Article

HEALTH EDUCATION & BEHAVIOR

Health Education & Behavior
2016, Vol. 43(2) 201–207

DOI: 10.1177/1090198115599396
heb.sagepub.com
SAGE

Promoting Health by Addressing Basic Needs: Effect of Problem Resolution on Contacting Health Referrals

Tess Thompson, MPH, MPhil[1], Matthew W. Kreuter, PhD[1], and Sonia Boyum, MA, MS[1]

Abstract

Members of vulnerable populations have heightened needs for health services. One advantage of integrating health risk assessment and referrals into social service assistance systems such as 2-1-1 is that such systems help callers resolve problems in other areas (e.g., housing). Callers to 2-1-1 in Missouri (N = 1,090) with at least one behavioral risk factor or cancer screening need were randomly assigned to one of three health referral interventions: verbal referrals only, verbal referrals + a tailored mailed reminder, or verbal referrals + telephone health navigator. After 1 month, we assessed whether the nonhealth problems that prompted the 2-1-1 call had been resolved. Logistic regression estimated effects of having the problem resolved on calling a health referral. Callers were predominantly female (85%) and had a high school education or less (61%); nearly half (47%) had incomes under $10,000. The most common service requests were for utility assistance (35%), home/family problems (23%), and rent/mortgage assistance (12%). At follow-up, 38% of callers reported that all problems prompting their 2-1-1 call had been resolved, and 24% reported calling a health referral. Resolving all problems prompting the 2-1-1 call was associated with a higher odds of contacting a health referral (odds ratio = 1.44, 95% confidence interval [1.02, 2.05]) compared to people whose problems were not resolved. Multifaceted interventions that help meet non–health-related needs and provide support in reaching health-related goals may promote health in vulnerable populations.

Keywords

cancer, health promotion, prevention, social determinants of health, strategy, vulnerable populations

Basic human needs often trump health needs. When people cannot feed their families, pay the bills to keep their heat on, or pay the rent, getting a mammogram or colonoscopy (or any other health action) is understandably a secondary concern. Increasingly, public health professionals are realizing that it is important for health interventions to respond to individuals within their social context (Fielding, 2013). To improve health and reduce health disparities, public health professionals must find ways of addressing unmet basic needs in vulnerable populations.

Unmet basic needs do not simply co-occur with health disparities; they diminish people's ability to attend to health issues as well as their responses to interventions promoting health. In the popular press book *Scarcity: Why Having Too Little Means So Much* (2013), Mullainathan and Shafir, an economist and a psychologist, argue simply, "Scarcity captures the mind" (p. 7). The authors contend that the "mind orients automatically, powerfully toward unfulfilled needs" (p. 8) and demonstrate that unmet needs can lead to short-term thinking and poor decision making. Researchers have found, for example, that hungry participants in an experiment are more likely than nonhungry participants to focus on food-related words (Radel & Clément-Guillotin, 2012) and that simulating poverty in experimental conditions leads to decreased behavioral control (Spears, 2011). Mullainathan and Shafir (2013) suggest that helping people meet their basic needs may have positive spillover effects that can increase "bandwidth" (or mental capacity) and allow people to focus on longer term goals, including health goals.

Such ideas build on the work of Maslow (1970), who proposed that actions are motivated by needs, and needs are arranged in a hierarchy from physiological needs (the most basic level) to self-actualization needs (the highest level).

[1]Washington University in St. Louis, St. Louis, MO, USA

Corresponding Author:
Tess Thompson, Brown School of Social Work, Washington University in St. Louis, One Brookings Drive, Campus Box 1196, St. Louis, MO 63130, USA.
Email: tessthompson@wustl.edu

According to Maslow, having unmet basic needs results in anxiety or tension and a drive to relieve it. Only when this tension is relieved can a person focus on higher order needs, such as preventing or detecting cancer.

While the specific number, order, and sequence of progression through Maslow's levels of need have not been consistently supported empirically (Soper, Milford, & Rosenthal, 1995), there is stronger evidence for the simpler distinction between "deficiency" needs like food, water, shelter, and safety and "growth" needs related to social engagement, esteem, and self-actualization (Soper et al., 1995; Wahba & Bridwell, 1976). As applied to health behaviors, studies have shown that self-actualized individuals are more likely to engage in health-promoting behaviors, while those having unmet basic needs are significantly less likely to do so (Acton & Malathum, 2000; Blazer, Sachs-Ericsson, & Hybels, 2007; Sachs-Ericsson, Schatschneider, & Blazer, 2006; Timmerman & Acton, 2001).

These ideas have implications for a wide range of health-related decisions and actions, including cancer prevention behaviors such as smoking cessation, cancer screening, and human papillomavirus (HPV) vaccination. There is an educational gradient, for example, in whether people are up-to-date with screening; people with lower levels of education are less likely to be screened for these cancers (Smith, Brooks, Cokkinides, Saslow, & Brawley, 2013). Researchers have suggested that proximal factors related to socioeconomic status (e.g., stress) may influence health behaviors such as cancer screening (von Wagner, Good, Whitaker, & Wardle, 2011). People of lower socioeconomic status may be more likely to engage in "reactive responding" to immediate stressors, which can impede active planning in order to prevent negative long-term health outcomes (von Wagner et al., 2011). Lukwago et al. (2003) found that women with lower income and education levels were more likely to have a "present time orientation"—a focus on immediate or short-term consequences of their decisions—than women with higher levels of income and education; this present-time orientation was independently associated with lower levels of knowledge about breast cancer and a lower probability of ever having had a mammogram.

Addressing unmet basic needs in vulnerable individuals and populations may have the collateral benefit of increasing their bandwidth to make improvements in health. Partnerships between social service systems and health-focused programs reflect this approach, with the former addressing a person's basic needs and then making health referrals to the latter (Kreuter & Pfeiffer, 2013). A recent example is the integration of publicly available health services such as mammograms, Pap tests, and quit smoking hotlines within 2-1-1 information and referral helplines (Kreuter, 2012).

With systems available in all 50 states that cover approximately 91% of the U.S. population, 2-1-1 provides a telephone number to help people access referrals to social services (Daily, 2012; United Way, n.d. [http://www.211.org/]). Most people who call 2-1-1 do so because they are seeking help meeting basic needs for housing, food, and utilities (Eddens, Kreuter, & Archer, 2011). The 2-1-1 system may also be a promising way of reaching underserved populations to reduce health disparities (Hall et al., 2012; Kreuter, 2012; Linnan, 2012). Callers to 2-1-1 have higher unmet cancer control needs compared to the general population; a survey of callers in four states found that over two thirds had at least one unmet cancer control need (Purnell et al., 2012). Past work has shown that callers to 2-1-1 are generally receptive to answering questions about their health, and most are comfortable with receiving health information from 2-1-1 (Eddens et al., 2011). The National Cancer Institute Working Group on Tailored Cancer Communication endorses "contextualization" of health messages—that is, presenting such messages in a meaningful context—a tactic that can increase attention to, effortful processing of, and self-referential thinking in response to health information (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). 2-1-1 captures a person's reason for calling, which provides valuable information about the social context.

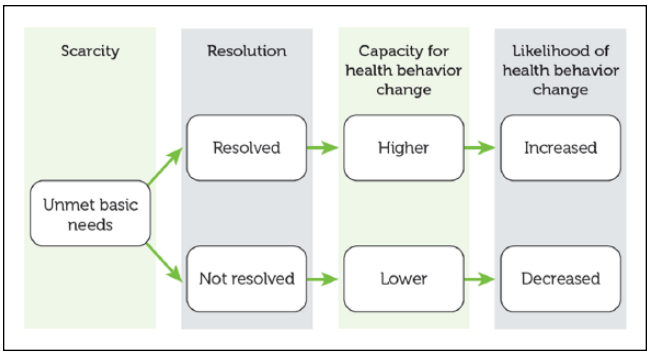

Figure 1. Conceptual model for the current study.

We performed secondary analyses on data from a randomized trial conducted among callers to 2-1-1 in Missouri (Kreuter et al., 2012) in order to explore these ideas about scarcity, unmet basic needs, and health behaviors. The original study tested strategies to connect 2-1-1 callers to preventive health resources available in their community. The outcome of interest in the current study is calling a health referral, an important step in behavior change. Focusing on a proximal health outcome such as contacting a referral is concordant with theories that frame behavior change as a multistep process (e.g., Prochaska & DiClemente, 1982), and can be seen reducing perceived barriers and providing a cue to action (Rosenstock, 1974). Although the ultimate goal of such efforts is health behavior change, the study provided referrals only, not behavioral interventions, and thus calling a referral is the end point for the current analyses.

We sought to determine whether resolving the basic needs problems that led people to call the 2-1-1 system would make them more likely to call a health referral compared to 2-1-1 callers whose basic needs problems were not resolved. The conceptual model for this study is illustrated in Figure 1. We

hypothesized that problem resolution would be associated with higher rates of calling a health referral.

Method

Data came from a randomized controlled trial of callers to the 2-1-1 system in Missouri, 2010-2012. Detailed information about recruitment and procedures of the original study has been provided elsewhere (Kreuter et al., 2012). Health referrals were related to six cancer prevention behaviors: calling a smoking cessation hotline, contacting the Environmental Protection Agency's Smoke-Free Homes and Cars program, calling a referral for screening services for one of three cancers (breast, colorectal, or cervical), and calling a referral for an HPV vaccine for the participant or participant's daughter. Callers who needed at least one of six cancer control services—mammogram, Pap test, colonoscopy, HPV vaccination, smoking cessation, smoke-free home rules—were randomized into one of three groups: (1) those who received verbal referrals to whichever health services they needed, (2) those who received verbal referrals and tailored reminders in the mail, and (3) those who received verbal referrals and interaction with a telephone health coach/navigator. A fourth group, controls who did not receive health referrals, are excluded from the current analyses. Referrals were made to local agencies or organizations providing free or low-cost health programs and services. Participants with multiple unmet cancer control needs could receive up to three referrals.

One month after enrollment, participants completed a follow-up telephone survey administered by research team members. The survey assessed whether the problem(s) that led participants to contact 2-1-1 had been resolved and whether participants had contacted the health referral(s) they received.

Measures

Baseline measures included participants' reason(s) for calling 2-1-1, their health needs, and demographic information. Follow-up measures administered 1 month later assessed whether the reason participants called 2-1-1 had been resolved ("problem resolution") and whether they had contacted any of the health referrals they received.

Reason for Calling 2-1-1. 2-1-1 Missouri uses a taxonomy of 2,000 categories and subcategories to classify callers' service requests, referred to here as "reasons for calling" (Alcaraz et al., 2012). For the purpose of this study, these were collapsed into eight broad groups: utilities, rent/mortgage, housing (e.g., finding housing, shelters), food assistance, employment, home and family (e.g., clothing, appliances, school supplies), health, and other.

Number of Service Requests. Callers to 2-1-1 could make up to three service requests (range 1-3).

Initial Cancer Risk Assessment. Items based on the 2008 Behavioral Risk Factor Surveillance System measured smoking and smoke-free home rules; HPV vaccination for self and/or daughter; and screening for breast, cervical, and colon cancer (Centers for Disease Control and Prevention, 2008). These measures were used to determine which health referral(s) each participant would receive, and not all measures applied to all participants (e.g., eligibility for screening and vaccination depends on age and/or sex).

Demographics. Participants' gender, race/ethnicity, income, education, employment status, and health insurance status data were obtained. Race was collapsed into three categories: Black, White, and other (predominantly Hispanic and multiracial). Income was dichotomized (<$10,000/year vs. ≥$10,000/year), as was employment (currently employed vs. not currently in the workforce—this latter category included people who were unemployed, retired, or unable to work; students; and homemakers). Health insurance status was coded as insured versus uninsured.

Contacting a Referral. At 1-month follow-up, participants were asked whether they had contacted each of the health referrals they received (yes/no for each referral). The primary outcome in these analyses was whether a participant had contacted at least one of the referrals.

Problem Resolution. At follow-up, participants were asked whether the problem(s) that led them to call 2-1-1 had been resolved (yes/no for each problem). In the analyses presented here, the problem resolution variable was collapsed to make it dichotomous (all problems resolved vs. at least one problem not resolved).

Data Analysis

All analyses were conducted in SAS Version 9.4 (Cary, NC). Bivariate analyses (chi-square tests and *t* tests, as indicated in Table 1) were used to compare participants whose problems were resolved with participants whose problems were not resolved. Binary logistic regression was used to estimate the odds of calling a health referral based on whether a participant's problems were resolved, controlling for study group and number of service requests. Following the recommendation of Hernández, Steyerberg, and Habbema (2004), because this was a randomized controlled trial with a binomial outcome, we controlled for demographic variables in the analyses, including gender, race, income, education, employment, and insurance status. Effect modification between type of problem and problem resolution was assessed and found not to be significant.

Results

Table 1 presents information about participant characteristics. The sample was predominantly female (86%) and Black

Table 1. Participant Characteristics by Problem Resolution for Callers to 2-1-1 in Missouri.

Participant characteristics	Problem resolved, %		p^a
	Yes	No	
All (*N* = 940)	38.2	61.8	
Age, *M* (*SD*), years	41.6 (12.6)	45.3 (12.9)	<.0001
Gender			
Female (*N* = 803)	37.9	62.1	.6104
Male (*N* = 137)	40.2	59.9	
Race/ethnicity			
White (*N* = 286)	41.6	58.4	.1522
Black (*N* = 550)	35.6	64.4	
Other (*N* = 96)	42.7	57.3	
Income, $			
≤10,000 (*N* = 402)	37.1	62.9	.4211
>10,000 (*N* = 504)	39.7	60.3	
Education, years			
≤12 (*N* = 570)	37.2	62.8	.4154
>12 (*N* = 369)	39.8	60.2	
Employment			
Employed (*N* = 180)	48.9	51.1	0.0010
Not in workforce (*N* = 760)	35.7	64.3	
Health insurance			
Insured (*N* = 562)	39.9	60.1	.1998
Uninsured (*N* = 378)	35.7	64.3	
Study group			
Referrals only (*N* = 312)	35.6	64.4	.1803
Tailored materials (*N* = 321)	36.8	63.2	
Navigators (*N* = 307)	42.4	57.7	
No. of problems			
1 (*N* = 543)	53.0	47.0	<.001
2 (*N* = 240)	20.0	80.0	
3 (*N* = 157)	14.7	85.4	
Called any health referral			
Yes (*N* = 224)	44.6	55.4	.0228
No (*N* = 716)	36.2	63.8	

[a]*p* value based on *t* test or chi-square test.

(59%), and nearly half (47%) reported an annual income of under $10,000. At 1-month follow up, over one third of the participants (38%) reported that all problems that led them to call 2-1-1 had been resolved. Just under one quarter (24%) of participants had contacted at least one health referral. People who reported that their problems had been resolved were more likely to be younger and employed than people whose problems were not resolved, and they were more likely to have made only one 2-1-1 service request. In bivariate analyses, problem resolution also had a significant positive correlation with contacting a health referral.

Table 2 shows participants' reasons for calling 2-1-1. The most common reasons for calling 2-1-1 related to utilities (35%), home/family (23%), rent/mortgage assistance (12%), and food assistance (8%).

Table 3 shows the results of the logistic regression. Participants who had their problems resolved were more likely to call a referral than those who did not (odds ratio [OR] = 1.44, 95% confidence interval [CI: 1.02, 2.05]). In addition,

Table 2. Types of Services Requested by Participants Who Called 2-1-1 Missouri.

Services	Total requests	% of total requests
Utilities	605	35
Home and family	395	23
Rent/mortgage	206	12
Food assistance	138	8
Other	129	8
Health	105	6
Employment	94	5
Housing	56	3

Note. *N* = 1,090 participants with 1,728 service requests; participants could request up to three services per call.

Table 3. Odds Ratio Estimates for Variables Included in the Model Predicting Whether Study Participants Called a Health Referral (*N* = 899).

Variable	Estimate	95% confidence limits
All problems resolved (reference = no)	1.44	[1.02, 2.05]
Navigators compared to referrals only	2.73	[1.83, 4.06]
Navigators compared to tailored materials	1.81	[1.25, 2.61]
No. of health referrals	1.02	[0.81, 1.28]
Gender (reference = male)	1.51	[0.94, 2.43]
Race (reference = White)		
Black	1.43	[0.98, 2.08]
Other	2.34	[1.35, 4.05]
Annual income (reference = >$10,000)	1.14	[0.82, 1.58]
Education (reference = >12 years)	1.30	[0.93, 1.82]
Employment (reference = not in workforce)	0.66	[0.42, 1.04]
Insured (reference = uninsured)	0.66	[0.48, 0.92]

participants in the navigator group were more likely to call a referral than those who received tailored materials (OR = 1.81, 95% CI [1.25, 2.61]) or referrals only (OR = 2.73, 95% CI [1.83, 4.06]). Because of these effects of both problem resolution and study group, we conducted a chi-square test to determine whether problem resolution differed by study group; there was not a significant difference ($p = .18$).

Discussion

Health disparities persist despite considerable efforts to reduce them. Our results provide support for the idea that helping people meet nonhealth basic needs may increase the likelihood that they consider adopting recommended health behaviors. If "[s]carcity captures the mind" (Mullainathan & Shafir, 2013, p. 7), helping people resolve problems such as those that prompt them to call 2-1-1 can free up "bandwidth" to focus on health behaviors with long-term benefits, such as calling a smoking cessation line or calling referrals for screening exams.

In our analyses, problem resolution of basic needs such as housing, heating and cooling, and food was significantly associated with contacting a health referral for a needed cancer control service. Callers to 2-1-1 who reported that all of the problems that led them to call 2-1-1 were resolved were over 40% more likely to contact at least one referral than those whose problems remained unresolved. We also found that even when problem resolution is taken into account, the effect for study group is strong. Access to the help and resources provided by health navigators is more effective in prompting callers to contact a health referral than were either tailored materials or referrals only. This is congruent with both our prior analyses (Kreuter et al., 2012) and other research showing that navigators are an effective health promotion strategy (Freeman, Muth, & Kerner, 1995; Jandorf, Gutierrez, Lopez, Christie, & Itzkowitz, 2005; Pedersen & Hack, 2010; Percac-Lima et al., 2009; Robinson-White, Conroy, Slavish, & Rosenzweig, 2010). Health navigators are a very promising resource for connecting underserved populations to health services.

The study findings provide potentially promising insights about health promotion in vulnerable populations. To the extent that information and referral systems and social service agencies help people address basic needs, partnering with organizations such as 2-1-1 may enhance the effectiveness of public health in general and health behavior interventions in particular. Given the populations served by 2-1-1, the Supplemental Nutrition Assistance Program, public housing, the Low-Income Home Energy Assistance Program, and similar agencies, this partnering strategy seems especially valuable in support of efforts to eliminate health disparities (Kreuter, 2012).

Important research questions remain. Our analyses cannot determine, for example, whether problem resolution among 2-1-1 callers was a result of help they received from 2-1-1, their own resourcefulness, a strong support network, or some combination of these and/or other factors. Future research could help answer this question. In addition, although our conceptual model held that resolving problems would affect calling a health referral, both problem resolution and calling a referral were assessed at 1-month follow-up. We know that both happened after the baseline survey, but we do not know which happened first. Future research can more fully test the proposed conceptual model by clarifying mediating pathways and establishing the temporal sequence of the proposed relationship between basic needs, problem resolution, and health behavior actions. Future research can also assess the reliability of self-report in assessing whether participants contacted referrals. Although there is indication that cancer control needs among 2-1-1 callers are comparable across several states (Purnell et al., 2012), more research about characteristics of 2-1-1 callers at the national level would help determine the extent to which these findings may generalize to other populations.

Implications for Practice

A range of strategies are needed to reach vulnerable populations and encourage behaviors—such as smoking cessation and cancer screening—that promote long-term health. Public health professionals have long acknowledged that an individual's health is affected by not only individual characteristics and behaviors but also the social environment, the built environment, and the policy context (Bronfenbrenner, 1995; Stokols, 1996). There is a growing consensus that when seeking to change behavior, health educators should consider an individual's social context, including unmet needs in areas other than health (Fielding, 2013).

Unfortunately, integrating this perspective into the operational approach of specific health behavior interventions has lagged. Such integration requires a commitment and capacity to help people address nonhealth basic needs. Many public health and health promotion organizations may not feel adequately prepared to tackle this challenge. Fortunately, their counterparts in social services are. Forging partnerships with such agencies holds promise for helping resolve the unmet basic needs of vulnerable populations and following up with evidence-based and audience-appropriate interventions to encourage preventive and therapeutic health behaviors.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was supported by funding from the National Cancer Institute (Grant P50-CA095815 to PI Matthew Kreuter).

References

Acton, G., & Malathum, P. (2000). Basic need status and health-promoting self-care behavior in adults. *Western Journal of Nursing Research*, *22*, 796-811

Alcaraz, K. I., Arnold, L. D., Eddens, K. S., Lai, C., Rath, S., Greer, R., & Kreuter, M. W. (2012). Exploring 2-1-1 Service requests as potential markers for cancer control needs. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S469-S474.

Blazer, D. G., Sachs-Ericsson, N., & Hybels, C. F. (2007). Perception of unmet basic needs as a predictor of depressive symptoms among community-dwelling older adults. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *62*, 191-195.

Bronfenbrenner, U. (1995). Developmental ecology through space and time: A future perspective. In P. Moen, G. H. Elder, & K. Luscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 619-647). Washington, DC: American Psychological Association.

Centers for Disease Control and Prevention. (2008). *Behavioral Risk Factor Surveillance System survey questionnaire*. Atlanta, GA: Author.

Daily, L. S. (2012). Health research and surveillance potential to partner with 2-1-1. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S422-S424.

Eddens, K. S., Kreuter, M. W., & Archer, K. (2011). Proactive screening for health needs in United Way's 2-1-1 information and referral service. *Journal of Social Service Research*, *37*, 113-123.

Fielding, J. E. (2013). Health Education 2.0: The next generation of health education practice. *Health Education & Behavior*, *40*, 513-519.

Freeman, H. P., Muth, B. J., & Kerner, J. F. (1995). Expanding access to cancer screening and clinical follow-up among the medically underserved. *Cancer Practice*, *3*, 19-30.

Hall, K. L., Stipelman, B. A., Eddens, K. S., Kreuter, M. W., Bame, S. I., Meissner, H. I., . . .Fernández, M. E. (2012). Advancing collaborative research with 2-1-1 to reduce health disparities: Challenges, opportunities, and recommendations. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S518-S528.

Hawkins, R. P., Kreuter, M. W., Resnicow, K., Fishbein, M., & Dijkstra, A. (2008). Understanding tailoring in communicating about health. *Health Education Research*, *23*, 454-466.

Hernández, A. V., Steyerberg, E. W., & Habbema, J. D. F. (2004). Covariate adjustment in randomized controlled trials with dichotomous outcomes increases statistical power and reduces sample size requirements. *Journal of Clinical Epidemiology*, *57*, 454-460.

Jandorf, L., Gutierrez, Y., Lopez, J., Christie, J., & Itzkowitz, S. H. (2005). Use of a patient navigator to increase colorectal cancer screening in an urban neighborhood health clinic. *Journal of Urban Health*, *82*, 216-224.

Kreuter, M. W. (2012). Reach, effectiveness, and connections: The case for partnering with 2-1-1. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S420-S421.

Kreuter, M. W., & Pfeiffer, D. (2013). Transdisciplinary problem solving for integrating public health and social service systems to address health disparities. In D. Haire-Joshu & T. McBride, (Eds.), *Transdisciplinary public health: Research, methods, and practice* (pp. 249-264). San Francisco, CA: Jossey-Bass.

Kreuter, M. W., Eddens, K. S., Alcaraz, K. I., Rath, S., Lai, C., Caito, N., . . .Roux, A. M. (2012). Use of cancer control referrals by 2-1-1 callers: A randomized trial. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S425-S434.

Linnan, L. A. (2012). Research collaboration with 2-1-1 to eliminate health disparities: An introduction. *American Journal of Preventive Medicine*, *43*(6 Suppl. 5), S415-S419.

Lukwago, S. N., Kreuter, M. W., Holt, C. L., Steger-May, K., Bucholtz, D., & Skinner, C. S. (2003). Socio-cultural correlates of breast cancer knowledge and screening in urban African American women. *American Journal of Public Health*, *93*, 1271-1274.

Maslow, A. (1970). *Motivation and personality* (2nd ed.). New York, NY: Harper & Row.

Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why having too little means so much*. New York, NY: Times Books.

Pedersen, A., & Hack, T. F. (2010). Pilots of oncology health care: A concept analysis of the patient navigator role. *Oncology Nursing Forum*, *37*, 55-60.

Percac-Lima, S., Grant, R. W., Green, A. R., Ashburner, J. M., Gamba, G., Oo, S., . . .Atlas, S. J. (2009). A culturally tailored navigator program for colorectal cancer screening in a community health center: A randomized, controlled trial. *Journal of General Internal Medicine*, *24*, 211-217.

Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice*, *19*, 276-288.

Purnell, J. Q., Kreuter, M. W., Eddens, K. S., Ribisl, K. M., Hannon, P., Williams, R. S., . . .Fagin, D. (2012). Cancer control needs of 2-1-1 callers in Missouri, North Carolina, Texas, and Washington. *Journal of Health Care for the Poor and Underserved*, *23*, 752-767.

Radel, R., & Clément-Guillotin, C. (2012). Evidence of motivational influences in early visual perception: Hunger modulates conscious access. *Psychological Science*, *23*, 232-234.

Robinson-White, S., Conroy, B., Slavish, K. H., & Rosenzweig, M. (2010). Patient navigation in breast cancer: A systematic review. *Cancer Nursing*, *33*, 127-140.

Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, *2*, 328-335.

Sachs-Ericsson, N., Schatschneider, C., & Blazer, D. G. (2006). Perception of unmet basic needs as a predictor of physical functioning among community-dwelling older adults. *Journal of Aging and Health*, *18*, 852-868.

Soper, B., Milford, G., & Rosenthal, G. (1995). Belief when evidence does not support theory. *Psychology & Marketing*, *12*, 415-422.

Smith, R. A., Brooks, D., Cokkinides, V., Saslow, D., & Brawley, O. W. (2013). Cancer screening in the United States, 2013. *CA: A Cancer Journal for Clinicians*, *63*(2), 87-105.

Spears, D. (2011). Economic decision-making in poverty depletes behavioral control. *B.E. Journal of Economic Analysis & Policy*, *11*(1). Retrieved from http://riceinstitute.org/wordpress/wp-content/uploads/downloads/2011/12/depletion-published.pdf

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*, *10*, 282-298.

Timmerman, G., & Acton, G. (2001). The relationship between basic need satisfaction and emotional eating. *Issues in Mental Health Nursing*, *22*, 691-701

von Wagner, C., Good, A., Whitaker, K. L., & Wardle, J. (2011). Psychosocial determinants of socioeconomic inequalities in cancer screening participation: A conceptual framework. *Epidemiologic Reviews*, *33*, 135-47. doi:10.1093/epirev/mxq018

Wahba, M., & Bridwell, L. (1976). Maslow reconsidered: A review of research on the need hierarchy theory. *Organizational Behavior and Human Performance*, *15*, 212-240.