

Article details: 2017-0090	
Title	Choosing Wisely Canada STARS (Students and Trainees Advocating for Resource Stewardship): a descriptive study of a student-led campaign to advance resource stewardship in medical education
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Reviewer 1	Dr. Brett Schrewe
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General comments (author response in bold)	<p>1. Abstract</p> <p>I thought this was reasonably well-written for a general audience. Furthermore, the flow was reasonable and was pretty easy to follow. Reading it made me think that when I move into the body of the paper, I will learn more about the emergence and current state of resource stewardship education in Canadian medical faculties, why it might be important, how it has been approached, what your initiative might add to it, what experience has been so far, and how your current findings might orchestrate further research.</p> <p>Thank you.</p> <p>2. Introduction</p> <p>A clear intro sentence, which is good. But I would reference it, as I imagine it is easily found (and really should be since it is a group whose work the authors are drawing upon). That led me to notice that references start with 5 and 6; is it possible the authors eliminated an introductory paragraph and the four references that went with it? If so, how come? That made me kind of confused, honestly.</p> <p>Thank you for this astute observation – we did in fact inadvertently delete references from an early version during the editing process prior to submission. We have revised the reference section to reflect some text that was previously eliminated and new additions.</p> <p>3. Also, I assume they are referring to Key Competency 2 in the Leader section in their first paragraph, but this is for some reason also not referenced. While I'm assuming CMAJ Open readers are probably majority Canadian, I wouldn't make the assumption everyone knows what CanMEDS is without a reference (or a spelling out of its acronym). Is there not yet content because Competence By Design hasn't been implemented yet in most places and programs?</p> <p>We have modified the sentence to make more clear what CanMEDS is and added a reference # 3 as well.</p> <p><i>"In addition, the Royal College of Physicians and Surgeons of Canada updated its CanMEDS competency framework in 2015, and now clearly identifies resource stewardship as a key physician competency within the 'Leader' role that must be addressed in residency training."</i></p> <p>[Page 4]</p> <p>You are also correct that the changes to CanMEDS were relatively recent and CBD is still in its earliest stages of implementation, which may explain why training has lagged behind. Therefore, saying 'despite this, many medical schools and residency programs...' may not be appropriate. We have modified slightly to now read:</p> <p><i>"However, given that these changes are relatively recent, many Canadian medical schools' curriculums and residency programs do not have consistent content on resource stewardship (4,5)."</i></p> <p>[Page 4]</p> <p>4. I'm honestly just curious – they reference a study using a survey that seems to draw exclusively from US medical students; is there enough of a parallel between their system and ours such that those attitudes can be extrapolated to our context?</p> <p>We agree that there are differences in the US and Canadian contexts; unfortunately, no such data exists regarding Canadian medical students. However, we do believe that US students' attitudes towards high-value care could be extended to Canada, given that other surveys that we have conducted (non-published data) found that physicians in Canada believe that they have an important role to play in reducing unnecessary tests and treatments.</p> <p>5. I thought things were then reasonable until the second paragraph, but I was confused again by the reference in the first line "The CWC medical education strategy follows a grassroots approach, consistent with the overall campaign strategy"...and then the authors referenced a 2003 article from some of Delese Wear's work with Medical Students for Choice (which is a group that works to promote abortion provider education in medical schools and addresses gaps, et cetera). From what I can tell from reading its abstract, it seems like the study's approach might be similar to what I read in this article's abstract, but that was the only link I could make between CWC and MSFC...therefore this line is really confusing to me.</p> <p>We agree that the second paragraph is quite confusing, including the reference to an unrelated medical student campaign regarding Students for Choice. We have made significant changes to this paragraph, including removal of the reference mentioned by Reviewer #1, to try and make the message more clear.</p> <p>6. By the end of the section, I felt like things were more or less back on track but a few other things threw me. One, I was curious if "students and trainees" referred to medical students and residents, and if so, why there weren't any residents included by the campaign. But perhaps I will find out more about that as I read on. Further, what felt confusing is that the abstract said that this was a paper about evaluation. But now in the body of the text I am told that it is a descriptive study of not just evaluation, but also implementation.</p> <p>We wanted the campaign to be inclusive of all learners – 'students' would capture learners in all health professions training (including medicine, nursing etc.), and trainees would capture learners in residency programs. This would allow for the potential to expand efforts to other learner groups.</p> <p>We deliberately chose to target medical students because it would allow us the greatest opportunity to reach the largest number of learners in all 17 medical schools, while still keeping the program feasible (i.e., residency training is quite distributed across dozens of specialty programs at each school, and so it is much harder to identify 1-2 resident representatives from each University who could then go back and reach a broad range of postgraduate learners)</p> <p>7. Methods</p> <p>Based on the above comments about what this paper is talking about, I wonder if the authors need to make a clear choice. Either the paper is laid out as both implementation/intervention and evaluation from the start, or the former is folded into the introduction to set up a descriptive study of the evaluation. At this point, the inclusion of the table before any of the text – to me – is confusing and I wonder if it is better as an appendix (honestly, though, that might just be a personal preference!).</p> <p>We have tried to make the objectives more explicit by including the following sentence at the end of the Introduction section:</p> <p><i>"The main objectives of this descriptive study are 1) to describe how the STARS campaign was implemented; 2) to</i></p>

summarize the STARS student-led Choosing Wisely initiatives; and 3) to identify systemic facilitators and barriers encountered by STARS students that could guide the improvement of the STARS campaign to optimize its impact."
[Pages 4 & 5]

8. Irrespective of where it might slot in, the intervention section is reasonably well-written, and I understood the selection process. There are small things that need to be addressed here and there (a sentence fragment with "rationale being", some comma use, and I don't think Deans should be capitalized?)
Based on Reviewer #1 feedback, to improve the flow of the paper, we have moved the intervention section into a Box. If this is inconsistent with the journal style, we would be happy to re-insert it into the text of the paper. However, we would advocate for the Box to be included in the actual paper and not an online appendix, as it is central to the reader's understanding of the STARS campaign. We have also addressed the minor grammatical suggestions.

9. I understood the goals of the leadership summit easily. I did wonder about what they meant by "national community of practice", as CoP seems to be becoming a term used frequently in medicine and medical education and increasingly away from Wenger's original description of it. As a qualitative researcher, I just wondered what they meant by it, but again, imagine it will be described later on in some detail.
We agree that our campaign's attempt to foster inter-connectedness between STARS students does not fit Wenger's original description of 'community of practice'. In truth, we have actually tried to promote a pan-Canadian network of students – and so we have modified the manuscript to remove the term 'community of practice' and instead refer to a 'network' of STARS students

10. Program Evaluation
To me, this is the part where Methods probably should begin in earnest. I thus feel like there might be a need for some re-organization of this paper, as touched on above. I thought this paragraph was a bit vague, honestly. What sort of change did they hope to capture with their survey tool, for example? Local change? Systemic change? What sort of barriers? Is there anyone else in the literature who has looked at student-led initiatives such as this that might have helped contextualize their approach, shaped what they wanted to find out from their survey and interviews, et cetera?
We agree with Reviewer #1 comments and have now started the Methods section with this part of the paper (and made some changes to the headings and organization based on the Editor comments above. We realize that the term 'change' is vague, and to align with the overall purpose of the study now more clearly stated, our hope was to summarize the STARS student-led Choosing Wisely initiatives at the different schools. The sentence now reads:
"The survey administered to the STARS students included questions that asked them to describe the initiatives that they implemented or planned to implement at their local medical schools to promote resource stewardship."
[Page 7]
The barriers were to their ability to implement their STARS student-led initiatives, and modified as follows:
"We pilot-tested the survey with three past CWC summer students and modified based on discussion."
[Page 7]
We did perform a detailed literature search at the outset, but did not find an obvious example of a prior evaluation that we could refer to.

11. Data Collection
Participant sampling as done is justified and reasonable. The authors talk about a structured survey, then pivot to a brief mention of interviewing deans, then go back to the survey. I might suggest reorganizing this because it felt a bit hard to follow (i.e., include the deans' interviews after describing the survey in-depth)
We have now moved the description of how we collected data from the deans to as recommended to improve flow.

12. The creation of the structured survey and its administration is well-explained. However, as I was reading its description – especially the part about open-ended questions – it felt more like what the authors used were semi-structured telephone interviews.
We want to confirm that this was a structured questionnaire administered by telephone, with no deviation from the questions listed in the survey. It is possible that the use of terms like 'transcribe' might make readers infer that this was in fact a semi-structured interview, and so we changed the wording to simply say:
"We audio-recorded the telephone conversation to ensure accuracy of data collection and entered numeric and narrative data into our study database, ..."
[Page 7]

13. Descriptive Analysis
The first sentence feels a bit redundant and might benefit from editing. As well, I would have benefitted from knowing what "counts and percentages" meant. As a qual researcher, I personally would have liked to know a lot more about the three readers' position to the created texts (i.e., the interview transcripts) as that will affect what is noticed in those texts and influence the discussion in which consensus was reached.
We have chosen to leave the more detailed summary of our use of descriptive statistics. We have also added an explicit statement relating to our own subject positions and reflexivity as follows:
"Our analysis was reflexively mindful of our own subject positions in the research context; we remained cognizant of the forces (e.g., our own genders, professional roles, and social positions) that affected our analysis of the data. In particular, three co-authors (B.W., K.B., W.L.) hold national leadership positions in Choosing Wisely Canada, and one student co-author is enrolled in a physician leadership stream in our medical school."
[Page 8]

14. Results
The response rate seems good for capturing and understanding the experience of the participants as a whole. I like the breakdown between year of training – especially if this will be used to explore overlaps and divergences in experience and elaborate upon why this might be – but I'm not quite sure why the gender demographic matters (unless this is a study that will use gender as a point of analysis or discussion later on). The deans' response rate seems reasonable.
The editor has asked us to provide more detail from a participant characteristic perspective and summarize these in a table. These are provided simply to give readers a sense of who provided the responses to our questionnaire.

15. Curricular Change

I think this section could be a bit more tight; this is a results section, so I think it is fine to simply report them without too much elaboration. The first sentence seems vague. It is only in the second that there is data reported that seemingly says something similar but better substantiated.

We removed the first sentence.

16. Awareness Building Initiatives

This section seemed to focus primarily upon the results and described a number of initiatives students participated in or led. I looked to Table 2 to see the breakdown more; what was confusing about that is the labeling used. Awareness Building Activities had a heading the same as some of the subcategories it seemed to include in the paragraph. This needs to be tightened up because I think it would be confusing to a reader, honestly.

We agree that this category title is confusing, and that separating out curriculum change from other activities makes this section difficult to follow. We have now removed both sub-headings, and simply include everything under the heading *"Summary of STARS Student-Led Initiatives"* – which also mirrors the wording of our overall objectives of the study.

[Page 9]

17. Medical School Deans' Perception of Impact

While I like supporting quotes, I found this section difficult to interpret because there was no mention of how the e-mail responses to the deans were analyzed. It is mentioned that all deans who responded were aware of the initiative, but does awareness = support, for example? The quotes chosen are supportive, but without any description of the methods used to analyze these – unless these e-mails are included in narrative responses – then the reader will have a difficult time to know whether or not the authors chose quotes that supported their claim versus a more comprehensive analysis of this data in which the audience can feel like the quotes were emblematic/illustrative of the themes rather than simply chosen.

Please see response to Editor comment #4 which addresses this concern (which we share).

18. STARS Program Elements

The organization of this section into three broad categories seems reasonable, although they might do well to be more explicitly labeled or set-up with labels that juxtapose many of these as facilitators (since the authors' following section is Barriers). I think that the quotes in the table are mostly supportive of the categories and this is more in keeping with what I would expect from a thematic analysis. The student perceptions column is really text-heavy for a table, I think, especially because I imagine it might be in smaller font in a publication/website format. I wonder if the authors might revise that section so it is more succinct or consider incorporating it into the body of the text.

Thank you for this suggestion. We have now renamed this sub-section "Facilitators of STARS Student-Led Initiatives" and modified the language throughout this section to emphasize that the results in this section focus primarily on facilitators.

[Page 10 & 11]

With respect to the student perceptions column, we wanted to find a way to present these richer findings but worried about word count in the actual text of the manuscript.

We did try to be mindful of the amount of text that we included, but feel that the results presented are important and provide the reader with the level of detail that might be useful if others wanted to replicate such a model. One option would be to break up the text using bullet points, and we have done this to see if this helps to address the concern regarding the density of the text in this table.

19. Barriers to Change

I think Table 4 is a good example of what Table 3 should probably look more like. This I found the easiest to read and I thought the illustrative quotes supported the theme. I think the authors might do well to lead off the paragraph by explicitly noting the three categories of barriers they identified; that might make their results easier to follow.

We have re-framed the barriers section as suggested, and added the following opening sentence:

"Students identified barriers to implementing STARS initiatives at their medical schools (Table 4), which we grouped into three broad categories: 1) students limited as change agents; 2) curricular change is complex; and 3) structural barriers."

[Pages 11 & 12]

20. Interpretation

I think some of the data presented supports the first sentence, but the claim seems a bit bold to me, in part because it seemed like in only one area – needs assessment to determine baseline student knowledge – did initiatives approach 50%. I might be getting a bit thrown here because the percentages don't break down which schools were involved (for example, are the 23% who raised awareness with a campaign week and the 23% who created an interest group one and the same?)

We agree that the we overstated our interpretation of results. We have modified the opening statement as follows:

"Within a relatively short time frame, STARS students implemented a wide-range of awareness-building activities and initiated plans to integrate, and in several cases added resource stewardship content into the curriculum."

[Page 13]

21. I don't disagree that it was useful to draw on student advocacy and leadership at all – on the contrary, as there is so much enthusiasm and ability in those joining the profession and it's a pleasure and privilege to see this in action! But I'd suggest being mindful of language that makes something seem like it caused universal change versus the data in the paper that suggests there are some early promising things going on in a few faculties.

Our original wording was that student leadership "can accelerate change" and "served as a catalyst" – neither of which we believe claim to have caused universal change. We hope that the earlier changes that addressed Reviewer #1 comment #20 helped to address this comment as well.

22. I think the recognition of "bottom-up" initiatives facilitated by "top-down" support is useful to read about and I was glad the authors strove to unpack this to some degree. I would note that the Interpretation leaves out any discussion of the Barriers to Change section, which seems to leave this section feeling incomplete. Further, "community of practice" is again brought up a few times, so it would have been really useful earlier on to know which definition the authors were using.

We have again removed any reference to the community of practice and instead substituted the term STARS student network instead.

In terms of the barriers to change, while we did not specifically call this out, much of our section labelled "Informing the Evolution of STARS" includes explicit descriptions of how we modified the second version of the

	<p>STARS campaign to address key barriers. For example, we stated that “We also updated the Leadership Summit to include content on curriculum change because past STARS students identified challenges navigating this process” to address the “Curriculum Change is Complex” theme. We also described how we more proactively identified faculty mentors, since this was identified as a limitation by some of the students. [Pages 14 & 15]</p> <p>23. Informing the Evolution... It looks like the authors attempted to incorporate their experience into the next summit and focused primarily on medical students' trajectory through training. In that vein, the initiatives seem useful and reflect back on a few identified themes in Barriers. I would be curious to know – having identified a few other barriers in their analysis – what was done to address these (or if they were, why commentary wasn't included). That would further strengthen this section. As mentioned earlier, and as Reviewer #1 acknowledges, we did attempt to describe how our modifications to the STARS campaign linked back to the results of our evaluation. Some of the barriers related to local structural challenges were not within our purview to try and address.</p> <p>24. Limitations Overall, this seems reasonable. However, there is no mention of limitations by methods used. We addressed the concern regarding methodological limitations as per the Editor's suggestion in comment #8.</p> <p>25. Conclusion At this point, in the way the data has been presented, I have a hard time agreeing with the first sentence (the comments about widespread and majority because I just don't see that in the data right now). In all fairness, that might be because of the way the data was presented (see the above comment about whether or not 23% for one activity was the same for 23% of another). So, if that claim is to be made, then the data presentation needs to support it. I would have wanted to know more about who might be included in “broad applicability” and “others” in the second sentence. I would have also liked some stronger links or perhaps more description for the next steps. We agree that the statement is not supported by our results. We have modified the first sentence to read as follows: <i>“By combining bottom-up student-led change with top-down support from local faculty and the national CWC campaign, STARS led to the implementation of a wide-range of awareness building activities and early curricular change at medical schools across Canada.”</i> We also think that “broad applicability” might be an overstatement, and so we removed this as well. [Page 15 & 16]</p> <p>26. Overall My sense is that this paper is describing a potentially useful initiative, one that addresses an area identified as nationally and internationally important and has looked to draw on student involvement. I appreciate and support the spirit of both of those, so from a topic area, I think this paper could be a useful contribution to what seems to be a growing conversation. Thank you for all of the very helpful suggestions.</p> <p>27. At the same time, I think the paper probably needs a significant re-write. The framing and methods are really important in qualitative research (or any research, of course!) and I was struck that I was left feeling confused on multiple occasions with both of these. The interpretation of the results seemed promising but incomplete, and I was not convinced the conclusions made fit the data presented. With all of that said, I would lean between either Major Revision or Reject with an invitation to resubmit if the critiques laid out above would be addressed. We have made major revisions to address many of the comments provided.</p>
Reviewer 2	Dr. Ming-Ka Chan
Institution	Department of Pediatrics and Child Health, University of Manitoba, Winnipeg, Man.
General comments (author response in bold)	<p>1. Excellent area of interest to all physicians and other health care providers. Great medical education initiative and great start to ongoing program evaluation. Like the use of data for just in time changes to future summits - action research. There are a few areas that require clarification to facilitate others who may want to do similar work. There were also some minor typos etc. I have sent the manuscript draft with my comments to the editor as the comments lists my name and I am not sure of the policy with this journal. Please contact the editor for more info. Thank you and all the best in this important work. Thank you.</p> <p>2. Missing period between sentence Added a period.</p> <p>3. Seems odd to me to call CWC a campaign rather than an organization whose mandate is to campaign for the promotion of resource stewardship. I make this statement given the last sentence of this paragraph where CWC establishes medical education as a key priority - how does a campaign establish priority? Also later you call it a CWC campaign CWC, while it has an organizational structure, has traditionally viewed itself as a campaign, and STARS is one of its sub-campaigns (as such, it's really a campaign of campaigns). More information can be found on the CWC website (www.choosingwiselycanada.org).</p> <p>4. Curricula? Also missing ' after medical schools'. We changed to “curricula” and added the apostrophe. [Page 4]</p> <p>5. 'This approach led....' - I think adding approach will help give clarity. This sentence has been removed by edits that addressed a different reviewer comment.</p> <p>6. I thought all numbers under 10 were supposed to be spelled out but will let editors sort out. We will defer to journal style as well.</p> <p>7. This peer pairing? I thought 'this' or 'that' wasn't supposed to be left hanging. What about the benefit of the second year - more experience, more diverse reach within curriculum/student body?</p>

The 'this' or 'that' was strange because this was a sentence fragment, that we have now edited.
You are right that including second year students have the added advantage of these students having more experience and potentially more reach within the student body, and so we have added this to the manuscript as follows:
"Second year students also have more experience, and may have more reach within the student body."
[Page 19]

8. Who supported them and how were they selected? Necessary to say why having them was important i.e. were they involved to help maintain engagement within the national student organizations.
The CFMS and FMEQ chose their student representative. To make this more clear, we have modified the sentence "The CFMS and FMEQ identified a student to represent each organization and participate in the summit."
[Page 19]

9. Improve the STARS initiative? Similar comment for next sentence
We agree and have modified this in response to a prior comment.

10. Take out word local for word count unless there were some regional initiatives or work done outside of medical schools
There were regional activities that we did not specifically capture, and so we will leave the term local in the paper.

11. At CWC? If so, best to specify. Individual discussion with research team or group discussion?
Yes these were 3 past CWC summer students, and so we have specified this now.
[Page 7]

12. I think we need to specify that they were not involved with STARS per se.
 We made this more explicit by modifying the sentence as follows:
"Two authors (DC and FC) administered the survey by telephone. In order to minimize bias, the two authors that collected the data were not involved in the organization of STARS."
[Page 7]

13. Answered together on same call or individually at the same time? Not clear.
The students answered together on the same call. We made this more clear by editing as follows:
"When possible, students from the same school answered the survey together on the same call..."
[Page 7]

14. Were the Dean's anonymized by school as well or were comments from deans and students linked? If both anonymized then suggest taking out work student in this sentence.
No dean responses were not anonymized because we wanted to link to student responses.

15. Did they answer as a narrative survey or just within their email?
They only answered an e-mail. We made this more clear by describing how we collected data from the deans:
"We anticipated that an in-depth questionnaire would result in a low response rate given how busy the deans are, and so elected to send them the following question by e-mail and asked them to provide a detailed response: "What impact have the STARS students had with respect to resource stewardship at your medical school?"
[Page 8]

16. Not sure why program is used as adjective here... perhaps take out word?
We changed this to simply say "facilitators and barriers." This is also more consistent with the new framing of study objectives.

17. Isn't travel a logistical reason?
Yes is redundant and so we removed.

18. Was this at time of survey or when they attended or were these the CFMS/FMEQ reps?
The student who was marked as being in third year was in second year during the Leadership Summit (November 2015) but was in third year during the time of the survey (July 2016). We have revised the table though to reflect the students' year of graduation.

19. Were the goals open or were curriculum change and awareness building initiatives the 2 goals? If the latter perhaps a sentence to reflect that at the end of this opening paragraph
The goals were open, so we did not make any changes.

20. The summit instead of 'this'.
We made this change.

21. Was not perceived as a critical enabler of success
 We expanded on this to describe why students did not perceive the Facebook to be a critical enabler of success as follows:
"For example, the Facebook group, while widely accessed by students, was seen as a nice venue to share stories and provide updates, but was not frequently used by students to seek advice from one another."
[Page 11]

22. Would be good to give example of what this hierarchical nature is.
We included in table 4 an illustrative quotation that provides a specific example.

23. Seems odd to be introducing new content to committees - perhaps just say introduction of new content was not seen as a priority.
We removed the word committees.

24. 'This' is hanging again.
We clarified to say that 'this' is referring to the STARS network.

25. See previous comment about 'this'.

We clarified to make explicit that 'this' refers to the sustainability of the STARS campaign.

26. Not sure I understand use of 'reported to' here...reported at? or just 'changes to the medical school curr...

This is a typo – we removed the word "reported".

27. Extra space

Removed the extra space.