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Unmet basic needs and health intervention effectiveness in low-income populations

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ABSTRACT

In the face of unmet basic needs, low SES adults are less likely to obtain needed preventive health services. The study objective was to understand how these hardships may cluster and how the effectiveness of different health-focused interventions might vary across vulnerable population sub-groups with different basic needs profiles. From June 2010–2012, a random sample of low-income adult callers to Missouri 2-1-1 completed a cancer risk assessment and received up to 3 health referrals for needed services (mammography, pap testing, colonoscopy, HPV vaccination, smoking cessation and smoke-free home policies). Participants received either a verbal referral only (N = 365), verbal referral + tailored print reminder (N = 372), or verbal referral + navigator (N = 353). Participants reported their unmet basic needs at baseline and contacts with health referrals at 1-month post-intervention. We examined latent classes of unmet basic needs using SAS. Logistic regression examined the association between latent classes and contacting a health referral, by intervention condition. A 3 class solution best fit the data. For participants with relatively more unmet needs (C2) and those with money needs (C3), the navigator intervention was more effective than the tailored or verbal referral only conditions in leading to health referrals contacts. For participants with fewer unmet basic needs (C1), the tailored intervention was as effective as the navigator intervention. The distribution and nature of unmet basic needs in this sample of low-income adults was heterogeneous, and those with the greatest needs benefitted most from a more intensive navigator intervention in helping them seek needed preventive health services.

1. Introduction

Poverty has a negative effect on health outcomes (Fiscella and Williams, 2004; DeFur et al., 2007; Harper and Lynch, 2007; Goldman and Smith, 2002), even after accounting for health risk behaviors that are more prevalent in low SES populations (Lantz et al., 2001). Although poverty is most often measured with monetary indicators like income and income-to-needs ratios (McDonough et al., 2005), multidimensional measurement approaches that consider deprivation across multiple life domains and cumulative hardship provide a richer, more accurate representation of poverty (DeWilde, 2004).

Among these alternative indicators are so-called "basic needs" like adequate housing, food security, personal and neighborhood safety, ability to pay bills and possession of essential material goods. Controlling for income, education, and other demographic characteristics, having greater unmet basic needs is associated with declining physical functioning, increased depression and mortality, and being "high cost users" of health care services (Blazer et al., 2005; Sachs-Ericsson et al., 2006; Blazer et al., 2007; Fitzpatrick et al., 2015).

There are 46.7 million people in poverty in the U.S. (U.S. Census Bureau, 2015), and although there is currently no national surveillance system for basic needs, a similar number (49 million) are classified as food insecure (Feeding America, n.d.) and over half of those in poverty (52%) are classified as having "severe housing cost burden", defined as spending >50% of their income on housing (Desmond, 2015).

There is variability in how unmet basic needs are experienced by vulnerable populations and the degree to which specific basic needs are associated with income-based indicators of poverty as well as health outcomes. For example, even among those within the same income-to-needs ratio category, the types and patterns of unmet basic needs reported differ by family structure and other characteristics (Mayer and Jencks, 1989). And while some basic needs like food security and paying bills are strongly associated with monetary definitions of poverty, other needs like quality housing and neighborhood safety are less strongly associated (Iceland and Bauman, 2007). Food insecurity is also strongly associated with high cost health care utilization (Fitzpatrick et al., 2015).

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Given the impact of unmet basic needs on health outcomes and the heterogeneity of unmet basic needs experienced by low-income populations, the objective of this study was to understand how these hardships may cluster and how the effectiveness of different health-focused interventions might vary across vulnerable population subgroups with different basic needs profiles. This secondary analysis of a unique prospective intervention study addresses both questions.

2. Methods

The Institutional Review Board at Washington University in St. Louis approved this study. The parent study that provided the data for this secondary analysis is registered in ClinicalTrials.gov (#NCT01027741).

2.1. Study setting

The study took place at United Way 2-1-1 Missouri, a telephone information and referral helpline that serves 99 of 114 counties in the state and received 160,000 calls in 2013. 2-1-1 is a federally designated dialing code (like 9-1-1 for emergency services) that links callers to health and social services in their community (Daily, 2012). Callers are predominantly poor and seeking help with basic needs like paying utility bills and getting food (Kreuter, 2012; Thompson et al., 2016). Although relatively few callers contact 2-1-1 about health services, studies have shown that the health needs of 2-1-1 callers greatly exceed those of the general population (Purnell et al., 2012; Kreuter et al., 2012; Eddens et al., 2011).

2.2. Study sample and recruitment

From June 2010 to June 2012, after receiving standard service, a random sample of callers to 2-1-1 Missouri was selected to participate in a surveillance phase of the project by completing a brief health risk assessment. Of these, 10,472 callers (58%) were eligible for the risk assessment (age ≥ 18, living in Missouri, English-speaking, calling with a service request for themselves, willing to provide date of birth and gender, not currently in extreme crisis). Nearly all of these (95%; n = 9947) were invited to take the risk assessment and 4761 (48%) completed it. Completers with at least one prevention need (n = 3816) were invited to participate in the trial phase of the project, a longitudinal intervention study. Those who agreed, consented and completed a baseline assessment (n = 1521; 40%) were then randomized to one of three study groups. Participants who also completed the 1-month follow up (n = 1090; 72%) comprise the analysis sample.

Drop-out rates did not differ by study group, nor were drop-outs different from completers in experiencing any of the seven unmet basic needs. They were younger (39.7 vs. 43.9 years) and more likely to be poor (62% vs. 55% income <$10K/year), employed (29% vs. 19%) and have a child at home (63% vs. 51%). Additional details of the study design and methods are available in a previous report (Kreuter et al., 2012).

2.3. Risk assessment to identify prevention needs

Items from the 2008 Behavioral Risk Factor Surveillance System were used to assess needs for mammography, Pap testing, colonoscopy, HPV vaccination for self and daughter, smoking cessation and smoke free home policies, recommended prevention behaviors that are available for free or low cost to low-income populations in most states. Referrals were offered to women ages 40 and older who had no mammogram in the last year; women ages 18 and older who had no Pap test with the last two years[1]; men and women ages 50 and older who had no colonoscopy in the last 10 years; women ages 18–26 and those with a female child ages 9–17 years old living in their home who had not received the HPV vaccination; current smokers; and those without a total ban on smoking in their household. Prevention referrals were limited to three per caller consistent with standard 2-1-1 procedure.

If a caller had more than three needs, a prioritization algorithm determined which health referrals he or she received. In descending order, the priorities were: colonoscopy, mammography, HPV vaccine for self or girl in home, Pap test, smoking cessation, and smoke free home policy. This order was set to maximize statistical power for each health outcome based on the expected proportion of the sample (from lowest to highest) that would need the referral, not on the public health importance or the strength of evidence for the recommended cancer control measure.

2.4. Interventions

Participants were randomized to one of three intervention groups. Of those who completed the baseline and 1 month follow up, 365 (34%) received verbal referral only, 372 (34%) received verbal referral + tailored print reminder, and 353 (32%) received verbal referral + navigation.

2.4.1. Verbal referral

Based on each caller's responses to the risk assessment questions, a computer algorithm identified and prioritized their prevention needs, which were addressed moments later by a 2-1-1 information specialist who delivered a scripted referral (Kreuter et al., 2012). Referrals consisted of three parts: (Fiscella and Williams, 2004) *risk assessment feedback* (e.g., "You said you've never had a mammogram"); (DeFur et al., 2007) *recommended action and importance* (e.g., "Once you turn 40, getting a mammogram every 1 to 2 years is the best way to fight breast cancer. Mammograms can find breast cancer when it's easier to treat and cure"); and, (Harper and Lynch, 2007) *offer of referral* to a free or low-cost service (e.g., "There's a good chance you can get a free mammogram through a program called Show Me Healthy Women. Would you like the phone number for that program?"). For each accepted referral, the information specialist identified the closest service provider to the caller's residence and verbally shared the referral phone number and/or address, information about its hours of operation, and documentation that may be required to obtain services.

2.4.2. Tailored print reminder

Within one working day of receiving the verbal referral, participants in this group were mailed a printed tailored reminder (4-page full color booklet) of the health referral they received. The reminder consisted of: (Fiscella and Williams, 2004) a short *personal story* tailored to the problem that led the participant to call 2-1-1 and the prevention referral to which the participant has been referred (i.e., modeling (Lemelin et al., 2009)); (DeFur et al., 2007) an accompanying *matched photo* personalized to the participant's age, race, and gender; (Harper and Lynch, 2007) *action details* providing a clear and simple summary of information the caller would need to access the prevention referral(s); and (Goldman and Smith, 2002) *motivation and preparation* information describing why the preventive health service was important and suggesting questions to ask when contacting the referral. All content adhered to health literacy and health communication best practices, and was written at a Flesch-Kincaid 4th Grade Level. The tailored personal story addressed up to three cancer-control needs.

2.4.3. Navigator/health coach

Navigators (called "coaches" to participants) explained each needed preventive health service and its importance, answered callers' questions, elicited and addressed barriers to action with a

[1] Recommendations for Pap testing changed during the study period. In the first four months of recruitment, women ages 18–26 were offered referrals if they had not Pap test in the last year.