b>	23-Jul-2018

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review the manuscript: A proactive information strategy can increase the population's interest in health-related research – a randomized controlled trial.”</p> <p>The authors aimed to evaluate how TV displays in an ER waiting room could influence the publics' interest in health-related research. The study design is interesting and the concept offers promise for identifying insights about how the public consumes information. This also has value for understanding different modes of information delivery about health related research that could impact public participation. Considering the low enrollment in many clinical trials and the potential value for better engagement of patients in research the premise and approach for this study are interesting. The authors are to be commended for a clever study design and execution.</p> <p>There are several significant limitations that impact the scalability and interpretability of the paper:</p> <p>Potential confounders that may have explained the differences in the control and intervention are not entirely detailed in the</p>
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	<p>manuscript. It's unclear if the findings represent a significant change attributable to the TV screen. No details are provided about the content and types of studies displayed and other approaches for public awareness taken on by these studies ( did they have billboards, flyers, psa's etc.) Did any of the researches report that someone from the ED followed up for study enrollment or inquiry based on what was displayed in the ED? Was there an attempt to display the content on the ED TV screens differently then in other places that would allow for tracking of what was shown in the ED compared with what might have been on a flyer or other recruitment material? ( the example screen shot has a qr code).</p> <p>Further, its unclear if the results sustained or transient---patients were surveyed at one time point in a waiting room but not after. This makes it difficult to assess if their sentiments were related to what was placed in front of them immediately and if this would be consistent if they were asked at a different subsequent time point.</p> <p>The conclusion" Proactively pushing information about current local health-related research to the general population using large TV screens increased their interest in health-related research" is not supported in its entirety by the data. It also does not follow that this is related to actual patients' enrollment in a clinical trial (as inferred in the conclusion).</p> <p>The statement "This is the first study of its kind aiming to actively increase the adult populations' interest in health-related research" may be overstepping as I would assume the communications and marketing research would specifically address this. Adding some of the work from those areas may be helpful.</p> <p>The statement in the intro also seems similarly bold and I would recommend softening or acknowledging similar related work "There are, to date, no studies presented in peer reviewed scientific publications evaluating different approaches to influence the general populations' interest in health-related research.</p> <p>Other feedback:</p> <p>The question: how interested are you in health or medical research seems rather abstract and doesn't control for prior exposures of the participant ( potentially impacted by comorbidity, experience of friends/family in research).</p> <p>The presence of the TV screen doesn't mean that everyone saw it or observed any of the content. "How interesting do you find the information? (Response alternatives: Not at all, somewhat, very)." This question doesn't get why the information might be considered interesting (personally relevant condition, differences in display, connection with real world events, controversial area, stigmatized area etc)</p> <p>In the methods, the age/race/gender of the medical student interviewees is not provided</p> <p>The timing of when the questions were asked is not described. Crossover between the two sites of patients/family members who may have been exposed to the intervention at the other hospital is not described</p>
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	<p>The specifics of what “health related research” was were not described—this could have been defined loosely but this may have differed across institutions</p> <p>Additional detail about potential age/gender differences should be expanded further. The current explanation is insufficient</p> <p>The comment about generalizability to all of Australia based on a small convenience sample seems overstated. “Hence, we can expect that the finding that the intervention is effective can reasonably be generalized to all of Australia as well as other high-income countries.”</p> <p>There are multiple grammatical errors throughout that would be beneficial to correct.</p>
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## VERSION 1 – AUTHOR RESPONSE

### Reviewers' Comments to Author:

Reviewer: 1

Reviewer Name: Naiya Patel

Institution and Country: Long Island University Brooklyn, NY, United States

Please state any competing interests or state 'None declared': None Declared

See file attached.

The overall quality of the manuscript is good except for few minor changes like-

- 1- missing keywords in the abstract and minor restructuring of the abstract.
- 2- grammatical errors etc

Reviewer: 2

Reviewer Name: Raina Merchant

Institution and Country: University of Pennsylvania, USA

Please state any competing interests or state 'None declared': None

Thank you for the opportunity to review the manuscript: A proactive information strategy can increase the population's interest in health-related research – a randomized controlled trial.”

The authors aimed to evaluate how TV displays in an ER waiting room could influence the public's interest in health-related research. The study design is interesting and the concept offers promise for identifying insights about how the public consumes information. This also has value for understanding different modes of information delivery about health related research that could impact public participation. Considering the low enrollment in many clinical trials and the potential value for better engagement of patients in research the premise and approach for this study are interesting. The authors are to be commended for a clever study design and execution.

There are several significant limitations that impact the scalability and interpretability of the paper:

Potential confounders that may have explained the differences in the control and intervention are not entirely detailed in the manuscript. This was a randomized study and the main purpose of using this

design is to reduce the risk of confounding factors influencing the difference between groups. The reviewer does not clearly state what other factors they would like us to adjust for. We controlled for gender, ethnicity and socioeconomic standard. We can more clearly explain in the manuscript that we did control for these variables.

It's unclear if the findings represent a significant change attributable to the TV screen. If the TV screen was turned on or off was the only change made between groups in this randomized trial. We could prove a statistical difference between groups rejecting the null hypothesis that turning on or off the TV screens makes no difference. This was the study design and the most plausible explanation is that the TV screens made a difference. We could elaborate further on this in the discussion.

No details are provided about the content and types of studies displayed and other approaches for public awareness taken on by these studies ( did they have billboards, flyers, psa's etc.) Did any of the researches report that someone from the ED followed up for study enrollment or inquiry based on what was displayed in the ED? Was there an attempt to display the content on the ED TV screens differently then in other places that would allow for tracking of what was shown in the ED compared with what might have been on a flyer or other recruitment material? ( the example screen shot has a qr code). We agree with the reviewer that the type of projects displayed on the TV screens and the absence of any other information such as flyers or TV screens in other places should be explained better in the manuscript. This can easily be added. The information displayed at the two hospitals were, for the purpose of this study, identical.

Further, its unclear if the results sustained or transient---patients were surveyed at one time point in a waiting room but not after. This makes it difficult to assess if their sentiments were related to what was placed in front of them immediately and if this would be consistent if they were asked at a different subsequent time point. We agree with the reviewer that this uncertainty remains but this is also discussed in the manuscript. It was never the intention of this study to investigate long term effects, only if there was any immediate effect. Proving an immediate effect (this study) may provide the incentive for a follow up study focusing on long standing effects.

The conclusion" Proactively pushing information about current local health-related research to the general population using large TV screens increased their interest in health-related research" is not supported in its entirety by the data. It also does not follow that this is related to actual patients' enrollment in a clinical trial (as inferred in the conclusion). We did a multilevel multivariate analysis of data and in our opinion the data do support that proactively pushed information had an immediate effect. We would like the reviewer to clarify more in detail why the reviewer perceive that the data does not support that conclusion. We already discuss that the immediate effect on attitude towards health-related research does not necessarily mean that more patients enrol into clinical trials and that was never the intention of the study to investigate that.

The statement "This is the first study of its kind aiming to actively increase the adult populations' interest in health-related research" may be overstepping as I would assume the communications and marketing research would specifically address this. Adding some of the work from those areas may be helpful. We searched extensively and still believe there are no previous studies trying to change adults attitudes towards health-related research. There is of course a lot of research around marketing to increase sales of a specific product. We agree with the reviewers that it would be of value to mention this in the introduction and also to cite a few of these references. We intend to do so.

The statement in the intro also seems similarly bold and I would recommend softening or acknowledging similar related work "There are, to date, no studies presented in peer reviewed scientific publications evaluating different approaches to influence the general populations' interest in health-related research. Please see the comment above.

#### Other feedback:

The question: how interested are you in health or medical research seems rather abstract and doesn't control for prior exposures of the participant (potentially impacted by comorbidity, experience of friends/family in research). Controlling for confounding factors can be done by extensive surveys asking about comorbidities, experience of friends and family and other potential factors as suggested by the reviewer. The randomized design should largely address the problem with confounding factors. We also deemed that having a more extensive survey would make the response rate drop to be very low and that would have been counterproductive. We did put in a substantial effort in getting a reasonable response rate and achieved 69%. A more extensive survey would have seen the response rate drop significantly compared to the very simple survey we deployed. We think our choice was the right one for this first of its kind study.

The presence of the TV screen doesn't mean that everyone saw it or observed any of the content. "How interesting do you find the information? (Response alternatives: Not at all, somewhat, very)." This question doesn't get why the information might be considered interesting (personally relevant condition, differences in display, connection with real world events, controversial area, stigmatized area etc) We agree with the reviewer that it was unlikely that all persons saw the TV screen and this would reflect reality. Hence, in reality if we put up TV screens where only a part of people passing by see it would it still have an immediate effect? Our study suggest it would. It was beyond the scope of this study to clarify why the TV screens might have been perceived as interesting. That would be a good topic for a follow-up study using a qualitative approach (and we will suggest that in the revised discussion).

In the methods, the age/race/gender of the medical student interviewees is not provided The subjects were not interviewed. They were simply asked if they wanted to participate in a short one page written survey. Hence, we deem the age, gender and ethnicity of the medical students asking for participation to be less relevant. We can try to retrieve this information and add it if deemed important (this might be a big issue in the US compared to Australia).

The timing of when the questions were asked is not described. We agree that this is insufficiently described. We have more information about timing and there is no problem in elaborating more in detail about this.

Crossover between the two sites of patients/family members who may have been exposed to the intervention at the other hospital is not described We agree that this is important information and it is our intention to comment on this in the revised manuscript. The two participating hospitals were located 736 kilometers from each other so crossover is highly unlikely.

The specifics of what "health related research" was were not described—this could have been defined loosely but this may have differed across institutions For the purpose of the study we displayed exactly the same health-related research in both hospitals. We agree that a better description of what health-related research embraced should be made and we intend to do so.

Additional detail about potential age/gender differences should be expanded further. The current explanation is insufficient It is unclear to what extent the current information about age and gender differences are insufficient and we would like the reviewer to be more specific. Age and gender differences are clearly described in table 1.

The comment about generalizability to all of Australia based on a small convenience sample seems overstated. "Hence, we can expect that the finding that the intervention is effective can reasonably be generalized to all of Australia as well as other high-income countries." The sample was collected

consecutively rather than as a convenience sample. The sample has a similar gender distribution as Australia overall. Furthermore, the sample has a socioeconomic standard that is very close to the Australian average. We agree with the reviewer that we should soften the conclusion about generalizability. However, we still believe the result is of interest to an international audience.

There are multiple grammatical errors throughout that would be beneficial to correct. Reviewer 1 attached a pdf file with multiple grammatical suggestions. We are thankful for that and intend to adopt most (if not all) of them. Some of these comments are related to if US English or UK English should be used.

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Bev J Holmes Simon Fraser University and University of British Columbia, Canada
<b>REVIEW RETURNED</b>	10-Feb-2019

<b>GENERAL COMMENTS</b>	<p>Thanks for the opportunity to review this paper. Interesting and important topic. I think you have done a very thorough job in responding to the initial reviewers' comments and I commend you for challenging the rejection. The only thing I remain surprised about is that you haven't drawn on the really rich health communications literature, including years' worth of excellent articles - many relevant even if not literally on the same topic (support for health research) - in the journal Public Understanding of Science. For your background, you've relied on one or two (not very new) studies about the public's interest in and acceptance of research, but there is more, for example Research Canada does regular public polls, and there is some interesting work underway on how to get the public more interested in clinical trials. On another topic, communications and marketing literature is full of relevant studies (what type of message resonates with whom for what) - you note that fact but do not design your project based on what is known about how the public reacts to and comes to support - or doesn't - messaging about the topic at hand. In effect, you start from scratch with an idea. Having said this, I don't think that matters for this study, which again is interesting and promising, if early (as you note). But if you do move ahead building on this work, it would be wonderful to test messages and format and so on based on evidence already established in health and research and related communications and marketing. Those of us working to increase the public's interest in health research would be very interested!</p> <p>A last comment is that there are still quite a number of grammatical errors, which I assume would be corrected through the editing process (they're not a result of different countries' spellings).</p> <p>Thank you again and all the best.</p>
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<b>REVIEWER</b>	Andrew Hinde University of Southampton United Kingdom
<b>REVIEW RETURNED</b>	25-Feb-2019

<b>GENERAL COMMENTS</b>	<p>I have been asked to look at the revised version of this manuscript. I guess my opinion has been sought because the two reviewers of the original submission disagreed. As some of the disagreement related to the statistical methods you used and the design of the study, I have been asked to focus on these.</p> <p>My view is that the revised version of the paper has addressed the concerns of Reviewer 2 of the previous version that I think are legitimate. The authors' response to the remaining points seems sensible to me. Therefore I am inclined to support publication, subject to further clarification of three points.</p> <p>1. The description of when the questionnaire was administered is still a bit unclear (Reviewer 2 of the original submission asked for more clarity on this). On p. 9, l. 22 you write '[a]fter the monitor was turned on, they were also asked ...'. Initially I did not know how to interpret this. I hope that what you did was to hand out a one-page survey to patients in both centres in all three phases. When there was no television (or a television which was not turned on), which is in both centres in Phase 1, and in Cairns in Phase 2, the questions related to age, gender, postcode and 'How interested are you in health and medical research'. When the television was showing news of medical research, which is in Mackay in Phases 2 and 3 and in Cairns in Phase 3, the questionnaire included an additional question about what was on the television. Can you confirm this, and maybe emphasise that each person only actually received one questionnaire. The phrase '[a]fter the monitor was turned on' initially had me thinking that you gave each person two questionnaires (before and after the television was turned on), or that you sampled patients in each centre twice, once before you turned the television on, and once afterwards.</p> <p>2. The sample size calculations on p. 11 assume a population of 20,000. Is this reasonable for the places where the hospitals were located? What is the catchment population? If it is substantially more than 20,000, you will need more than 938 and 1,428 responses (up to a maximum of 983 and 1,535 if the population is infinite).</p> <p>3. In table 1, the numbers in brackets for the variables 'age' and 'socioeconomic index' are not defined (are they standard deviations?).</p> <p>Minor typographical errors. I was not looking out for these, but it seems worth pointing out those I did spot.  p. 5, l. 5 'taxes spend' should be 'taxes spent'.  p. 6, ll. 1-4 These lines could be more clearly written as follows:  'This project aims (a) to estimate people's interest in health-related research, (b) to establish the extent to which people appreciate being actively informed about current local health-related research and (c) to discover if the level of people's interest can be influenced ...'  p. 14, l. 1 'that s few' should be 'that a few'.</p>
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	Table 2, notes. You have two notes 'a'. The second one should be 'b'.
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## VERSION 2 – AUTHOR RESPONSE

#1: Thanks for the opportunity to review this paper. Interesting and important topic. I think you have done a very thorough job in responding to the initial reviewers' comments and I commend you for challenging the rejection.

Author response: We appreciate this positive remark.

#1: The only thing I remain surprised about is that you haven't drawn on the really rich health communications literature, including years' worth of excellent articles - many relevant even if not literally on the same topic (support for health research) - in the journal Public Understanding of Science. For your background, you've relied on one or two (not very new) studies about the public's interest in and acceptance of research, but there is more, for example Research Canada does regular public polls, and there is some interesting work underway on how to get the public more interested in clinical trials. On another topic, communications and marketing literature is full of relevant studies (what type of message resonates with whom for what) - you note that fact but do not design your project based on what is known about how the public reacts to and comes to support - or doesn't - messaging about the topic at hand. In effect, you start from scratch with an idea.

Author response: The journal Public Understanding of Science was a pleasant surprise. We thank the reviewer for bringing our attention to this journal. It widened our horizon a bit. As a consequence, we added a paragraph in the discussion where we also cite two publications from this journal.

#1: Having said this, I don't think that matters for this study, which again is interesting and promising, if early (as you note). But if you do move ahead building on this work, it would be wonderful to test messages and format and so on based on evidence already established in health and research and related communications and marketing. Those of us working to increase the public's interest in health research would be very interested!

Author response: We appreciate this positive remark and will move forward if we can find reasonable funding. We also believe the next step would be studies in international collaboration.

#1: A last comment is that there are still quite a number of grammatical errors, which I assume would be corrected through the editing process (they're not a result of different countries' spellings). Thank you again and all the best.

Author response: We have done our best to identify and fix up grammatical errors.

#2: I have been asked to look at the revised version of this manuscript. I guess my opinion has been sought because the two reviewers of the original submission disagreed. As some of the disagreement related to the statistical methods you used and the design of the study, I have been asked to focus on these. My view is that the revised version of the paper has addressed the concerns of Reviewer 2 of the previous version that I think are legitimate. The authors' response to the remaining points seems sensible to me. Therefore I am inclined to support publication, subject to further clarification of three points.

Author response: We appreciate this positive remark supporting publication.



#2: 1. The description of when the questionnaire was administered is still a bit unclear (Reviewer 2 of the original submission asked for more clarity on this). On p. 9, l. 22 you write '[a]fter the monitor was turned on, they were also asked ...'. Initially I did not know how to interpret this. I hope that what you did was to hand out a one-page survey to patients in both centres in all three phases. When there was no television (or a television which was not turned on), which is in both centres in Phase 1, and in Cairns in Phase 2, the questions related to age, gender, postcode and 'How interested are you in health and medical research'. When the television was showing news of medical research, which is in Mackay in Phases 2 and 3 and in Cairns in Phase 3, the questionnaire included an additional question about what was on the television. Can you confirm this, and maybe emphasise that each person only actually received one questionnaire. The phrase '[a]fter the monitor was turned on' initially had me thinking that you gave each person two questionnaires (before and after the television was turned on), or that you sampled patients in each centre twice, once before you turned the television on, and once afterwards.

Author response: We did as the reviewer hoped we did. We made some minor changes in the methods section to clarify this.

#2: 2. The sample size calculations on p. 11 assume a population of 20,000. Is this reasonable for the places where the hospitals were located? What is the catchment population? If it is substantially more than 20,000, you will need more than 938 and 1,428 responses (up to a maximum of 983 and 1,535 if the population is infinite).

Author response: The reviewer is correct in that we missed to consider the size of the catchment population. The theoretical catchment population for both hospitals would be around 300 000 people. However, these hospitals cover large rural areas also having several smaller hospitals and primary health care centres where patients usually attend. Hence, most of this theoretical population would never end up in the emergency waiting room in these two hospitals. They would be brought in by ambulance helicopter or an ordinary ambulance transport and unlikely to be put in the waiting room. A more reasonable estimation would be that the population with a reasonable probability of ending up in the waiting rooms are closer to 100 000. This means the sample size estimation end up in 974 and 1514. We collected surveys from 1501 persons so it means we would be 13 persons short. We consider this difference being insignificant so we did not make any changes to the manuscript. However, we will do that if the editor requires us to do so.

#2: 3. In table 1, the numbers in brackets for the variables 'age' and 'socioeconomic index' are not defined (are they standard deviations?).

Author response: We added a footnote explaining that SD means standard deviation.

#2: Minor typographical errors. I was not looking out for these, but it seems worth pointing out those I did spot: p. 5, l. 5 'taxes spend' should be 'taxes spent'. p. 6, ll. 1-4 These lines could be more clearly written as follows: 'This project aims (a) to estimate people's interest in health-related research, (b) to establish the extent to which people appreciate being actively informed about current local health-related research and (c) to discover if the level of people's interest can be influenced ...' p. 14, l. 1 'that s few' should be 'that a few'.

Author response: We appreciate being pointed to these typographical errors. We have adopted the reviewer's suggestions.

Table 2, notes. You have two notes 'a'. The second one should be 'b'.

Author response: Thank you for pointing out this mistake. We adjusted it.

#2: The in text citation for 'figure 2' is missing on your main text of your main document file. Please amend accordingly.

Author response: In the first paragraph of the results section we accidentally referred to “Figure 1” but that is now changed to “Figure 2”. Thanks for pointing us to this mistake.

#2: Please embed your COMPETING INTERESTS STATEMENT in your main document file as shown in ScholarOne.

Author response: (We are unsure if this comment was provided by the editor or reviewer) The section “Declaration of interest” has been relabelled as “Competing interest statement”. A sentence at the end of this section was added clarifying competing interest.

### VERSION 3 – REVIEW

<b>REVIEWER</b>	Andrew Hinde University of Southampton United Kingdom
<b>REVIEW RETURNED</b>	07-May-2019
<b>GENERAL COMMENTS</b>	I am happy that the authors have addressed the few concerns I had with the previous version. This is a very useful contribution now: I am pleased that the authors challenged the original rejection.