**Health Content Exposure, Reappraisal, and Health Anxiety**

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**Introduction**

Social media has become a powerful force in information sharing as it has the ability to reach vast audiences. According to Fox and Duggan (2013), about 59% of U.S. adults search for health information online in the United States, and about 77% online health searchers used Google, Bing, or Yahoo. However, it often amplifies rare health stories that can be misleading (Darwish et al., 2023). For instance, a headline about a 20-year-old having cancer—an occurrence as rare as a plane crash—may capture individuals’ attention and health anxiety by making exceptional cases common. According to Steven Taylor (2004, p. 118), the media contributes to hypochondriasis, a severe form of health anxiety. Sensational reports, such as botched surgeries, draw attention, increase biases, and increase the likelihood of believing that medical tests and doctors are unreliable. Also, a study by Muse et al. (2012) investigated the relationship between health anxiety and searching for health information online. In total, 187 participants were recruited to complete the Short Health Anxiety Inventory. They revealed that there is a significant relationship between health anxiety and frequency associated with searching health related information online.

The cognitive behavior model proposed by Warwick and Salkovskis (1990) explains that individuals with health anxiety often have distorted beliefs about health and illness, which causes them to misinterpret bodily sensations as signs that they are ill or at a risk of becoming ill. Based on this model, searching for illness related information online can contribute to health anxiety(Muse et al., 2012; Singh & Brown, 2014), such as providing contradictory information that adds to their uncertainty.

While a bit of concern over health is considered normal, health anxiety usually occurs when there is an “inappropriate or excessive fears and worries focused upon a perceived threat to one’s own health” (Bailer et al., 2015). From a dimensional perspective, health anxiety can be placed in a continuum ranging from mild to severe. Mild health anxiety can be beneficial as it encourages one to seek medical care when necessary, while excessive health anxiety, which causes worry and preoccupation, it can lead to distress, difficulties in relationship and work, and overuse of medical health services (Asmundson et al., 2010). Some important clinical expressions of health anxiety include hypochondriasis. In the *DSM-IV-TR*, hypochondriasis is defined categorically, meaning that it has clear criteria that individuals must fully meet to be diagnosed, rather than being viewed dimensionally. It is described as severe health anxiety that is characterized by a persistent fear of having serious illness due to misinterpretation of bodily sensations, and it lasts despite medical evaluation and reassurance (Bailer et al., 2015). Due to its categorical definition, hypochondriasis has been criticized that it excludes those with milder forms of health anxiety who may still experience distress. Many have proposed to replace hypochondriasis by the term health anxiety that includes not only the severe but also the milder forms of health anxiety (Bailer et al., 2015; Asmundson et al., 2010). In *DSM-V*, hypochondriasis is reclassified into Illness Anxiety Disorder and Somatic Symptom Disorder. Health anxiety mainly falls under Illness Anxiety Disorder, which emphasized fear of illness in individuals with little to no physical symptoms while Somatic Symptom Disorder applies to those with severe physical symptoms (Newby et al., 2017; Tyrer, 2018). No matter how the categorization is, it is clear that health anxiety, especially severe forms, can have negative impact on individual’s well-being, relationships, and decisions about seeking healthcare. Not only is it harmful to individuals, but it also creates more burdens on healthcare systems as individuals utilize resources and request medical tests unnecessarily. This highlights the importance of understanding health anxiety and contributing factors, such as social media.

This study utilizes Gross’s (1998) Process Model of Emotion Regulation, which provides an important framework for understanding how individuals manage emotions at different stages of the emotional process. It distinguishes five emotional regulatory processes: situation selection, situation modification, attention deployment, cognitive change, and response modification. It is mentioned that cognitive reappraisal, a form of cognitive change which focuses on changing how we see a situation before emotion fully develop, serves as a useful strategy for managing emotions (Gross, 1998). According to a vast amount of studies, cognitive reappraisal is thought to be a useful response-focused strategy for alleviating one’s negative emotion. For example, Gross and John (2003) explores the impact of different emotion strategies on one’s emotional well-being. They specifically delve into suppression and cognitive reappraisal. The participants of Gross and John’s study (2003) were drawn from undergraduate samples and were asked to complete a survey using Emotion Regulation Questionnaire(ERQ), which was designed to measure their use of two emotion regulation strategies: cognitive reappraisal and expressive suppression. The study showed that participants who used reappraisal experienced greater positive emotions and less negative emotions expressions. McRae, Jacobs, Ray, John, & Gross, 2012 also suggested that reappraisal has been linked to positive affective outcomes by gathering data from online bulletin boards postings and paper fliers and using laboratory assessment and Emotion Regulation Questionnaire. The studies and the framework provides important insights into managing health anxiety. Browsing health-related content often lead to fear and anxiety, but according to these studies, cognitive reappraisal can help alleviate its negative effect and encourage people to see the information in a less overwhelming way.

However, a study by Brockman, Ciarrochi, Parker, and Kashdan (2016) shows that the effect of cognitive reappraisal is not consistent with previous research and is not always effective. They investigated the use of three different emotion regulation strategies in daily life and collected data from 187 college students through online surveys and used measures such as Emotion Regulation Questionnaire. What they discovered was that for some participants, cognitive reappraisal is not related to decreased negative effect in daily life. Surprisingly, Their study even found out that it was related to increased negative effects. This finding raises questions about the circumstances in which reappraisal is effective and highlights the need to understand whether reappraisal is effective in managing negative emotions like health anxiety caused by frequent exposure to health-related content on social media.

While previous studies have delved into different emotion regulation strategies, most of them have limited their samples to undergraduates only. Few have applied them to contexts like social media and health anxiety. Given the conflicting findings of the effect of reappraisal, my current study tries to address the gap and wishes to investigate whether exposure to health-related content online is associated with health anxiety and to examine if cognitive reappraisal moderates the impact of this exposure on negative emotional outcomes, specifically health anxiety. The hypothesis is that frequent exposure to health-related content will lead to increased health anxiety, but individuals who frequently use cognitive reappraisal are expected to experience lower levels of anxiety compared to those with lower reappraisal abilities. The study helps examine the effectiveness of cognitive reappraisal in the context of health anxiety, which is essential as it becomes more common with the rise of social media. To replicate previous research, my study includes the Emotion Regulation Questionnaire (ERQ) and the Short Health Anxiety Inventory (SHAI) in the online survey.

**Method**

**Participants**

A total of 111 Participants were recruited via Prolific for a study on “Emotions in Daily Life.” Eligible participants were those 18 years of age or older, who listed their nationality and current residence as the United States, and were fluent in English. The sample was mostly female (52.3%), with males comprising 45.9% of the participants. Ages ranged from 22 to 62 years (M = 36.80, SD = 9.55). The majority of participants identified as Latinx (36.9%), followed by those identifying as White (35.1%). In terms of sexual orientation, 69.4% identified as heterosexual only, while 29.7% identified as part of a sexual minority. Each participant completed a battery of measures assessing emotion-relevant individual differences and outcomes, including daily experiences of emotions, emotion-related skills and traits, and indicators of health and well-being. The variables of interest that are reported here were excerpted from this larger dataset.

**Measures and Variables**

Reappraisal skills were measured using six items from the Emotion Regulation Questionnaire(see Appendix C), including items such as “When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.” Responses were measured on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). Responses were averaged to create a single composite variable, *reappraise\_mean*, with higher scores indicating greater reappraisal ability (Cronbach’s α = .91).

The Short Health Anxiety Inventory (see Appendix B) was used to assess individuals' health anxiety, with questions such as “Please indicate how often the following statements apply to you: I worry about my health” and “When I hear about an illness, I think I have it myself.” Responses were measured on a 5-point scale from almost never (0) to almost always (4). Responses were averaged to create a single composite variable, *shai\_mean*, with higher scores indicating greater health anxiety (Cronbach’s α = .87).

Exposure to health-related content was calculated as the product of the number of days and the minutes spent per day on health-related content.

**Research Ethics**

This study was approved by the University of Richmond Institutional Review Board (IRB). All participants provided informed consent before completing the study (see Appendix A for the full consent form).

**Results**

**Table 1**

*Descriptive Statistics and Correlations for Health Anxiety, Reappraisal Skills, and Exposure to Health-Related Content*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Anxiety | Reappraisal | Exposure |
| Anxiety | **1.07 (0.87)** |  |  |
| Reappraisal | -.007 | **5.00 (1.13)** |  |
| Exposure | -.062 | -.020 | **66.05(183.40)** |

*Note.* Means and standard deviations (in parentheses) appear in bold along the diagonal. Correlations between variables appear below the diagonal. \*\*\* *p* < .0001, \*\* *p* < .01, \* *p* < .05, † *p* < .10

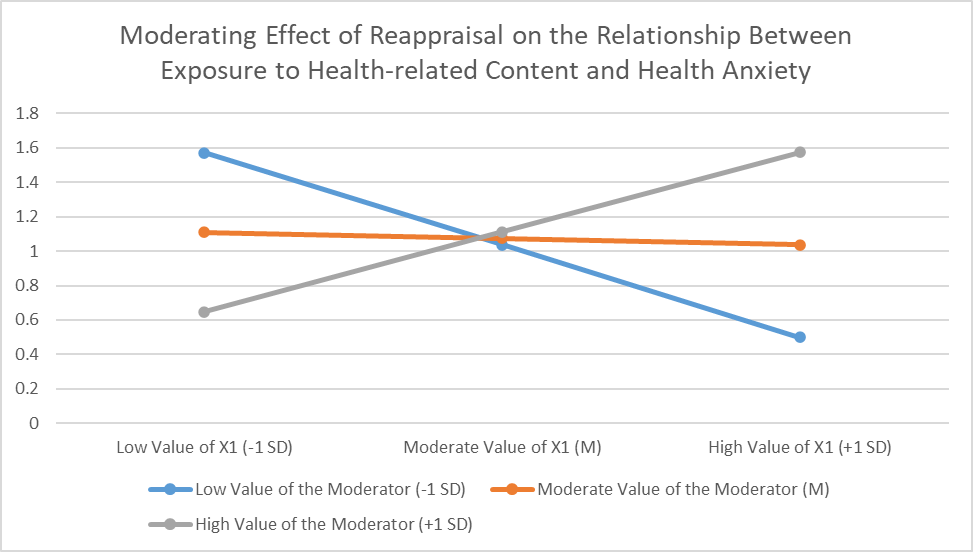
To examine the relationship between the variables, Pearson correlation analyses were conducted in SPSS. As shown in *Table 1*, participants reported their exposure to health-related content for a mean of 66.05 (SD = 183.40). They had an average reappraisal score of 5.00 (SD = 1.13). Their average reported health anxiety score is 1.07 (SD = 0.87). Correlations between the variables were small and non-significant. Exposure to health-related content negatively correlated with both reappraisal (r=-.02) and health anxiety (r=-.06). Reappraisal skills and health anxiety were barely correlated(r=-.007).

To explore how exposure to health-related content and reappraisal skills might work together to influence health anxiety, I conducted a moderation analysis using the PROCESS macro in SPSS (Hayes, 2023). Exposure and reappraisal were mean-centered, and thus a score of zero represented the sample average.

The relationship can be observed in *Figure 1*. The analysis indicated a significant interaction between exposure and reappraisal. In other words, it means that reappraisal skill is associated with the way exposure to health content affects health anxiety (b = 0.0024, *SE* = 0.0008, *p* =0.0059). In this case, for those with lower reappraisal skills, higher exposure to health-related content was associated with lower health anxiety (b = -0.0029, *SE* = 0.0010, *p* = 0.0057); whereas, for those with higher reappraisal skills, greater exposure was associated with higher health anxiety (b = 0.0025, *SE* = 0.0011, *p* = .0236). It is interesting to note that neither exposure (b = -0.0002, *SE* = 0.0004, *p* =0.6392) nor reappraisal (b = 0.0333, *SE* = 0.0725, *p* = 0.6467) alone had a significant association with health anxiety. Only the combination of these factors worked.

**Figure 1**

*Interaction Effect of Reappraisal on the Relationship Between Exposure to Health-Related Content and Health Anxiety*



*Figure 1.* Slopes depicting the moderating effect of reappraisal on the relationship between exposure to health-related content (IV) and Health Anxiety (DV).

**Discussion**

My hypothesis predicted frequent exposure to health-related content to be linked with higher health anxiety, and their relationship can be influenced by cognitive reappraisal, the moderator. The results are not fully supported by my hypothesis. There is no direct relationship, as exposure to health-related content did not significantly predict health anxiety, nor did cognitive reappraisal alone. However, while there is a significant interaction between exposure and cognitive reappraisal, it is different from what is expected. According to the findings, when there is high reappraisal, frequent exposure to health-related content was linked to greater health anxiety, while at low levels of reappraisal, frequent exposure was linked to reduced health anxiety. In this case, the results suggest that while cognitive reappraisal is generally considered an effective response-focused strategy for regulating emotion, it in fact amplifies health anxiety when individuals are frequently exposed to health-related content.

The result finding seems to align with what Brockman, Ciarrochi, Parker, and Kashdan (2016) has discovered in their study. They found that cognitive reappraisal is related to increased negative effect in half of their participants. Moreover, the study by Brans et al. (2013) also suggests that reappraisal was not significantly associated with a reduction in negative affect in individuals. It is possible that participants are other strategies like rumination at the same time , which causes them to repeatedly focus on the fearful consequences of bodily change. This could interfere with the effectiveness of reappraisal (Elhamiasl, Dehghani, Heidari, & Khatibi, 2020).

This study contributes to our understanding of emotion regulation strategies and helps to get a more comprehensive look into one’s emotions. It suggests that cognitive reappraisal should not always be viewed as an effective strategy to improve one’s well-being; rather, its effectiveness depends on the situation (Aldao & Nolen-Hoeksema, 2012). One limitation of the study is that it relies on self-reported responses, which are not considered objective. Furthermore, the questions in the inventory may not fully capture one’s emotional experience. For example, items like “When I want to feel more positive emotion, I change what I am thinking about” may not reflect the concept of reappraisal well (Brockman, Ciarrochi, Parker, and Kashdan, 2016). The sample diversity is also limited, with most participants being White and Latinx.

The finding can be applied in clinical settings and mental health interventions. The result suggests that for individuals who regularly look for health-related content online and are highly anxious, reappraisal may not always be a helpful strategy, and without careful consideration of the situation, the use of this strategy may be associated with greater health anxiety. Also, content creators and healthcare providers should consider the way health information is presented online to avoid creating greater health anxiety in highly anxious individuals.

It is important for future studies to continue to look at individual differences and investigate if personality traits like neuroticism and openness plays a role and affect the relationship. For example, individuals high in neuroticism may be more anxious when exposed to health-related information online. Researchers could also explore the role of other strategies such as rumination and its interaction with reappraisal when one encounters health related content. For instance, does using rumination reduce the effectiveness of reappraisal? Moreover, studies should continue to understand the effectiveness of reappraisal in different context such as different types of health-related content.

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**Appendix A**

**Informed Consent**

**Consent Form**   
 You are being asked to take part in a research study examining people's daily emotional experiences and how those are related to a variety of health, well-being, social, and other outcomes. Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. If you have questions, please feel free to contact the researchers (listed below) for more information.  
   
 **Purpose**  
 The purpose of this study is to examine people's daily emotional experiences and how those are related to a variety of health, well-being, social, and other outcomes. The study should take approximately 60 minutes to complete. If you agree to participate, you will be asked to complete an online survey with measures that inquire about your emotional experiences, as well as questions about your relationships, your health and well-being, your childhood experiences, and basic demographic information (for example, age, gender identity, and racial-ethnic identity). You will also be asked to answer questions in response to photographs, imagined scenarios, and videos.  
   
 **Contact Information**  
 This research is being conducted by Principal Investigator Kristjen Lundberg and students enrolled in an undergraduate course on emotions at the University of Richmond. If you have questions or would like to talk with the Principal Investigator (i.e., the researcher in charge of this study), you may contact Dr. Lundberg at klundber@richmond.edu.  
   
 **Possible Risks**  
 The risks associated with this study are minimal. That is, the risks for completing this study are no more than the risks experienced in daily life. However, some of the questions will ask you to recall or to imagine experiences where you may (have) experience(d) negative emotions, including potentially traumatic experiences that occurred in childhood, such as physical, sexual, and emotional abuse, while other materials reference violence and death. **Given the topics of this study, you may find it uncomfortable or upsetting to reflect on some of them.**  
   
 You can avoid the possibility of such experiences by not participating in this study. If you do experience any discomfort during the study, remember you can stop at any time without any penalty. You may also choose not to answer particular questions that are asked in the study. If any of the experiences in the survey leave you feeling psychologically unwell, we encourage you to contact your healthcare provider or to seek out other mental health resources. There may be uncommon or previously unknown risks. You should report any problems to the Principal Investigator at klundber@richmond.edu.  
   
 **Possible Benefits**  
 There are no direct benefits to you for participating in this project, but you may experience some satisfaction from contributing to this investigation. You will also receive $12.00 for your participation. Please note that those who withdraw from the study early (return their submission via Prolific), complete the study exceptionally quickly (a response time more than three standard deviations below the average), or provide two or more text entries or narrative answers that indicate low-quality, nonsensical responding will not receive payment for their participation.  
   
 **Confidentiality of Records**  
 Reasonable steps will be taken to ensure that your individual results will remain confidential. However, as with any research process, the risk of a breach of confidentiality is always possible. Nevertheless, to the best of the investigators' abilities, your answers in this study will remain anonymous and confidential. Once the study is completed, we will completely "deidentify" our data. All identifiers will be removed from any identifiable private information and only then will the information be used for future research studies.  
   
 **Use of Information and Data Collected**  
 We will not tell anyone the answers you give us. Your responses will not be associated with you by name and the data you provide will be kept secure. What we find from this study may be presented at meetings or published in papers, but your name will not ever be used in these presentations or papers.  
   
 **Protections and Rights**  
 If you have any questions concerning your rights as a research participant, you may contact the Chair of the University of Richmond's Institutional Review Board (IRB) for the Protection of Human Subjects of Research at (804) 484-1565 or irb@richmond.edu for information or assistance.  
   
**Statement of Consent**  
 The study has been described to me and I understand that my participation is voluntary and that I may discontinue my participation at any time without penalty. I understand that my responses will be treated confidentially and used only as described in this consent form. I understand that if I have any questions, I can pose them to the researcher. I have read and understand the above information and I consent to participate in this study by clicking "Continue." Additionally, I certify that I am 21 years of age or older.

* "Yes, I agree; I wish to begin the study." (1)
* "No, I do not agree; I do not wish to participate." (0)

We appreciate the time that you are taking to complete this survey. It because of individuals like you that we are able to conduct research.  
   
 This survey will ask you to complete multiple sections that include questions about your emotional experiences, your relationships, your health and well-being, and other topics. It was designed by students enrolled in an undergraduate course on emotions at the University of Richmond.   
 It will take **approximately 60 minutes to complete**. If you do not have the time to complete this survey, please close the browser now.

**Appendix B**

**Short Health Anxiety Inventory (SHAI)**

The following items are used in the study to assess participant’s health anxiety levels.

Please indicate how often the following statements apply to you using the scale provided.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Almost Never (0-10%) (0) | Sometimes (11-35%) (1) | About half the time (36-65%) (2) | Most of the time (66-90%) (3) | Almost always (91-100%) (4) |
| I worry about my health. (shai\_1) |  |  |  |  |  |
| My family and friends say I worry about my health. (shai\_2) |  |  |  |  |  |
| I am afraid of having a serious illness. (shai\_3) |  |  |  |  |  |
| I have images (mental pictures) of myself being ill. (shai\_4) |  |  |  |  |  |
| I have difficulty taking my mind off thoughts about my health. (shai\_5) |  |  |  |  |  |
| When I hear about an illness, I think I have it myself. (shai\_6) |  |  |  |  |  |

**Appendix C**

**Emotion Regulation Questionnaire (Reappraisal Only)**

The following items are used to access participants’ reappraisal skills.

In this section, we would like to ask you some questions in particular about how you control (that is, regulate and manage) your emotions. The statements that follow focus on your emotional experience, or what you feel like inside. Although some of the following questions may seem similar to one another, they differ in important ways.

reappraise1 When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)

reappraise2 When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)

reappraise3 When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)

reappraise4 When I want to feel more positive emotion, I change the way I'm thinking about the situation.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)

reappraise5 I control my emotions by changing the way I think about the situation I'm in.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)

reappraise6 When I want to feel less negative emotion, I change the way I'm thinking about the situation.

* Strongly disagree (1)
* Disagree (2)
* Somewhat disagree (3)
* Neither disagree nor agree (4)
* Somewhat agree (5)
* Agree (6)
* Strongly agree (7)