

Peer Review File

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Reviewer A

- Important topic, clearly described
- setup is short and clearly described

Comment 1: page 3: include reference 4 to reference 3

Reply 1: We have corrected the citation formatting of the references as you indicated.

Changes in the text: page 5, line 6: ...the medically not-recommended treatment (3,4).

Comment 2: nudge and its impact on medicine needs to be explained more extensively in the introduction

Reply 2: Thank you for your advice. We added a description of previous studies using nudges with specific examples.

Changes in the text: page 5, line 21 – page 6, line 4:

For example, the study that conducted a randomized controlled trial in an end-of-life care decision-making situation reported that 77% of those given a form with a check mark for comfort-oriented care chose comfort-oriented care, while only 43% of those given a form with a check mark for life-extending care chose it, indicating the effectiveness of setting a default option (15). Another study reported that sending messages emphasizing cost could reduce the rate of missed hospital appointments (16). Thus, it has been noted that changing the way the message is presented may change the patient's behavior.

Comment 3: how were the participants selected? Not clearly depicted how they were informed about the trial? Email?Website?Print?

Reply 3: The explanation of the purpose of the study and ethical considerations was provided on the website, as we had stated in our initial draft. The survey was also conducted on the website, and we have added a note to this point.

Changes in the text: page 7, line2-8: The purpose of the research and ethical considerations was explained, and through the survey website, the patients were requested to participate in the research. Responses to the questionnaire were voluntary, and confidentiality was maintained throughout the investigations and analyses. No identification numbers were corrected. The questionnaire was administered via website and consent was considered to have been obtained upon submission of the response.

Reviewer B

I Introduction

According to the authors, the primary purpose of their research is to, "...clarify how

patients' decisions differ when a physician changes the frame of an explanation when he/she provides information about cancer treatment". The running title is -'How does the frame of communication affect cancer patients' decisions?(- From a behavioral economics point of view-).

I agree that effective health communication between physician and patient should be given considerable attention in the future. Presently, there is a 'lower perceived need to seek medical care' by many patients. This can be due, in large part, to a lack of operative communication between doctors and patients.

I concur with the concern that "...a cautious approach should be applied in the discussion of the effect of nudges". Further, I agree with the decision "...we are planning to perform experimental surveys using videos".

Since an effective video/graphic can be worth many words, what is needed is a simple, straight-forward one page, clear and objective picture of health benefits and risks associated with different kinds of medical intervention. This decision-aid should be applicable and able to address a variety of types and forms of suggested events.

A visual aid depicting recognizable or accustomed situations could be very effective in achieving this purpose. Information could be framed in a manner that enables people to relate health statistics and risk analyses to accustomed experiences.

It would be critical that information contained in any decision-aid not be biased in the direction of risk aversion or risk acceptance.

Reply: Thank you for your advice on our future development. We have not developed the video yet, but will keep visibility and neutrality in mind, as you have advised us to do!

II Path Forward

In order for this communication tool to be successful, it should include a visual display that enables the reader to look at an image and be able to readily determine risks and benefits from screening tests (e.g., colonoscopy, PSA test, mammogram, cholesterol), drugs (e.g., statins, Warfarin), and procedures for a number of health endpoints. The selected image should be able to demonstrate at a glance that a 1 in 10 risk is very different from a 1 in 1,000 risk.

Most of us are familiar with the crowd in a typical theater as a graphic illustration of a population grouping. It occurred to me that a theater seating chart could be used to objectively characterize and communicate health benefits and risks.

I call the decision-aid a Benefit/Risk Characterization Theater (BRCT). The use of my decision-aid (presented in a number of published Springer books and articles) can significantly improve accurate communication between physician and patient of health risks & benefits. Therefore, I would support their future initiatives.

III BRCT ©

Apparently, in the next step, there will be planning to ‘perform experimental surveys using videos’. I believe that to be an excellent idea.

BRCTs can be successfully used to assist patients in determining: their level of acceptable risk; if the benefits of intervention outweigh the risks; who should make the final decision regarding medical intervention; and, whether or not the decision is evidence-based. With a seating capacity of 1,000, the BRCT can make shared decision making a straight forward and positive experience for doctor and patient.

Consideration should be given to unique graphics (or videos) providing standardization which both lay people and the medical community could share when discussing courses of action. Given that we are in an era when patients are compulsively surfing the internet—it would also make sense for medical articles to include a uniform graphic to express the meaning of their findings to a lay audience and the media.

Reply II& III: Thank you for introducing us to BRCT, the decision support tool you have developed. We have read the literature and watched the videos. I found the tool intuitive and easy to understand the numbers and percentages we deal with in medicine. On the other hand, the topic we are covering is a more complex setting, with a lack of medical evidence and multiple gains and losses in conflicting situations. Therefore, we believe that simply presenting the numbers in a different way may not be effective.

We have added to this point so that it can be mentioned more clearly in the discussion. Changes in the text: page 14, line 19 –line 22

Most of the previous studies examining the effects of nudges have focused on behaviors with relatively simple gains and losses (16,17), but the choice of anticancer treatment at the end of life, for which there is little medical evidence, may have resulted in very complex and uncertain gains and losses. In addition, none of the information used in our scenario (e.g., the “stay at home” as a benefit of not receiving treatment) can be expressed numerically. These characteristics of the situation may have prevented the nudges from being effective.

Effective use of decision-aids requires an acknowledgment by physicians that the benefits from screening tests and other medical intervention remain controversial. Open and objective statements about such uncertainty are essential if we are to find a ‘path forward’.

Further, it is hoped that a clear and objective decision aid will encourage patients to fully participate in decision-making and physicians to willingly discuss risks and benefits of tests and other procedures.

Patients need to be comfortable with the format of a decision-aid. Information needs to be presented in terms and in a setting that is familiar to patients - the presentation needs to “feel” right.

This format should show patients, as simply and effortlessly as possible, what an act, procedure, or drug means in terms of their own health objectives and their quality of life. The standard approach of flashing traditional pie charts or line graphs, which demand considerable statistical sophistication to fully understand, is not going to resonate with most patients - or physicians for that matter.

Decision-aids should be designed to generate a conversation between doctor and patient. In spite of the controversy and absence of certainty associated with medical intervention, these aids should enable physicians and patients to take the first step towards reaching "common ground." Since most patients are not physicians or scientists, equations, calculations, percentages or technical text would add to their confusion.

Reply: Thank you for your comment. We agree on the importance of allowing discussion between the physician and the patient during decision support. We thought it would be an important perspective for our future research to determine in what ways it is beneficial for physicians and patients to reach "common ground" when communicating highly uncertain information.

IV Absolute vs Relative Risk

There are a number of criteria a decision-aid must meet to improve the shared decision-making process. A key, if not 'the key', criterion is to insure that health risks and benefits are presented to patients as absolute risks (as is the case in the BRCTs) and never as relative risks.

This is a critically important issue and a brief presentation here is warranted. Absolute risks and benefits reflect the number of people who will get a disease, compared to the total number of people being considered. Absolute benefits and risks are the difference between two groups. BRCTs enable patients to have a solid and tangible starting point, to discuss acceptable risks and benefits in the context of their own value systems. I would strongly consider using absolute risk when using 'videos' and 'graphics' in the future.

While one patient may perceive the single blackened seat sufficient to warrant the use of cholesterol lowering drugs, another patient may dismiss the intervention as trivial. In both cases, the patient receives identical and easily digestible information from a physician and then makes an informed decision.

Unfortunately, researchers, doctors, newspapers, radio, TV, web designers and pharmaceutical companies frequently (almost always) frame their messages using relative risks. This results in the public receiving misinformation that dramatically exaggerates and distorts health risks and benefits associated with medical intervention.

Reply: Thanks for your comments on the absolute vs. relative risk perspective. As

mentioned above, the situations we are studying are considered topics where absolute risk does not exist. Therefore, we would like to discuss in future research whether it is possible to apply the topic of decision support using nudges to such a highly uncertain situation in the first place.

V. Conclusions

1. I have appraised this manuscript and believe it should be accepted for publication. The information and analysis was very interesting and useful.
2. I concur with the authors that, “a cautious approach should be applied in the discussion of the effect of nudges”.
3. The use, in the future, of videos/graphics when ‘performing experimental surveys’ is an excellent idea.
4. Overall, the move in the future to use graphics/videos to communicate information on health risks and benefits to patients, would be very useful.
5. I believe additional work, by this group, will be very beneficial and advantageous.

Reply: Thank you for your high regard, including our prospects for the future plans. Since there were few points that could be revised in the current paper, only some of the comments are reflected in the revisions. We will consider our future plans, taking into account the treatment of absolute risk, the way the information is presented, and the "common ground" with patients based on this information.