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The Benefits and Challenges of Multiple Health Behavior Change in Research and in Practice

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Abstract

Objective—The major chronic diseases are caused by multiple risks, yet the science of multiple health behavior change (MHBC) is at an early stage, and factors that facilitate or impede scientists' involvement in MHBC research are unknown. Benefits and challenges of MHBC interventions were investigated to strengthen researchers' commitment and prepare them for challenges.

Method—An online anonymous survey was emailed to listservs of the Society of Behavioral Medicine between May 2006 and 2007. Respondents ($N = 69$) were 83% female; 94% held a doctoral degree; 64% were psychologists, 24% were in public health; 83% targeted MHBC in their work.

Results—A sample majority rated 23 of the 24 benefits, but only 1 of 31 challenge items, as very-to-extremely important. Those engaged in MHBC rated the total benefits significantly higher than respondents focused on single behaviors, $F(1,69) = 4.21, p < .05$, and rated the benefits significantly higher than the challenges: paired $t(57) = 7.50, p < .001$. The two groups did not differ in ratings of challenges.

Conclusion—It appears individuals focused solely on single behaviors do not fully appreciate the benefits that impress MHBC researchers; it is not that substantial barriers are holding them back. Benefits of MHBC interventions need emphasizing more broadly to advance this research area.

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Keywords

multiple risks; health behavior change; interventions

Risky behaviors such as smoking, alcohol abuse, physical inactivity, and poor diet are detrimental to health and often co-occur. Most US adults meet criteria for multiple risk behaviors (Fine et al., 2004). Multiple risks multiply the healthcare burden both in terms of medical consequences and costs (Edington et al., 1997, Shinton, 1997).

There is an identified need for theoretical models, research paradigms and intervention infrastructure that cut across health behaviors (Orleans, 2004). A recent review concluded that “large gaps remain in our knowledge about the efficacy of interventions to address multiple behavioral risk factors” (Goldstein et al., 2004).

Intervening on single behaviors can be complex and challenging – treating multiple behaviors is even more so. To adequately inform new investigators and address barriers systematically, an understanding is needed of the benefits and challenges to multiple health behavior change (MHBC) interventions. Knowledge of the benefits serves to strengthen one’s rationale and commitment, whereas knowledge of the barriers serves to prepare one for the anticipated challenges (Janis and Mann, 1977). We define MHBC interventions as efforts to treat two or more health behaviors either simultaneously or sequentially within a limited time period (Prochaska and Prochaska, 2008). In working to identify a consensus, the findings may be useful for informing future research needs and facilitative efforts in the MHBC field.

Given the early stage of MHBC research, the study aims were primarily descriptive. We anticipated respondents who address multiple health behaviors would (1) rate the benefits of MHBC research more highly than respondents focused solely on singular risks and (2) weight the benefits of MHBC research significantly higher than the challenges.

Methods

Measurement Development

Members of the Society of Behavioral Medicine’s (SBM) Special Interest Group (SIG) on MHBC contributed to the initial list of benefits and challenges via group nominations during a SIG meeting and were invited to provide additional suggestions via the MHBC SIG listserv. Three experts in MHBC (JJP, CRN, BS) reviewed the complete list, identified main themes, deleted redundancies, and edited items to minimize double-barreled and unclear statements. The resulting survey was pilot tested with six individuals from the intended audience, and the survey was revised in response to pilot feedback.

The final measure consisted of 31 challenge items and 24 benefit items rated using 5-point Likert scales ranging from “not important” (coded 1) to “extremely important” (coded 5). For survey organization, the items were grouped into categories of Outreach and Approach, Settings and Systems, Client/Target Market, Theory Development and Testing, and Research Implementation. For analyses, the items were averaged in two scales with high internal consistency: Cronbach alphas .93 for benefits and .95 for challenges.

Data Collection

The University of California, San Francisco Institutional Review Board approved conduct of the study. Data were collected via a secure online survey between May 2006 and May 2007. Item ordering was random for each participant to prevent response bias. The online survey link was emailed to listservs for SBM’s MHBC, Physical Activity, Evidence-Based Behavioral

Medicine, Obesity, and Cancer SIGS and to researchers identified as publishing on MHBC. Respondents could answer the survey anonymously.

Results

Sample Characteristics

Of the 83 individuals who started the online survey, 71 completed all rating scale items, and 69 finished the survey in entirety. The sample was 83% female, 88% Caucasian, 9% Hispanic, and 3% Asian/Pacific Islander; 94% held a doctoral degree. The sample averaged 10.1 years (SD = 9.4, Range 0–37) since completing their terminal degree and 8.9 years (SD = 9.6, Range 0–42) of addressing MHBC in their research or practice. Less than half (42.9%) were MHBC SIG members; an additional 11% expressed interest in joining. Respondents identified their discipline(s) as psychology (64%), public health (24%), nursing (9%), medicine (3%), social work (1%), or other (10%). Primary work responsibilities were research (87%), teaching (24%), clinical practice (14%), and other (4%).

Respondents targeted a range of behaviors with most (83%) engaged in MHBC research or practice (Table 1). Compared to individuals focused on singular risks, individuals focused on MHBC were significantly more likely to target tobacco ($\chi^2(1) = 7.61, p < .01$), nutrition ($\chi^2(1) = 11.66, p < .01$), and stress management ($\chi^2(1) = 10.77, p < .001$). Respondents focused on MHBC were significantly more likely to apply the Transtheoretical Model than respondents focused solely on single behaviors ($\chi^2(1) = 4.87, p < .05$). No other theoretical approach distinguished MHBC versus single behavior change researchers (Table 1). Among the 58 respondents engaged in MHBC, 26 (44.8%) targeted MHBC with individuals, 16 (27.6%) with populations, and 16 (27.6%) with both individuals and populations. Among those engaged in MHBC, 28 (48.3%) also did work focused on single behavior change.

Ratings of Benefits and Challenges

Table 2 presents the mean ratings of each of the 55 benefit and challenge items shown in order from highest rated to lowest and the percent of the sample rating the item a 4 or 5 (very to extremely important). The highest rated 19 items were perceived benefits and the lowest rated 16 items were perceived challenges. A majority of respondents rated 23 of the 24 benefits and 1 of the 31 challenges as very to extremely important.

Respondents engaged in MHBC research or practice rated the total benefits of MHBC interventions ($M = 3.81, SD = .48$) significantly higher than those focused on single behavior change ($M = 3.46, SD = .78$), $F(1,69) = 4.21, p < .05$. There was no significant difference in rated challenges: $M = 2.98, SD = .74$ for MHBC respondents and $M = 3.11, SD = .61$ for respondents focused on single behavior change, $F(1,69) = 0.32, ns$.

Correlations between the benefits and challenges total scales approached zero for respondents focused on MHBC ($r = .08$) and those focused on single behavior change ($r = -.01$), indicating the two scales measured different constructs.

The benefits of MHBC interventions were rated significantly higher than the challenges, paired samples $t(70) = 7.06, p < .001$. When examined by group, the finding was specific to respondents engaged in MHBC: $t(57) = 7.50, p < .001$ for MHBC respondents and $t(11) = 1.23, p = .246$ for respondents focused on single behavior change.

The rated benefits and challenges did not differ by whether respondents were MHBC SIG members (p -values > .450).

Discussion

Risk behaviors tend to co-occur. Strategies that target multiple health behaviors for change may optimize delivery efficiency and impacts on health. The current study identified leading benefits and challenges to MHBC interventions as perceived by individuals engaged in behavioral medicine research and practice. The developed measure had an identifiable factor structure that corresponded to the benefits and challenges of MHBC. The findings may be useful for informing future research needs and directions.

Professionals engaged in MHBC gave significantly higher ratings to the benefits of this area of investigation relative to individuals focused on single behavior change. The two groups did not differ in their ratings of the perceived challenges. It appears that individuals focused solely on single behavior change have not fully bought into the benefits that impress MHBC researchers; it is not that there are substantial barriers holding them back. Respondents focused on single behavior change rated the benefits and challenges of MHBC equally; whereas, respondents engaged in MHBC rated the benefits significantly higher than the challenges.

Overall, a sample majority rated nearly all the benefits as very to extremely important, whereas, only one barrier was rated as very to extremely important – the challenge of developing integrated delivery systems for health behavior change. The highest rated benefits centered on the potential for greater real-world applicability for patients, healthcare, and affiliated systems; greater health improvements; and providing information on effective treatments for behaviors that co-occur. Though individuals engaged in MHBC rated the benefits as greatly outweighing the challenges, it is noteworthy that the MHBC SIG members nominated a greater number of challenges (31 items) than benefits (24 items).

In terms of theory, respondents engaged in MHBC were more likely to apply the Transtheoretical Model than those focused solely on singular risks. Developed in the area of smoking cessation, the Transtheoretical Model has demonstrated relevance to over 48 problem or target behaviors (Hall and Rossi, 2008) and may be particularly well suited to MHBC interventions (e.g., Prochaska et al., 2005; Prochaska et al., 2006). Social Cognitive Theory also was highly endorsed with application to both single and multiple risk behavior change.

Study limitations were the under-recruitment of professionals from health disciplines other than psychology and public health and those focused solely on singular risks. No monetary incentive for survey completion was offered. Those focused on singular risks may have been less interested in taking time to participate in a MHBC survey.

MHBC interventions offer great potential for advancing health promotion and disease prevention science and practice. A better understanding of the perspectives of early adopters may help support the growth and expansion of MHBC research. MHBC respondents averaged 8 years of experience in targeting multiple risks, and the response rate among MHBC SIG members (which numbered 49 in 2006) was 61%. In 2009, the MHBC SIG membership was 239 demonstrating impressive growth in interest in the field aided by support from leading funding agencies and the scientific community provided by groups like SBM. MHBC interventions offer the potential for greater real-world applicability and impacts on health. Broader promotion of the benefits of MHBC interventions may be key to expanding this research area.

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Table 1

Percent of Respondents to an Online Survey Conducted May 2006–2007 Endorsing Application of Specific Theories and Targeting Specific Health Behaviors by Whether Respondents' Focus Includes Multiple Health Behavior Change or is Solely on Single Behaviors

	Single Behaviors Only (n = 12)	Multiple Health Behaviors (n = 58)	Overall (N = 70)
<u>Applied Theory of Health Behavior</u>			
Social Learning/Social Cognitive Theory	75.0	75.9	75.7
Transtheoretical/Stages of Change Model*	41.7	74.1	68.6
Cognitive Behavioral Approaches	41.7	48.3	47.1
Learning Theories/Behavior Modification	16.7	37.9	34.3
Ecological Approaches	33.3	32.8	32.9
Relapse Prevention Model	25.0	31.0	30.0
Health Belief Model	25.0	32.8	31.4
Theory of Planned Behavior/Reasoned Action	16.7	25.9	24.3
<u>Targeted Health Behaviors</u>			
Physical activity	58.3	82.8	78.6
Nutrition*	25.0	75.9	67.1
Sedentary behavior	41.7	67.2	62.9
Smoking*	16.7	60.3	52.9
Stress management*	11.1	60.3	51.4
Alcohol or illicit drugs	16.7	41.4	37.1
Sexual health practices	25.0	31.0	30.0
Cancer screening behaviors	25.0	20.7	21.4
Sun exposure	0	15.5	12.9

* Significant group comparison, $p < .05$

Table 2
Benefits (B) and Challenges (C) to Multiple Health Behavior Change Interventions Identified by Individuals Engaged in Behavioral Medicine Research and Practice Responding to an Online Survey Conducted May 2006–2007

Multiple risk behavior change interventions...	Scale	n	Mean	SD	% 4 or 5
1. Provide greater real-world applicability (problems usually do not occur in a vacuum)	B	83	4.33	.90	89
2. Have the potential to result in greater improvements in the quality and length of life	B	80	4.17	.94	83
3. Address the multiple health risks of individuals and populations, more holistic approach	B	83	4.17	.99	79
4. Facilitate the translation of research into health care because most patients have multiple risks	B	71	4.03	.91	76
5. Provide more information about effective treatments for behaviors that commonly co-occur	B	80	4.00	.96	81
6. May reduce costs of treatment of diseases for patients and society	B	80	3.90	1.04	72
7. Make behavioral medicine more relevant to the system, health professionals, & individuals served; Matches the needs of real world settings	B	79	3.90	.94	75
8. Can address the attitudes and beliefs common across behaviors	B	83	3.86	1.16	69
9. Can teach people what is important for a healthy life (e.g., do all 4; don't smoke, healthy BMI, exercise 60 minutes a day, and eat 5 fruits and vegetables)	B	80	3.80	1.10	70
10. Can help determine common mediators of change across behaviors	B	74	3.74	.91	58
11. Increase the appeal of behavioral interventions to institutional audiences who want to improve more than just one health risk to justify making programmatic changes	B	74	3.74	.92	66
12. Provide one stop shopping for patients - they can participate in one program to help them change numerous behaviors instead of completing a separate program for each one	B	76	3.74	1.10	71
13. Allow for the basic principles of behavior change to be introduced once and applied to multiple behaviors, which can simplify multiple changes from the patient perspective	B	76	3.72	1.10	65
14. Can help determine common moderators of change across behaviors	B	74	3.68	.89	62
15. Allow for testing theories across behaviors	B	76	3.66	1.14	62
16. Allow for testing the generalization of behavior change	B	76	3.61	.98	61
17. Have the potential to give insight into optimal tailoring strategies (e.g., simultaneous vs. sequential, "levels" or "depth" of tailoring, tailoring vs. re-tailoring, etc)	B	76	3.59	1.18	59
18. Better meet marketplace forces (e.g., worksites/HMOs/schools want programs that address the multiple behavioral risks of users)	B	79	3.57	1.06	57
19. Consider the priorities of participants who may have limited access to resources supporting any type of health behavior change	B	74	3.54	1.01	51
20. Are challenged by the need for developing "integrated" systems	C	83	3.49	1.14	54
21. May reduce pharmaceutical costs for patients and society	B	83	3.48	1.19	52
22. Result in less patient burden (more efficient use of patient time with reduced burden due to multiple appointments, locations, providers)	B	71	3.48	1.13	55
23. More easily permit a choice of behaviors for individuals to work on	B	76	3.47	1.01	55
24. Make an efficient use of recruitment- individuals not screened out on single risk behavior	B	71	3.34	1.06	48
25. Require multiple expertise	C	71	3.28	1.23	49

Multiple risk behavior change interventions...	Scale	n	Mean	SD	% 4 or 5
26. Can be difficult with less research support (especially for early career investigators)	C	71	3.25	1.27	48
27. Require a greater magnitude for development and evaluation costs	C	71	3.20	1.06	38
28. Require more multivariate and comprehensive models of behavior change	C	74	3.18	1.28	42
29. Require more sophisticated and complex theoretical models of behavior and behavior change	C	76	3.14	1.27	40
30. Have the potential for complex cross-behavior interactions that are obscure or difficult to interpret	C	83	3.14	1.16	45
31. Require a greater response burden of participants	C	76	3.11	1.16	42
32. Increase retention difficulties	C	74	3.08	1.18	38
33. Place greater cognitive demands on participants with the potential to overwhelm them, particularly youth and older adults	C	76	3.05	1.20	41
34. Can make program development difficult, as there are infinite combinations of risk factors with which patients may present	C	71	3.01	1.25	38
35. Lack an ideal measure for evaluating outcomes	C	74	3.01	1.23	32
36. Require more sophisticated statistical modeling	C	76	3.01	1.31	37
37. Increase treatment fidelity difficulties	C	74	2.99	1.07	32
38. May result in interactions between interventions that are confounding/difficult to interpret	C	80	2.96	1.15	31
39. Facilitate the development and use of behavioral counseling skills for physicians	B	79	2.94	1.23	37
40. Can be too cumbersome from the consumers' perspective when including multiple validated instruments in the "real world" and not just in a research/clinical setting	C	79	2.91	1.17	35
41. Require more extensive pilot testing	C	74	2.91	1.27	37
42. Add complexity	C	71	2.90	1.20	34
43. Make it difficult to describe causal relationships among intervention components; with multiple components the individual effects will be harder to isolate	C	74	2.89	1.17	30
44. May be counterproductive in certain behaviors (such as smoking cessation and weight loss)	C	80	2.89	1.21	33
45. Face treatment delivery ambiguities	C	74	2.88	1.12	30
46. Have the potential for decreased efficacy on any single behavior	C	80	2.81	1.19	29
47. Face treatment delivery difficulties (e.g., simultaneous vs. sequential)	C	74	2.81	1.06	26
48. Increase recruitment difficulties	C	74	2.81	1.11	28
49. Place greater demands on delivery system	C	79	2.81	1.11	30
50. Make it difficult to discern the relative contribution of individual behavioral changes to desired outcomes (e.g., which behavioral change contributed the most to the reduction in systolic blood pressure?)	C	76	2.80	1.23	30
51. May result in cross-behavior interference (e.g., more exercise = more sun exposure)	C	83	2.80	1.24	25
52. Have the barriers to delivery of behavior change counseling in primary care multiplied (not my job, lack of expertise and training)	C	79	2.78	1.20	32
53. Lack any truly multiple behavior theory of behavior or behavior change for developing interventions or guiding data analysis or modeling	C	74	2.74	1.27	30
54. Result in less "clean" research designs	C	71	2.72	1.30	24
55. Do not allow for addressing one behavior at a time and allowing more specific assistance in a step-by-step process	C	76	2.54	1.09	18

Note: % 4 or 5 indicates the percent of the sample that rated the item as very to extremely important.