

Evaluating Consumer Informatics: Learning from Health Campaign Research

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Abstract

This paper suggests that some conceptual models used in health communication campaigns as well as the “uses and gratifications” approach might be successfully integrated into the evaluation of consumer informatics. These models and tools are especially pertinent when the desired outcomes of media health interventions are therapeutic changes in public knowledge, motivations, attitudes and patient behavior.

Keywords:

Consumer health informatics, Opinion/Future vision paper, Evaluation studies, Communication barriers.

Introduction

Eysenbach emphasizes that evaluation remains a key challenge to advance the literature in consumer health informatics [1]. Eysenbach notes a “dearth of evidence in the field,” which he suggests might be overcome by more systematic techniques, such as randomized clinical trials, to assess the effectiveness of informatics as a clinical intervention.

Recent articles by Eysenbach as well as Friedman and Haug suggest the field of health informatics is at a formative stage [2]. Besides improving methodological underpinnings and tools, Friedman and Haug suggest broader strategies to advance quantitative approaches to informatics evaluation, including borrowing from other disciplines.

This paper suggests that some conceptual models used in evaluating health communication campaigns, as well as a research tool called the “uses and gratifications” approach, might be successfully integrated into areas of consumer informatics evaluation. These models and tools are especially pertinent when the desired outcomes of a media health intervention are therapeutic changes in public knowledge, motivations, attitudes and patient behavior.

For more than 30 years, health intervention campaigns have used all forms of mass media, including commercial newspapers, magazines, radio, television and more recently the internet, to help convey health messages to the public. The motivation for health campaign researchers to work with commercial mass media (both news and entertainment divisions) stemmed from consistent survey research that mass media were the primary source of consumer health information [3]. While the role of commercial mass media is not public education, some health intervention campaigns (e.g. smoking cessation and heart disease

prevention) established successful, cooperative partnerships with for profit as well as non profit mass media [4]. Within the health campaign literature, the internet is perceived as a new mass medium to generate consumer awareness and influence public health education. While the Institute of Medicine (IOM) noted the internet has unique attributes compared to traditional media (such as an optimizing the potential for consumer interaction), the internet is perceived to advance a tradition that broadly uses mass media as a strategy to influence consumer health awareness, attitudes and decisions [5]. As such within the health communication campaign research literature, consumer informatics is primarily the study of how mass media and other interventions affect a spectrum of audiences.

In health campaign research, it is normative to measure independent variables ranging from consumer cognitions, motivations, attitudes, inclinations, socio-cultural influences as well as dependent variables ranging from consumer attitudinal changes and clinical behavioral changes, as the paper will briefly describe [6].

The evaluation of how media campaigns as interventions impact consumers parallels the research suggested by Eysenbach as well as Friedman and Haug. This is especially true in cases where therapeutic changes in public knowledge, attitudes, motivations and clinical behavior are the desired outcomes of consumer exposure to informatics based media.

The IOM recently added that health communication campaign research has developed a broader framework to evaluate how consumers “converge” on media, (or how consumers make health care decisions and comparatively assess an array of resources including mass media, health care providers, interpersonal and cultural influences) [5]. This essay introduces some of the models that health communication researchers have used as well as the IOM’s critique of current health campaign evaluation efforts (which calls for more inclusive tools to evaluate how previously identified variables interact). The paper notes the potential value of “uses and gratifications” approach as a research tool for both health campaigns (to respond to the IOM’s evaluation challenges) as well as consumer informatics evaluation. The paper notes the similarity between the Pew Internet & American Life’s depiction of consumer health internet use patterns and a “uses and gratifications” categorization [7]. Although little utilized in health communication research, a “uses and gratifications” approach may provide a useful tool for evaluation in both health campaigns and consumer informatics (especially whenever

er interventions are seen to impact public knowledge, attitudes, motivations and patient behaviors).

The uses and gratifications approach

Since the paper suggests evaluating the dynamics of consumer health informatics by a “uses and gratifications” approach, it is operationally defined in this section and its importance as an alternative to traditional health campaign research will be introduced.

The “uses and gratifications” approach divides why consumers are attracted to any mass medium into two broad motivations – regardless if it is a commercial or non-commercial publication (e.g. newspaper, magazine, pamphlet, book) broadcast (radio or television), video and film, or internet site. Consumers are seen to converge on mass media for a combination of reasons, which primarily include both a mass medium’s “uses” (or pragmatic utility) and its perceived potential for “gratifications” (or more emotional dimensions) [8,9]. Similar to cognitive psychology, a “uses and gratifications” approach, “...emphasizes the organizing activity of the subject in the relationship between the subject and the object.” [10, p. 201].

The term “uses” broadly represents mass media’s utilitarian and social learning capacities, as perceived by consumers. The term incorporates the widely accepted idea that consumers sometimes use media to provide useful information, to give advice, to help one learn and provide some insights that may be useful in any role or life situation, such as at work, or as a voter, consumer, parent, friend, child, caregiver, patient, etc.

The term “gratifications” broadly means consumers sometimes use mass media to support pre-existing beliefs, to reinforce previous decisions, to feel connected or establish empathy with persons one does not know, to find new bases for interaction and communication with others, to escape into the problems and worries of others and an array of other emotional, psychological and often deeply personal, affective needs. While mass communication researchers have often evaluated these motivations as mutually exclusive, a “uses and gratifications” approach has represented a more holistic evaluation of an individual’s motivations to attend to mass media [11]. Since the key is to interpret how media impact individuals from a consumer’s (or individual’s perspective), a “uses and gratifications” approach seems analogous to what Wiljer and Catton describe in a clinical context as a “patient-centered” model of care [12].

Two generations of health campaign research

The National Cancer Institute (NCI) divided the history of health communication campaign literature into two generations, which fostered different conceptual approaches to evaluation [13]. These will be described briefly since they have not been widely reviewed in the informatics literature and because the health communication and consumer informatics fields share mutual interests in evaluating consumer media behaviors and resulting health outcomes.

The first generation of health campaign research assessed consumer media behavior in a now somewhat-eclipsed framework that the IOM labeled as the “Input-Output” or “Health Beliefs” models of mass communication [5, p.342-43]. Briefly, the “In-

put-Output” model noted that five steps were required for health mass communication messages to be persuasive for consumers: exposure and attention to the message, comprehension of the message, yielding to the message, retaining the message and actual behavior change. The model also emphasizes evaluating message design, appropriateness of the mass medium, credibility of the message’s source and audience demographic characteristics [14]. The “Health Beliefs” model suggested consumers would be more likely to adopt the behavior(s) suggested in media messages if: (a) persons felt susceptible or threatened by the disease or condition, or (b) if they perceived the personal benefits outweighed the barriers to comply (including financial, social and personal costs) [15].

Both in terms of evaluation and adoption of desired health behaviors, Logan and Longo found the first generation of health communication research successfully demonstrated that mass media campaigns influenced awareness of the campaign among target audiences [6]. But by the early 1980s, Salmon described evaluation frameworks based on the first generation of research as conceptually one-dimensional [3]. Salmon noted the need for a new generation of health campaign evaluation to conceptually encompass how consumer cognitions, attitudes and motivations affect health care behavioral decisions in order to improve compliance.

Besides assessing cognitive, attitudinal and motivational factors, the NCI noted the second generation of health communication campaign research (which started in the 1980s and continues) integrated individual skills, cultural influences and socio-psychological variables within evaluation frameworks for the first time.

Two prominent conceptual models in the second generation of health campaign research are the “Theory of Reasoned Action” and “Social Learning (Cognitive) Theory.” The “Theory of Reasoned Action” notes that consumer behaviors and attitudes are influenced by both perceived broad social or cultural norms and more immediate interpersonal influences, such as family and peer reference groups [16]. “Social Learning Theory” divides a health mass communication process into four steps: providing information efficiently through trusted personal and media sources, a motivational component (similar to “Reasoned Action”), enhancing the development of social and self skills (by promoting self-efficacy) and creating social support that enables a person to make health care behavioral changes [17].

The IOM also notes the “Health Beliefs” model was supplemented by a “Stages-of-Change” theory that evaluates more specific consumer psychological states, which are seen to influence subsequent attitudes and behaviors [18]. New theories of social influence, social comparisons and convergence also reinforced the importance of immediate and broader peer influences (acknowledged in “social learning theory”) [19]. In addition, second generation health mass communication research included: a) new conceptual emphases on intrapersonal factors, such as the theory of emotional response -- where consumer saliency is linked to the perceived emotional content in messages, b) the impact of news content on the perceived saliency of health policy issues and c) the impact of entertainment content on consumer lifestyle-health perceptions [5, p.344, 20,21].

The second generation significantly expanded the conceptual understanding of health mass communication by adding broader sociological, psychological media and cultural influences, as well as more attention to an individual's cognitions, emotions and life skills. Applied to consumer health informatics evaluation, both the first and second generation of health campaign research provide an array of conceptual models and grounded instruments with direct applications to circumstances where the purpose of informatics intervention is to influence consumer awareness, knowledge, attitudes, predispositions, behavioral inclinations and actual clinical behaviors. Both generations of health communication campaign research provide a range of models and theories to draw exemplars for the evaluation of consumer informatics.

The IOM's critique and challenge

While the second generation of research provided a more comprehensive array of variables to anticipate and evaluate in consumer health communication campaigns, the IOM recently noted that new models had been introduced without an underlying approach to explore how they are linked. The IOM concluded the most pressing research challenge in current health communication campaign research is to return to basic research that comprehensively evaluates how interpersonal, cultural, psychological, sociological and mass media-derived factors interact and intersect [5, pp.346-48]. In terms of evaluation, the IOM implied future health communication research needed more inclusive and functional tools [5, pp.346-48]. Ideally, these tools or approaches would better describe the dynamics of how consumers derive health information, ideas, opinions, attitudes from mass media versus other sources and resources – and how these influences have an impact on actual clinical behaviors. The IOM's critique also seems to be an important consideration in the development of consumer health informatics evaluation – where two generations of mass media health interventions might be metaphorically seen as a road grid missing some intersections. If the consumer informatics field can learn from health communication research, then, this would be a significant addition to both health communication campaign and consumer informatics evaluation.

“Uses and gratifications” approaches – implications for health campaign research and informatics

Given a challenge to find a more interactive approach, it is surprising that most critics of health communication research and proponents of improving consumer informatics evaluation have not used a “uses and gratifications” approach as a conceptual tool to evaluate consumer health media interventions. A “uses and gratifications” approach seems pertinent in health communication campaign research because in contrast to most theories of mass communication and health communication, “uses and gratifications” represents an interactive, functional, consumer-based approach [22].

A uses and gratifications approach also: a) represents a tool to potentially resolve some of the challenges in health campaign research and b) recent findings about consumer health behavior on the internet reported by the Pew Internet & American Life project seem consistent with a “uses and gratifications” cate-

gorization. In a recent national survey of consumer health seeking on the internet, Pew found patients and caregivers (consumers) primarily look for information about specific diseases or conditions [7]. Pew also found consumers are motivated to: discover and participate in health related on-line groups, obtain emotional support (by seeking others patients or caregivers with the same disease and condition) and gain more sense of self-control, power and validation in making personal decisions and anticipated conferences with health care providers. To put these findings another way, Pew describes primary consumer web health behaviors are finding information (which are uses) and to communicate with others, obtain emotional support and empowerment (which are gratifications). While Pew's findings do not demonstrate the external validity of a “uses and gratifications” approach, they functionally depict consumer motivations toward health information seeking on the internet through a “uses and gratifications” categorization. This suggests, in turn, that a “uses and gratifications” approach may be applicable to evaluation settings where the focus is how informatics (as an intervention) affects consumer awareness, knowledge, attitudes, predispositions about health and eventual clinical behaviors or outcomes.

“Uses and gratifications” research has been operationalized into scales, some of which have been tested for internal consistency, stability and face and concurrent validity [23]. These scales normally measure consumer motivations and were adopted recently by the author (with others) to identify psychographic profiles of visitors to an arthritis website [9]. However, a “uses and gratifications” approach can be modified to measure health outcomes or changes in health behaviors as dependent variables. Since “uses and gratifications” is a research tool more than a theory, it also can be adapted to include sociological and psychological models derived from second generation health communication campaign research. Research topics might include: a) how individuals and audiences make sense of media (comparing cognitions, emotions and predispositions to how persons derive meaning from medical information), b) how interpretive communities or formal/informal peer groups share experience as well as forms of discourse and frameworks and c) how consumers compare the relative influences of reference group, cultural norms and media when they make health care decisions.

To accomplish this, a researcher could incorporate some existing scales to measure psychological states, sociological and cultural influences plus individual cognitions, emotions and life skills (derived from the second generation of health communication campaign research) as independent variables. These might join the more traditional “uses and gratifications” scales (to explore consumer motivations) explained above – with health outcome measures serving as dependent variables.

For example, to evaluate the “uses” of a hypothetical website designed to increase interest, knowledge, motivation and involvement among arthritis care givers, some independent variables might include the target audience's:

- Cognitions (a caregiver's knowledge about arthritis as a disease and condition).

- Interest in learning more about a caregiver's role. (The extent of knowledge and interest suggest the salience of a site devoted to helping arthritis caregivers).
- Information seeking habits; including the frequency a caregiver turns to family, friends, and other peers to obtain health care information; frequency a caregiver turns to mass media as a source of arthritis, health and general news and frequency a caregiver turns to health care providers for arthritis and care giving instructions as well as information
- Knowledge about the availability of arthritis information from general circulation publications and websites, national, regional and local health care organizations (such as the Arthritis Foundation) and community based support groups (for patients and caregivers).
- Assessment of a site's navigability, usability and readability. (Do users understand the information presented, is the readability level appropriate for the intended audience, do persons find it easy to obtain information and navigate through the website)?

To evaluate a caregiver's "gratifications" derived from the hypothetical website, variables might include attitudinal scales to measure the target audience's self-perceived:

- Susceptibility to arthritis (either personally or among family, peers and friends).
- Assessment if the personal benefits to provide care giving outweigh perceived financial, social and personal costs.
- Self-efficacy.
- Availability of social support networks (to reinforce care giving activities).
- Importance of a community or virtual social support network (to share ideas about care giving and to provide peer-to-peer communication).
- Evaluation of the credibility of the hypothetical website plus other health information websites (which provide arthritis instruction/information for caregivers) in addition to the perceived credibility of arthritis information provided by news organizations, health care providers, peers, friends and direct-to-consumer advertising.
- Salience of reinforcement by mass media and/or health care providers to encourage public care giving activities.
- Salience of emotional appeals in the mass media to generate interest in care giving (both in news and from other sources, such as direct to consumer advertising).
- Socio-cultural characteristics ascribed to persons with arthritis. (What's perceived as socially normative about persons with arthritis – what types of personality characteristics and psychographic profiles do persons ascribe to persons with arthritis and caregivers? This is to ascertain any correlation between socio-cultural attitudes and outcomes).

These variables, among others, could be integrated with standard demographic questions (about socio-economic status, age, gender, education) as well as questions about perceived health sta-

tus. Dependent variables could include: the extent of existing and planned involvement in caregiver activities and inclinations to become involved in more caregiver activities. This proposed evaluation could be a benchmark; periodic evaluations using the same instrument within the same region also might assess if publicity about the site, or other changes, increase consumer acceptance. At minimum, consumer interest, knowledge, motivations, attitudes and outcomes (consistent with the "uses and gratifications" approach and insights from the health campaign literature) could be evaluated systematically.

Conclusion

Essentially, a "uses and gratifications" approach is:

- Inclusive enough to counter some of the Institute of Medicine's criticisms of the second generation of health campaign research
- Can include many of the theories identified by the second generation of health campaign research and
- Seems to fit consumer health seeking behaviors on the internet.

As a result, "uses and gratifications" seems suited for evaluation applications in health informatics – especially where the desired outcomes are shifts in public knowledge, motivations, attitudes and clinical or social behaviors.

In conclusion, consumer informatics and health communication research both focus on how a communication methods have an impact on consumer decisions. In areas of consumer informatics evaluation where the desired outcomes are shifts in public knowledge, motivations, attitudes and clinical behaviors, adoption of health communication campaign research plus a "uses and gratifications" approach might yield more interactive, flexible and multidimensional evaluation tools. Moreover, this seems to be an ideal era to learn from and even contribute to allied disciplines, since as Eysenbach notes, consumer informatics evaluation research is at a formative stage [1]. Since health communication campaign research is at a crossroads, its models combined with a more interactive "uses and gratifications" approach foster a rare opportunity to simultaneously advance health communication campaign and consumer informatics evaluation research.

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