

Positive Versus Negative Framing of Information

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Abstract

Background/Objectives: The message is being used as a mode of intervention leading to preventive health behaviors and can lead to modifications in knowledge, attitudes and behaviors in a large proportion of health behaviors. The purpose of this study is to identify the effective and persuasive message types among positive and negative message types in information on specific health behaviors, to evaluate the effects by systematically classifying and analyzing related studies and to lead evidence-based practices.

Method/Statistical Analysis: In this study, meta-analysis was conducted to evaluate the trends and reporting levels of the study in order to evaluate and systematically classify the effects of message types in information on health behavior. Only clinical studies with randomization comparing the effects of positive and negative message framing with respect to health behavior were selected. In addition, a case where the interventions were compared by dividing them into two groups was selected.

Improvements/Applications: Among the final selected papers, 7 papers were included in the included studies through methodological quality evaluation. Comparison of the positive and negative message interventions is related to health behaviors related to breast cancer (SMD -0.04 (95% CI -1.57 to 1.50), health behaviors related to vaccination (MMR, HPV)(SMD 0.20 (95% CI -0.69 to 1.08), cancer screening, vaccination, physical activity and all health activities related to Type 2 diabetes screening (SMD -0.21 (95% CI -0.89 to 0.47). All of these were not statistically significant. In order to confirm the change in health behavior according to message framing, a study considering the same target population and outcome indicators is necessary.

Keywords: Message Framing, Positive Message, Negative Message, Health Behavior.

Introduction

The message is being used as a mode of intervention leading to preventive health behaviors and can lead to modifications in knowledge, attitudes and behaviors in a large proportion of health behaviors. In order to enhance the persuasive effect of messages, various types of fields have been studied to see if there is a difference in the effect of persuading a subject depending on the type of message. Message types are categorized according to message framing, message appeal, etc. Among them,

message framing refers to a series of processes that select and make certain elements of a message stand out and recommendations provide prisoners to achieve the same purpose. It refers to the method of manipulating the messages of profit framing that highlights the potential benefits and benefits of choosing and loss framing that highlights the negative consequences of not choosing^[1].

In general, decision making of health behaviors varies greatly depending on how the problem is presented. In this case, the method of expressing the problem is called a 'frame' in judgment and judgment or selection changes as the frame changes. It is said to be a 'framing effect'. However, since there are differences in approaching framing research on health behavior, there is a need to establish evidence-based practice by checking the message framing effect through systematic consideration. In general, in the case of messages that

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motivate health-related behaviors, negative messages are perceived more effectively than positive messages^[2,3].

Indeed, in various studies, the persuasive effect of loss framing was more pronounced. In Meyerowitz & Chaiken^[4], the breast cancer self-diagnosis recommendation showed that the loss framing showed a higher self-diagnosis will. While prisoners did not adopt breast cancer self-diagnosis recommendations in profit framing because of their tendency to evade risk, loss framing strengthened their risk-seeking tendencies, making it more favorable to adopt recommendations. This is the result of prisoners handling self-discovery information that takes risks through actions that may find lesions. In the HIV recommendation study^[5]. Loss framing was highly effective among recommendations for health-promoting behaviors to detect lesions.

On the other hand, according to the Expectancy-Consistency Hypothesis proposed by Smith & Petty^[6], in the condition that the audience expects negative information, positive messages have more attention and have more influence on attitude formation.

As discussed above, there are differences in the effects of positive and negative message types in information on specific health behaviors and there is a need to identify effective and persuasive message types. This is to lead evidence-based practice by systematically classifying and evaluating research related to message framing.

Method

Criteria for considering studies for this review

Types of studies: Randomized controlled trials(RCT), controlled before and after studies

Types of participants: The subjects were not limited and all students, patients and the general public were included.

Types of interventions: We looked at studies comparing the effects of positive and negative messages in information to lead the same health behavior. Exclusion factors were excluded when the two framings could not be compared with counseling and single intervention therapy, not the type of message.

Types of outcome measures: There were no restrictions such as changes in actual behavior, behavioral intentions and attitudes and perceptions.

Search method for identification of studies:

Electronic searches: As for the data search, the search engines of Ovid MEDLINE(1966 to 2018), EMBASE(1980 to 2018), CINAL(1982 to 2018), PsyINFO(1887 to 2018) and Cochrane Central Register of Controlled trials(Issue 4, 2018) were used for overseas data search and KAMJE, Koreamed, KISS and related journals were used for domestic data search. We also looked at the list of references related to the subject in this document.

Searching other resources: Among the searched papers, a method of retrieving relevant papers among the papers that met the selection criteria and the references of the selected research was used.

Data collection and analysis:

Selection of studies: In this study, published randomized controlled trials with a high level of evidence and minimal bias were selected as the target literature for systematic review and meta-analysis. As a result variable, there was no restriction and papers that were compared by mediating positive and negative messages on the same health behavior were selected.

In order to evaluate the suitability of the selection criteria among the collected documents, the title and abstract were primarily reviewed. After extracting the data, the research method, participants, intervention, evaluation results and research results were selected and data related to the subject were selected.

Data extraction and management: Documents that did not compare the effects of message framing in the same health behavior or that did not provide the mean value, standard deviation and sample number of efficacy evaluations necessary for meta-analysis were excluded.

Assessment of risk of bias in included studies: In order to prevent the risk of prejudice, blind extraction was performed prior to comparison between evaluators with the help of one doctor and there was no part of disagreement or disagreement during the comparison. Methodological quality assessment method Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach was used and the data selected for the analysis were selected based on the following method.

- Randomization.

- Allocation concealment
- Objectivity and directness of outcomes:

Assessment of heterogeneity: The I^2 test was used to confirm the heterogeneity of the compared paper and the degree of heterogeneity is as follows.

- $< 25\%$: low
- $25\% \sim 75\%$: moderate
- $75\% <$: high

Data synthesis: Each paper has random effects models and SMD was used.

- < 0.40 represents a small effect size
- 0.40 to 0.70 represents a moderate effect size
- > 0.70 represents a large effect size

Data Analysis: I^2 test is used to check the heterogeneity of the paper and each paper is analyzed using random effects models and SMD.

Result and Discussion

Description of studies

Results of the search: A total of 233 papers were searched through the search engine and among them, 40 related papers were selected by checking the title and outline. For the selected papers, 16 papers were selected after reading the full text. Looking at the classified aspects of the selected papers through quality evaluation of the papers, 2 breast cancer screenings, 1 colon cancer screening, 1 diabetes screening and vaccination There are 2, 1 physical activity, 7 in total. The selected paper was a study conducted in the United States and the United Kingdom and the number of subjects was usually 100 to 300 and the results of the study reported the attitudes, perceptions and behavioral intentions of health behavior.

Included studies: All 7 papers were conducted on health consumers and the response rate was high in Part 2 ($> 50\%$) and low in Part 1 ($\leq 50\%$). Response rates

were not reported in the three studies. Seven papers were compared in three ways according to the health behaviors associated with the message type.

- Comparison of all 7 health behaviors
- Comparison of 3 cancer screening health behaviors
- Comparison of two vaccination health behaviors

As a result of the study, papers using standardized mean difference (SMD) were selected and papers used as odds ratio were not included.

Excluded studies: Nine papers were excluded and the reasons are as follows. SMD to compare the effect of the results was not used ($n = 6$) and the total subjects were shown, but the number of subjects according to positive and negative message types was not compared to compare the two interventions.

Risk of bias in included studies: Of the 7 papers, randomized 2 (30%), 1 randomized (15%) and 4 (55%) unclear, randomized and objective in all 7 papers Result indicators were used.

Effects of interventions

[Positive versus negative framing]

Comparison 1. Allhealth behaviors: The changes in awareness, attitudes and intentions according to message framing were examined for all health behaviors (physical activity, cancer screening, vaccination, diabetes screening). The combined estimates were statistically insignificant with SMD -0.22 (95% CI -0.89 to 0.47) and among the combined papers, Bigman (2010) and Nicholson (2008) were qualitatively superior papers, respectively, with SMD 0.64 (95 % CI 0.33 to 0.96) and SMD 0.38 (95% CI 0.15 to 0.61) showed that the negative message type was statistically significant in leading health behavior changes than the positive message type. The heterogeneity of the study combined with ($I^2 = 98\%$) was found to be very severe. Figures 1 and 2 show forest plots and funnel plots for all health behaviors.

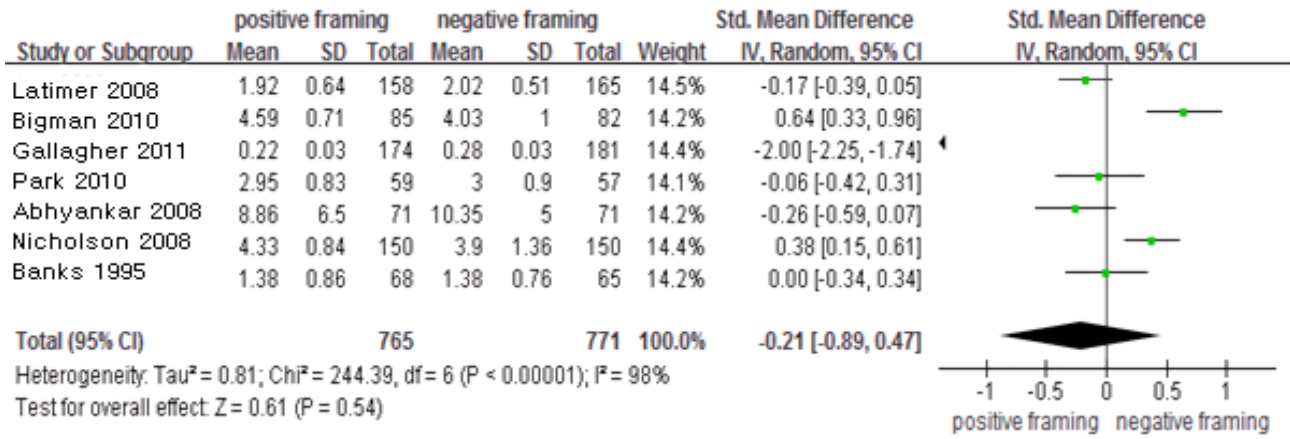


Figure 1. Forest plot of comparison 1: Allhealth behaviors

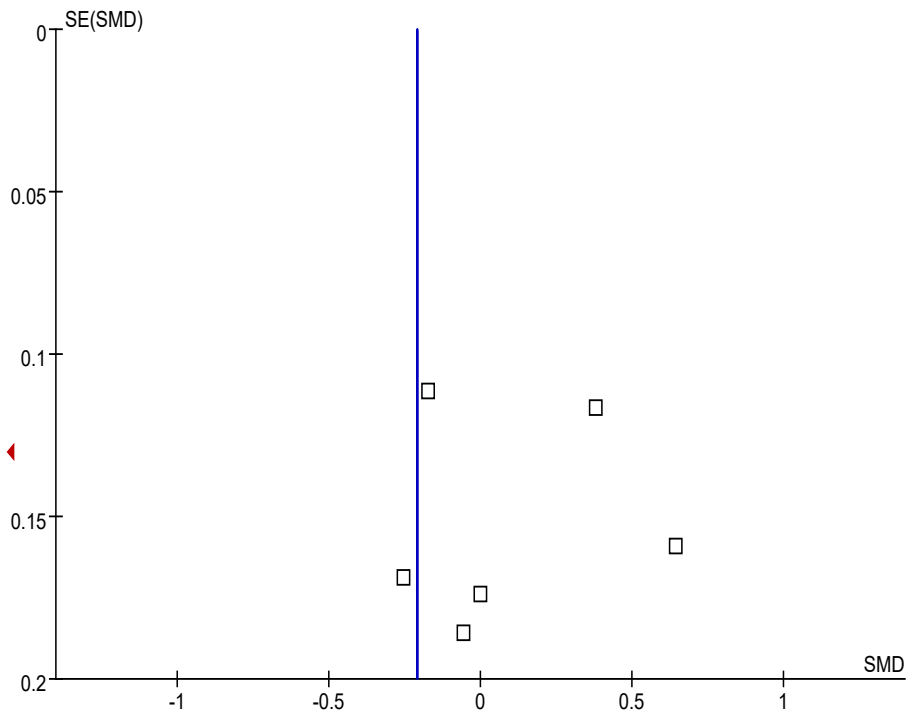


Figure 2. Funnel plot of comparison 1: Allhealth behaviors

Comparison 2. Cancer screening: Among the seven selected papers, we examined changes in perception and intention according to message framing in relation to cancer screening behavior. Combined estimates were statistically insignificant with SMD -.044 (95% CI -1.57 to 1.50) and among the combined papers, Gallagher et al. [8] was positive with SMD -1.26 (95% CI -1.49 to 12.04). The message showed statistically significant perceived sensitivity to examination rather than negative message. On the contrary, Nicholson (2008) showed that SMD 1.15 (95% CI 0.91 to 1.39) showed that the

negative message type showed a statistically significant change in cancer screening intention rather than the positive message type. The heterogeneity of the study combined with (I² = 99%) was found to be very severe. Figures 3 and 4 show forest plots and funnel plots for cancer screening.

Comparison 3. Vaccination: Among the seven selected papers, changes in perception and intention according to message framing were examined in relation to vaccination (MMR, cervical cancer vaccine) behavior.

The combined estimates were statistically insignificant with SMD 0.20 (95% CI -0.69-1.08) and among the combined papers, Bigman et al.^[7] was a qualitatively superior paper with SMD 0.64 (95% CI 0.33 to 0.96). Negative message type was statistically more significant

in vaccination perception change than positive message type. The heterogeneity of the study combined with ($I^2 = 93\%$) was found to be very severe. Figures 5 and 6 show forest plots and funnel plots for vaccination.

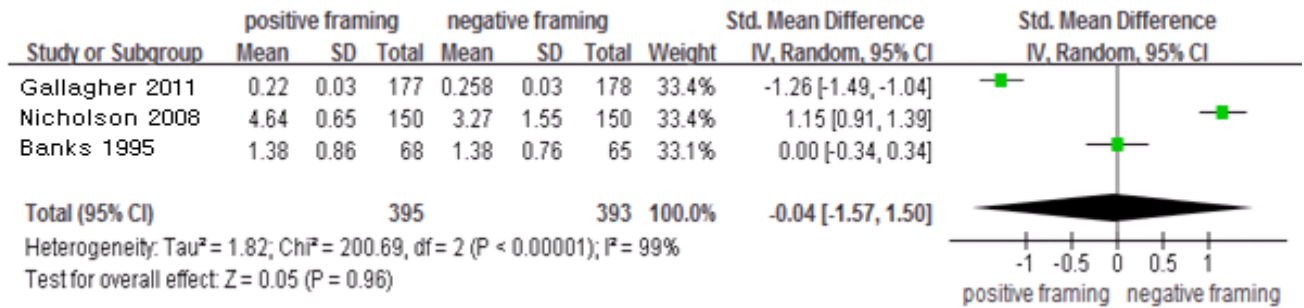


Figure 3. Forest plot of comparison 2: Cancer screening

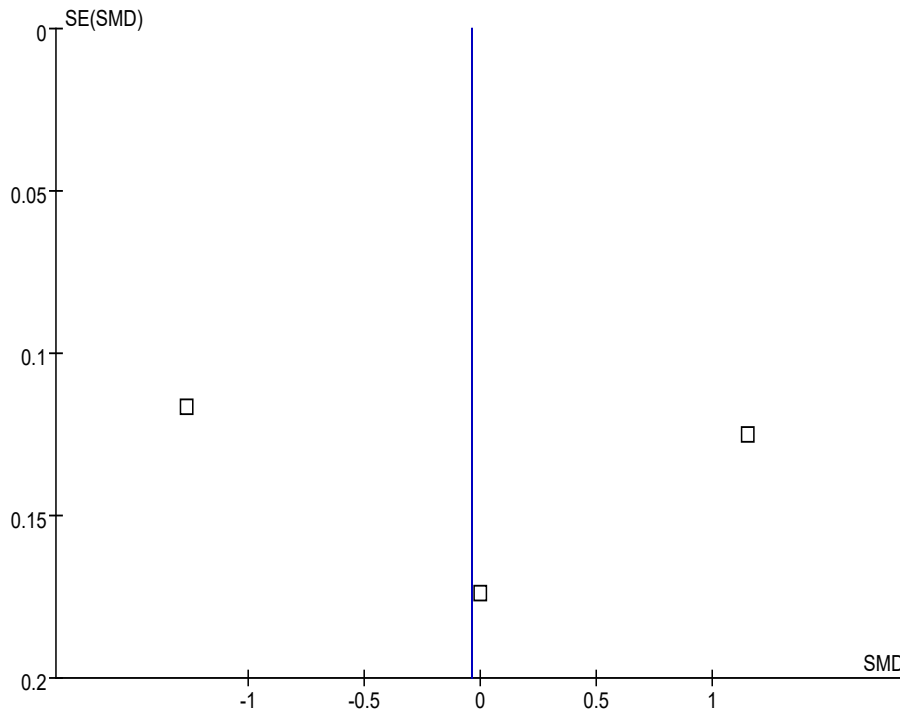


Figure 4. Funnel plot of comparison 2: Cancer screening

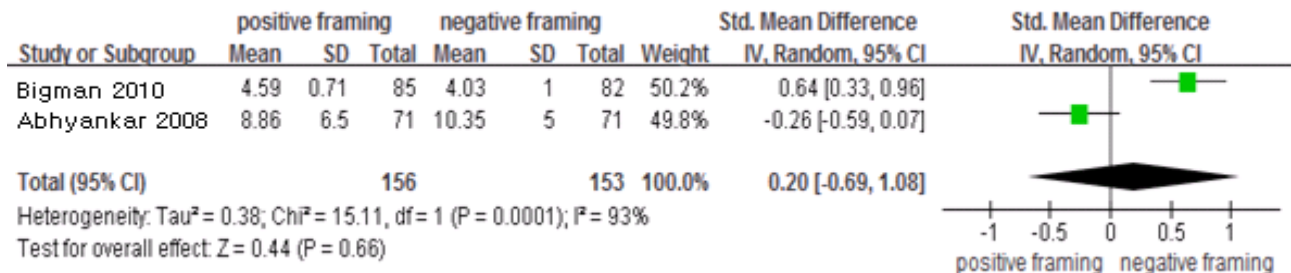


Figure 5. Forest plot of comparison 3: Vaccination

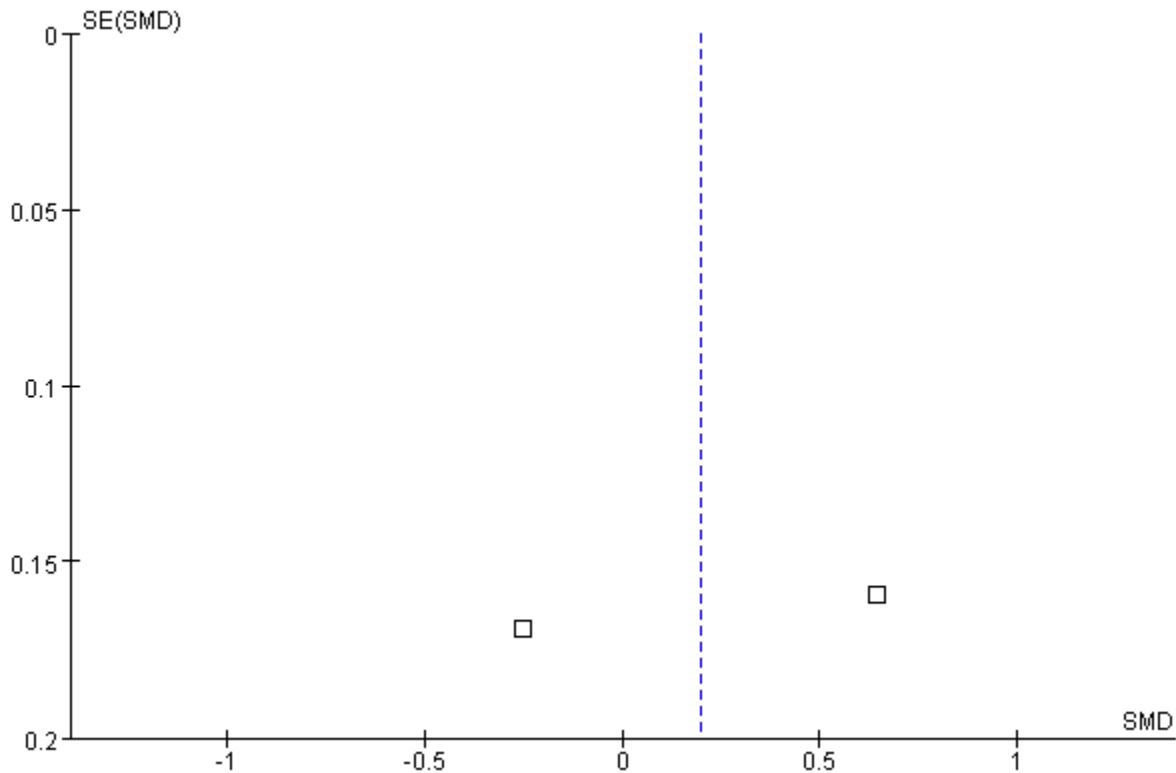


Figure 6. Funnel plot of comparison 3: Vaccination

Discussion

In order to prepare evidence-based practice, we looked into effective message framing in the decision process of health behavior. However, through the selected paper, the difference between the positive message and the negative message effect was not statistically significant. This does not take into account different population and outcome measurement method, variable definitions, tracking periods and estimates. It is confirmed that the quality of the data is low because it was induced. Nevertheless, among the combined papers, it was possible to identify the types of messages that statistically significantly influenced health behavior. In Bigman et al. [7], a negative message type was found to be more effective than a positive message type in the perceived benefit associated with uterine cancer vaccination of college students and the change in adult colon cancer screening intentions in Nicholson et al. [8]. In addition, in the perceived sensitivity associated with breast cancer screening in adult women, positive messages were found to be more effective than negative message types.

Of the 7 selected papers, only 2 (30%) of studies with cover-ups were assigned and 1 (15%) with no cover-ups, but 4 studies (55%) appeared to be unclear. As the allocation concealment was not clearly seen in more than 50% of the papers, it would have been a risk factor for bias in analyzing and synthesizing data.

The quality of the selected papers was evaluated based on the GRADE approach and randomized and objective result indicators were used for all 7 papers. The combined paper evaluated the estimated values with SMD and CI and the I2 test was used as an important evaluation index to give the meaning of SMD. The papers used for combining were highly heterogeneous and there was no difference between positive and negative messages in the estimated values.

All of the studies selected in this paper were excluded from the selection because the domestic papers did not select randomization and concealment of sampling.

Although studies with theoretical backgrounds such as message framing are being conducted both domestically and abroad, differences between domestic

and foreign studies have been found. In Korea, studies have been active in the field of health and crisis behavior, which focuses on eating habits, smoking, exercise, skin health, drugs and decision making. In foreign studies, various disease areas such as cancer prevention and screening, influenza and glaucoma and physical activity was working on framing.

The estimates from the selected papers were not statistically significant. Three studies in the sub-region showed statistically significant differences according to message framing. Each is as follows.

In the Gallagher et al.^[9] study, the positive message type was more effective than the negative message type in breast cancer screening intentions for adult women, which is contrary to those of Block & Punam^[2] and Meyerowitz & Chaiken^[4] showed.

In the study of Nicholson et al.^[8], in the intention to screen for colon cancer in adults, the negative message type was statistically significant in leading to changes in health behaviors rather than the positive message type and the Bigman et al.^[7] study targeted female university students. In the intention to inoculate the cervical cancer vaccine, the negative message type was statistically significant in leading the change in health behavior than the positive message type.

The limitation in this study is that the previous studies have not been sufficiently progressed, so there is a problem that it cannot be analyzed in consideration of the same population and the same outcome variables, so it is not possible to accurately predict the prediction of the framing effect in the prevention and examination of diseases. In addition, even in the same framing type, differences may occur depending on the type of educational materials (document, audiovisual, etc.) and the method of education (persuasive, explanatory, etc.) and depending on the individual characteristics of the recipient, in addition to the message involvement and recommendation characteristics Framing effects can vary, so it is necessary to measure individual perception and characteristics.

In addition, this study has difficulty in developing discussions because it did not look at the similarities or differences with research trends in other fields that can be compared while conducting research on the framing of health-related messages.

Conclusion

The effect of message framing on the macroscopic part that affects population health as well as on health risk behaviors and disease-related choices should be studied. If we can grasp the effect of message framing on health behavior through these studies, we will be able to prepare an effective and useful theoretical framework for constructing the message of the health campaign, which will contribute to establishing evidence-based practice. .

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