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Leveraging Health Behavior and Communication Theories to Support Adolescent and Young Adults: Conceptualizing Social Media Wellness in Relation to Disordered Eating

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Keywords

eating disorders, health belief model, social media, media literacy, young adults, adolescents

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Abstract

Social media platforms like Instagram serve as an important mechanism for transmitting social information and influence. However, the nature and use of these platforms are known to perpetuate eating disorders (EDs) or further disorder eating symptoms. This concept paper proposes merging health behavior and communication theory to create a comprehensive and applicable framework for remediating pro-eating disorder social media content among people who have eating disorders. To this end, the Social Media Wellness Model, which is adapted from the Health Belief Model, the Uses and Gratifications approach, the MAIN model of media affordances, and media literacy training, is proposed. This paper shows how theoretical model components can be mapped back to behaviors typified by individuals with EDs, or those predisposed to developing EDs. Subsequently, we propose a training intervention to highlight salient literacy cues, and outline next steps for testing and developing this model with the ongoing support of a community advisory board (CAB). Creating a CAB with individuals who have lived experience of an ED or disordered eating, and who use social media, will be vital to testing the applicability of this conceptual Social Media Wellness Model for ED recovery.

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Introduction

Eating Disorders: Prevalence and Background

Despite increased awareness and advances in treatment, the prevalence of eating disorders (EDs) continues to rise (Galmiche et al., 2019). The lifetime prevalence (using weighted means) is 8.4% for women and 2.2% for men, although there are larger variances of ranges within those prevalence estimates (Galmiche et al., 2019). EDs are recognized by the DSM-V as "a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food, and that significantly impairs physical health or psychosocial functioning" (Dell'Osso, et al. 2016, p.1651; see also APA, 2013). Though different EDs can be distinguished by distinct sets of behavior, most hold potential for significant morbidity and mortality.

Descriptions of various EDs can be found in texts dating back to the Middle Ages when extreme self-starvation, or *Anorexia mirabilis*, was accepted as an aspect of spiritual purity or holiness (Bynum, 1988; Dell'Osso et al., 2016; Espi Forcen, 2013). It was not until the mid and later 19th century that food refusal began to be viewed as a psychological issue, and ultimately associated with a compulsive drive for thinness (Dell'Osso et al., 2016). More contemporary psychology has shown personality factors, such as negative emotionality and perfectionism, to contribute to the development of EDs (Wade et al., 2016). However, changing social factors, including identity and role transition during

emerging adulthood (Potterton et al., 2020), social pressures to become thin, and even family communication about dieting play a significant role in the development of EDs, particularly among younger adults (Claydon et al., 2020; Fredrickson & Roberts, 1997). Within this changing psychosocial milieu, social media has also emerged as a significant factor in the development and maintenance of EDs.

Social Media Use and Eating Disorders

Social media channels serve as an important mechanism for transmitting social information and influence (Anderson & Jiang, 2018; Haridakis & Hanson, 2009; O'Keeffe & Clarke-Pearson, 2011; Susarla et al., 2012). Up to 88% of Americans age 18-29 use social media, particularly the *Facebook*, *Snapchat*, and *Instagram* platforms, and most visit these platforms one to several times a day (Anderson & Jiang, 2018). The ability to self-select the peer environment on social media may increase susceptibility to internalizing societal expectations of beauty or body shape/weight norms. Visual attributes of social media afford users instant and constant exposure to desirable images. When individuals see peers that they value who are objectified or self-objectifying, they may internalize these cues and begin to self-objectify as well (Frederickson & Roberts, 1997). This internalization can result in both psychological and physical consequences including, but not limited to, body dissatisfaction, disordered eating, and body dysmorphia. Accordingly, higher *Instagram* use (measured by average minutes per week) among young adults has been associated with a higher prevalence of orthorexia nervosa, an ED which focuses obsessively on 'clean or healthy' eating and is often comorbid with anorexia nervosa (AN) (Turner & Lefevre, 2017). Additionally, young adults who follow strangers on *Instagram* are more likely to engage in social comparisons, a process known to exacerbate body dissatisfaction and trigger EDs (Lup et al., 2015). Similarly, Mabe et al. (2014) found in a large sample (n = 1960) of women that greater self-reported *Facebook* use was associated with more disordered eating primarily through the perpetuation and social media reinforcement of the thin ideal. It appears that social media reliably delivers a steady stream of idealistic but unrealistic images paired with frequent reinforcement by other users. As a result, there is increasing evidence that exposure to online content depicting risk behavior is associated with the enactment of risk behavior in everyday life, such as increasingly restrictive eating or a hyper-focus on body aesthetics (Branley & Covey, 2017a; Fung et al., 2019).

Pro-Eating Disorder Messaging

The proliferation of pro-ED messaging[1] messaging on social media platforms is a particularly disturbing trend. These are social media images and posts that focus intently on emaciated body parts (e.g., sharp shoulder blades, thigh gaps), normalize ED behavior (e.g., vomiting or use of teas/supplements that act as emetics or laxatives), and otherwise express similarity and solidarity with others who are actively, and often secretly, sustaining their ED. These users often organize into loosely tied groups that offer social inclusion and resistance to the status quo, sometimes termed an "echo chamber" because of the selective homogeneity of ideas (Fung et al., 2019, p. 5). Pro-ED user groups may perpetuate myths

[1] There are several terms used to reference social media messages intended to facilitate disordered eating (e.g., Pro-ana, Pro-mia). Because there are several types of disordered eating, we use the general term: "pro-ED" to refer to the wide range of messages intended to promote or perpetuate disordered eating.

and misinformation resulting in a potentially dangerous barrier to new initiates or recovering persons. Alternatively, pro-ED messaging exists in the same content universe, and is sometimes dwarfed by ED *recovery* messaging, which offers support and inspiration to those working to break free of the disorder (Branley & Covey, 2017b). At its worst, ED-related misinformation may launch impressionable individuals into action skipping valuable steps in the behavior change process such as contemplation and preparation or, more dangerously, reinforce risky and potentially life-threatening behaviors.

Hilton (2018) documented potential ED-related misinformation associated with a sample of messaging from pro-ana or pro-ED websites and online communities. These included: 1) EDs are mental illnesses and websites do not cause mental illness, 2) pro-ana websites and EDs are about more than wanting to be thin, 3) EDs develop regardless of pro-ana websites, 4) pro-ana sites do not cause EDs but they may trigger or encourage them (sub-theme: the problem is the user, not the site), and 5) pro-ana sites provide support. These themes help to create a false illusion of normalcy and acceptability for pro-ED messaging on these platforms.

These and other studies are building an evidence base for the influential role of social media in the creation and maintenance of EDs (e.g., Branley & Covey, 2017b; Fardouly & Vartanian, 2015; Park et al., 2017). Though there are methodological challenges associated with this line of work (See Fung et al., 2019 for a useful list), health-related social media messaging studies are frequently devoid of a mechanism linking social media exposure to behavioral effects. The link between content exposure and behavioral outcomes has been the focus of media effects researchers since at least the 1940s (Vorderer et al., 2019). Though there is no one model of media effects, there are multiple theories and frameworks that assume different perspectives of users, contexts, or process (Rubin, 2009).

To address the challenge of pro-ED messaging on social media, we propose an integrated theoretical framework informed by the Health Belief Model (HBM, Rosenstock, 1966), Media Uses and Effects theory (Katz et al., 1974; Rubin, 2009), and media literacy training (Bergsma, 2011), to create an approach for intervention with disordered eating populations. This two-phase model embeds social media use within a predictive health promotion process. The first phase depicts health beliefs and motivated social media use, and the second, remediation phase integrates core health behavior constructs into a media literacy intervention aimed at facilitating critical social media use. Our aim is to develop a user-centric social media literacy skill development tool to support therapeutic approaches to ED treatment. This paper documents our theoretical framework and the key constructs providing the foundation of this work.

Theory for Application of the (ED) Health Belief Model

The Health Belief Model (Rosenstock, 1966) is one of the oldest and most recognized health behavior theories and we chose it for inclusion into our theoretical framework owing to its ability to predict and explain behavior across a wide range of behaviors, including healthy eating behavior. Notably, early applications of HBM were adapted to bulimia prevention (Grodner, 1991). More recent research has shown the ability of HBM to predict intention to lose weight in a sample of middle school girls (Park, 2011), while other research incorporated HBM into web-based persuasive communication interventions designed to address and promote healthy

eating behavior in young adults (Orji et al. 2012; Peng, 2009). Recently, HBM components informed a content analysis of Instagram posts about Zika virus risk, revealing a disproportionate balance of threat and self-efficacy messaging (Guidry et al., 2019). We chose to incorporate HBM theory because of its record of utility in successfully developing and evaluating social media-based health related messages.

According to HBM, an individual's perceived risk susceptibility and threat severity for a given health outcome, taken with their perceptions of potential benefits if actions are taken to avoid that outcome, influences their readiness to take action, and change their risk-related behavior (Rosenstock, 1974). HBM constructs are included in both phases of our Social Media Wellness Model (see Figure 1). Personalizing the risks and seriousness of disordered eating to users of pro-ED social media platforms is critical to influencing readiness to change. However, our Social Media Wellness Model proposes these constructs take on secondary importance in the temporal sequence in this persuasive communication context, and cues to action take on initial primary importance in the first phase of the model, termed "Instagram User Characteristics & Competencies."

Cues to action are generally defined as strategies to activate "readiness to change," promoting awareness through reminders and can be particularly useful in persuasive communications (Mattson, 1999). Hence, first providing users of pro-ED social media platforms cognitive cues to help trigger action(s) that could move these individuals into spaces that would positively reinforce new behaviors is of primary importance. In this context, cues to action first "prime" critical thinking in potential users to discern misleading pro-ED information on social media platforms.

The advantages of first cognitively priming users on social media platforms to evaluate the accuracy of information has recently been demonstrated in the field of political science (Pennycook et al., 2018; Pennycook et al., 2020). In each of these respective studies, the researchers demonstrated that although individuals are generally able to discern misinformation on digital platforms, certain aspects of social media can distract users by triggering affective responses such as outrage, fear, disgust, shock, or surprise. This disruptive response can derail accurate information and correct perceptions and interpretations, leaving these to become secondary senses. In the context of interpreting and sharing fake news (Pennycook et al., 2018), or COVID-19 misinformation (Pennycook et al., 2020), users may not consider accuracy when deciding whether to share news and proceed to share misleading content (Pennycook et al, 2020). This is akin to vaulting individuals into action without contemplating the health enhancing decision, or engaging in the requisite preparation for change. In the context of social media users visiting pro-ED sites, the implications of peripheral processing are clear for health behavior researchers and the intervention development. If health behavior researchers are able to leverage social media platforms that regulate negative influences on their sites, they could create and test brief, persuasive communications grounded in health behavior theory constructs, such as cues to action in order to influence or interrupt the behavior of focus, ED-related messaging. Consider the following example: because food restriction is the dominant characteristic of AN, dieting may continue

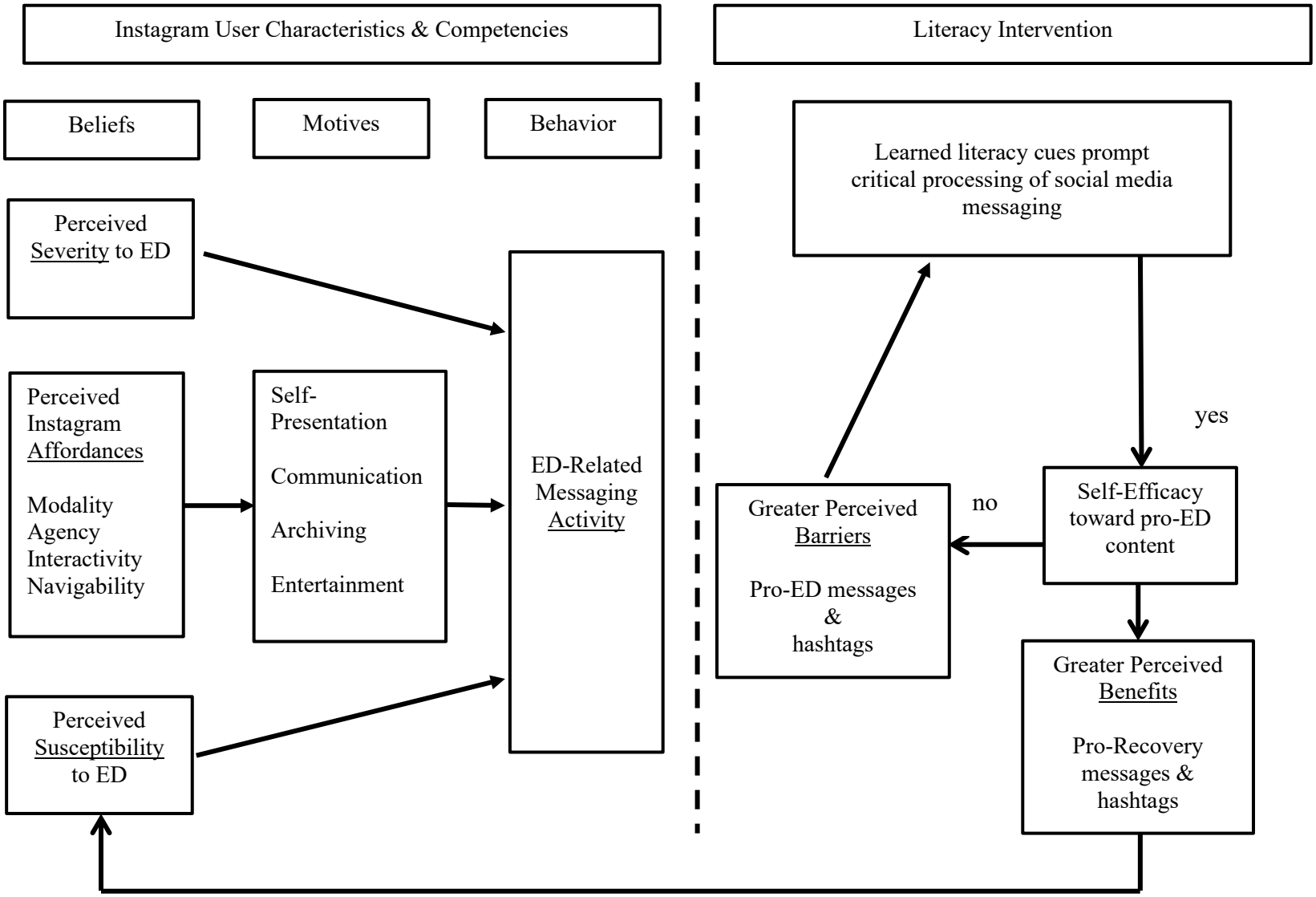

Figure 1. Social Media Wellness Model

without any contemplation of the behavior (Walsh, 2013).

A user displaying symptomology of AN who enters a pro-ana site may encounter a pop-up message that reads, "Have you noticed that your diet and weight loss are all you think about, so much that you feel bad about yourself? This is not normal. Help is available." This message would be accompanied by a hyperlink that connects to an evidence-based site that could help trigger contemplation for change for positive behaviors by providing a self survey aimed at personalization of the risks and seriousness of the disordered eating and the benefits of change. Health behavior researchers understand positively reinforced behavior is far more likely to be sustained (Skinner, 1938).

(Social) Media Uses & Effects

Media influence has concerned and captivated the public since the early days of serialized fiction and radio (Vorderer et al., 2019). Scholarly approaches adopted different paradigms of user agency ranging from media content effects prompting uniform cultural change (i.e., less user agency) to more variable effects that depended on user motives, attention, and elaboration (Rathnayake & Winter, 2017; Rubin, 1993; Ruggiero, 2000). This latter view, known as the Uses and Gratifications approach, assumes that media use is purposeful and requires agency for message-related effects to occur (Katz et al.,1974). A proliferation of research followed, revealing a fundamental dichotomy of motivated media use; that of the active information seeker and that of the less agentic, more habitual user who uses media to pass time or relax (Rubin, 2009). However, some have remarked that this approach does not correspond easily to a highly nuanced Internet and varied forms of digital messaging (Sundar & Limperos, 2013).

New models of social media user agency are emerging that better reflect those unique attributes, or affordances, of social media platforms and other Internet-based technologies. The MAIN model was advanced to account for explaining the complexities associated with users' engagement with modern digital technologies (Sundar, 2008; Sundar & Limperos, 2013). Generally, this model purports that each technology offers certain affordances, that is, capabilities native to a medium that can facilitate certain actions. Affordances can influence user expectations for a given type of social media experience, such as with a social networking platform (e.g., Instagram) or digital device (e.g., smartphone). MAIN is an acronym for the four primary affordances that appear to be common and psychologically meaningful to most digital technologies. These include: 1) Modality, or mode of presentation such as text, audio, video, photograph, etc.; 2) Agency, or the user's ability to be a source of information such as tweeting, commenting, or other message sharing activity; 3) Interactivity, or the ability to make changes to distributed content; and 4) Navigability, that is the ability to move to different spaces within the medium. In sum, the MAIN affordances describe ways in which content is encountered rather than describing the content itself. Affordances then serve as cues that provide information about the quality, usability, or acceptability of a message source.

This user-centric model of social media use posits that message influence is the product of user motivations (i.e., active/ passive) and technological (i.e., medium) affordances. User motives and perceived affordances determine variably active cognitive and affective processing, which further determines the likelihood of

behavioral change (Levy & Windahl, 1984; Rubin, 2009; Sundar & Limperos, 2013). For example, Phua et al. (2017) established that different design and interface features of various social networking sites were associated with different motives for use, and gratifications received from those sites. Similarly, experimental research within this view offers evidence that greater agency and interactivity predict cognitive involvement with content and stronger intent to manage and disseminate the content (Oh et al., 2015). This framework provides a pathway to understand how user and social media platform characteristics may facilitate pro-ED content sharing and messaging. The second phase of our model focuses on augmenting this process with ED-relevant media literacy training to promote recovery from eating disorders.

Media Literacy as a Protective Factor for ED Recovery

Media literacy refers to critical analysis of one's own media use and content. For example, a prime-time television viewer might recognize a name brand soda in a situation comedy as product placement advertising. Similarly, digital media literacy approaches aim to create information processing and technology competencies in digital media users that can be targeted to specific content, and used to mitigate unwanted effects. For example, in a field experiment, researchers implemented a reflective thinking literacy curriculum targeting adolescent tobacco use (Pinkleton et al., 2007). Reflective thinking about tobacco messages and portrayals improved understanding of persuasive techniques used by tobacco companies, changed perceptions of peer tobacco norms, and shifted expectancies for tobacco use. Social media companies have recently recognized the impact of potentially problematic ED content by blocking the use of certain pro-ED hashtags and providing disclaimers, but these practices appear to have little effect (Fardouly & Holland, 2018; Gerrard, 2018). Therefore, given the central importance of motivated message processing, and perceived digital media affordances in determining potential message outcomes we position digital media literacy as a means of addressing the internal processes that lead to and reinforce the use of Pro-ED content. Media literacy methods provide an ideal point for targeted intervention of destructive social media messaging (Fardouly & Vartanian, 2016).

Social Media Wellness Model

The main constructs within the proposed Social Media Wellness Model are adapted from the HBM, the Uses and Gratifications approach, the MAIN model, and media literacy competencies, marrying public health and communications theories to each other in one predictive process model (see Figure 1). The defined user group of this model would be those who have a diagnosed ED or a predisposition to an ED (i.e., those who are exhibiting disordered eating or other sub-clinical ED symptomatology). This intervention is intended to be delivered in a therapeutic setting, but we do not preclude its usefulness in school-based or family settings.

The first step of the model specifies the variable, *user motives* for ED-related social media. Though much social media content appears to reflect needs for self-presentation and creating a record of stories and experiences, it is important to verify user motives within this specific and concerning category of social media use. Second, user motives are moderated by ED-related beliefs, such as: *perceived susceptibility to the ED* (how much they feel the messages might trigger their current ED or perpetuate symptoms)*, perceived severity of the ED*

(how severe they perceive the messages and the threat of an ED to be), and *perceived self-efficacy* (perceived ability to resist disordered eating). Without these ED-related beliefs, there is a lower likelihood of content-driven ED-related behavior (ED-related social media posting or consumption of ED-related social messages). It is important to note that though it is less likely for ED-related behavior to occur without corresponding beliefs of susceptibility, threat, and self-efficacy, we expect a threshold where continuous exposure to pro-ED content, without intervention, may translate to ED progression. Third, as described above, motives to actively use social media to sustain ED beliefs, taken with perceived affordances of a select digital medium (e.g., Instagram), will enhance content involvement and *intentionality*. We expect distinct pathways, as described above, to predict the likelihood of using social media to sustain developing or established EDs.

The remediation phase of the Social Media Wellness Model depicts a media literacy intervention informed by the range of pro-ED content found on Instagram. Specifically, the aim of this activity is to buffer those individuals with greater perceived barriers (i.e., more pro-ED messages and hashtags) with literacy cues to action via coached social media literacy training. This highly focused training is intended to increase self-efficacy to resist pro-ED content, which in turn supports the focused behavior change (e.g, posting or consuming pro-recovery messages, or lessening time spent on pro-ED content). The remediation phase is aimed toward development of a more realistic view of individuals' own perceived susceptibility to EDs.

We do not expect this sort of targeted training to be a silver bullet in the treatment of EDs, but given the success of media literacy in other venues (Xie et al., 2019), we aim to provide a meaningful tool to address this growing front in ED-related social media messaging. There is increasing evidence that Instagram has a strong effect on health behavior, especially related to nutrition and physical activity (Pilgrim & Bohnet-Joschko, 2019; Turner & Lefevre, 2017; Xie et al., 2019). Social media networks such as Instagram can be a useful tool to help users move toward more positive behavior because their ubiquity and tailored content is amenable to media literacy training. Development of literacy-based cues to action, paired with frequent reinforcement opportunities, will provide an accessible platform for intervention.

Discussion

Future Research & Limitations

Our first and most important next step is to create and develop a diverse community advisory board (CAB) consisting of individuals who have EDs or have a predisposition for an ED (disordered eating) to help us inform and test this conceptual Social Media Wellness Model and guide the proposed media literacy intervention. The CAB members will provide their own detailed self-perceptions of ED-related beliefs, social media content, and other model components prior to development of a self-report survey for a larger population. It is our experience that people sharing a common challenge can develop an energetic synergy that transcends individual experiences. This lived experience of the ED community is a significant resource that must be approached with care, caution, and respect. We plan to develop this network with the support and input of treating clinicians and women and men recovered from EDs. Our aim is to engage the group to solicit information, ideas, and advice at every step of model development and testing.

The agenda for testing the Social Media Wellness Model features creation and piloting of measures that reflect the context of ED-related social media use. Standard measures will be carefully translated to this context and piloted within our CABs. Measures of social media use, motivation, and affordances will also be developed from validated and reliable existing measures. We recognize that this model is at a conceptual phase in development and we remain open to lessons learned by others using the HBM and other health message processing approaches. However, we are presenting a model we believe has a reasonable chance of viability based on documented arguments and evidence from the literature. It is also important to clarify that our approach is not intended to be used alone, but rather as a tool for credentialed counselors to use with their recovering patients. Thus, data gathered in future research with CABs and ED clinicians will be essential steps in testing and refining the model and its theoretical components. This iterative process may lead to new insights, including the possible inclusion or exclusion of other theories, the incorporation of individual lived experiences, and modification of proposed model pathways, before the model can be translated into practice. Finally, because social media platforms (and how individuals interact with them) continue to evolve, our model may need to be adapted accordingly based on new available information as alternative technologies are developed.

Implications

There are several implications that the proposed Social Media Wellness Model offers to the public health field and professionals, clinicians, and individuals living with an ED or in recovery from an ED. By integrating the HBM with validated mediated communication theory we hope to better understand the influence of social media use on both pro-recovery support and pro-ED message behavior. Our approach is nested within familiar territory for public health scholars. However, the prevention and intervention of EDs are often absent from the public health sphere, or not thought of as public health problems. There are efforts to change this perception (Austin, 2012; Pagoto et al., 2019), but more interdisciplinary research and interventions are needed to connect information processing to behavioral outcomes. Integrating health behavior theory with applied communication theories to drive a media literacy intervention may make ED prevention, and the prevention of other risk behavior, more amenable to large scale public health intervention.

Additionally, harnessing perceived susceptibility and severity beliefs to positive and negative cues to action grounded in social media content could help clinicians better conceptualize the ways in which their patients' EDs are perpetuated through social media. Clinicians may be able to integrate media literacy into therapeutic approaches to better assist their patients in learning to navigate these sites in a way that will support their recovery. New knowledge on how ED clients currently use social media could also help clinicians better understand the nature of perceived susceptibility to and severity of EDs and corresponding triggers prompted by social media.

Finally, there are many implications of the Social Media Wellness model for individuals with EDs as well as those predisposed to EDs (with disordered eating behaviors). There is hope that persons living with EDs, and their family and friends, can utilize this knowledge to give patients tools and strategies for managing social media in relation to their ED. We expect that creating media literacy interventions for social media will prove beneficial to all stakeholders within this community.

Conclusion

The proposed Social Media Wellness Model is created to integrate individual-level theories of health behavior change and media influence with a cognitive skills model to reduce the negative effects of pro-ED social media messaging. This conceptual theoretical framework will be implemented with the ongoing aid of a CAB whose lived experience will light the path to real-world applicability. We expect this work to illuminate some of the darker corners of the Internet and grant people living with EDs an important tool for recovery.

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