1-29-2017

Healthcare Use Self-Efficacy in Adults Who Are Homeless

Jared Ian Israel
University of Missouri-St. Louis, jared.israel@umsl.edu

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Jared I. Israel

M.A., Clinical Psychology, University of Missouri-St. Louis, 2012
B.A., Psychology and Biology & Society, Cornell University, 2008

Dissertation submitted to the Graduate School at the University of Missouri-St. Louis
in partial fulfillment of the requirements for the degree
Doctor of Philosophy in Clinical Psychology

August, 2016

Committee Members:

Kamila S. White, Ph.D. (chair)

Zoë Peterson, Ph.D.

Gary Morse, Ph.D.

Brian Vandenberg, Ph.D.

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Abstract

The physical and mental health care needs of homeless adults are extensive. However, these needs regularly go unmet. Healthcare use behavior is complex and involves a range of obstacles. As such, self-efficacy, an individual's belief in his or her ability to perform a given behavior, appears to be a relevant factor in healthcare use. While current theory supports this notion and research has confirmed the role of self-efficacy in health behavior generally, a validated measure of healthcare use self-efficacy has not previously existed. The aim of this study was to develop and validate the Healthcare Use Self-Efficacy List (HUSEL) in a sample of homeless adults. Qualitative data collected from homeless adults ($N = 10$) and case managers ($N = 7$) were used to ensure that questionnaire items meaningfully reflect the challenges faced in healthcare utilization. A series of analyses involving a larger sample of homeless of adults ($N = 131$) demonstrated that the HUSEL has sound validity and reliability properties. Results also indicated that healthcare use self-efficacy is associated with number of non-urgent, ambulatory care visits in the past year, presence of unmet medical/surgical need in the past year, and perceived mental health status. The findings are reviewed in light of the existing literature. Clinical implications and future directions are also discussed.

Healthcare Use Self-Efficacy in Adults Who Are Homeless

Self-efficacy, or confidence in one's capability to perform a particular action, predicts and explains a range of health behaviors. Due to its modifiable nature, this cognitive factor has received a great deal of attention in the field of health psychology. Healthcare utilization is a challenging health behavior that is difficult to initiate and maintain. Research in self-efficacy specific to healthcare use is vital in the homeless population, where rates of rates of health impairment are high and levels of unmet healthcare need are severe. However, there has not been a suitable assessment tool to facilitate that research. To my knowledge, there have been no published studies designed to develop and validate a measure of healthcare use self-efficacy for research in the homeless adult population.

This section begins with an overview of the healthcare needs of homeless adults. Healthcare use in this population is examined with a focus on the multitude of barriers that impair access to services. We then transition to a discussion of self-efficacy theory and related empirical findings in the areas of health behavior generally and healthcare utilization specifically. To conclude, I review the few efforts that have been made to assess healthcare use self-efficacy before describing study hypotheses.

Healthcare Needs of Homeless Adults: Severe and Unmet

Homeless adults are a large, heterogeneous group. Population estimates in the United States range from 633,782 to over 3.5 million (HUD, 2012; National Law Center on Homeless and Poverty, 2007). Although estimates vary due to differences in assessment methods (Link et al., 1994) and definitions of homelessness (Tipple &

Speak, 2005), it remains indisputable that a sizeable proportion of this country experiences homelessness. Further, this population has become increasingly diverse over the past three decades. The number of women and older adults, particularly in the range of 50-64 years, has grown substantially (Meschede, Sokol, & Raymond, 2004; Stergiopoulos & Herrmann, 2003; U.S. Conference of Mayors, 2006). In regards to race and ethnicity, one large scale, multi-city study found that 42% of the homeless population was African-American, 39% was Caucasian, 13% was Hispanic, and 6% was Asian or Native American (U.S. Conference of Mayors, 2006). The size and heterogeneity of this population contributes to the volume and variability of healthcare needs that homeless adults exhibit (Stephens, Dennis, Toomer, & Holloway, 1991).

Rates of physical illness are elevated among homeless adults. Chronic conditions such as cardiovascular disease (Lee et al., 2005), diabetes (Amarasingham, Spalding, Anderson, 2001), asthma (Snyder & Eisner, 2004), and liver disease (Leburn-Harris et al., 2013) are disproportionately represented. Infectious diseases are also overly common, including hepatitis (Gelberg et al., 2012) and tuberculosis (Moss et al., 2000). Similar trends exist regarding sexually transmitted infections (Caton et al., 2013). Indeed, HIV seroprevalence is more than five times than what is detected in the general population (Robertson et al., 2004).

Harsh living conditions constitute an additional set of health risks. Frostbite and other exposure-related injuries occur frequently in homeless adults (Kowal-Vern & Latenser, 2007; New York City Departments of Health and Mental Hygiene and Homeless Services, 2005). Skin ailments related to over-crowded accommodations

and barriers to sufficient hygiene are commonplace, and the incidence of impetigo, ecthyma, and cellulitis is significantly greater in the homeless population than in the general public (Badiga et al., 2005; Raoult, Foucault, & Broqui, 2001). Most disturbing however, are the staggering levels of victimization that occur. In a multi-city study involving over 500 homeless adults, 49% reported that they had been victims of a violent attack (Meinbresse et al., 2014). Another large-scale study found that nearly 30% of homeless adults had suffered sexual or physical abuse in only the past year (Kushel, Evans, Perry, Robertson, & Moss, 2003).

Mental illness also occurs frequently in homeless adults. Studies estimate that between one-fifth and one-third meet criteria for a current mental disorder (North, Eyrich, Pollio, & Spitznagel, 2004; Sullivan, Burnam, Koegel, & Hollenberg, 2000), with major depressive disorder, bipolar disorder, panic disorder, and schizophrenia diagnosed most frequently (Fazel, Khosla, Doll, & Geddes, 2008; Folsom & Jeste, 2002). These mental disorders often co-occur with substance use disorders (Koegel, Sullivan, Burnam, Morton, & Wenzel, 1999). Another prevalence study found that over two-thirds of homeless adults endorsed a lifetime history of a substance use disorder (Roberston, Zlotnik, & Westerfelt, 1997).

In sum, homeless adults suffer from an expansive range of physical and mental health conditions at exceedingly high levels. Health problems act as a risk factor for both the onset and maintenance of homelessness, and individuals often find themselves trapped in a vicious cycle of deteriorating health and more deeply entrenched homelessness (McMurray-Avila, Gelberg, & Breakey, 1999). As a result, homeless adults commonly exhibit healthcare needs characteristic of individuals who

are decades older (Gelberg, Linn, Mayer-Oakes, 1990) and mortality rates that far exceed those of the general population (Hwang et al., 1997; O'Connell, 2005).

Coupled with high levels of healthcare need are high levels of unmet need. Homeless adults regularly do not receive necessary treatment for the multitude of physical and mental health conditions described above. In a nationally representative sample of 966 homeless adults, 74% of participants reported an unmet healthcare need in the past year, and 49% reported two more or more unmet needs during that period (Baggett, O'Connell, Singer, & Rigotti, 2010). Likewise, in another geographically diverse study of homeless adults, 44% of over 7,000 participants endorsed having an unmet healthcare need in the past year (Desai & Rosenheck, 2005). These unmet needs are diverse and appear across different domains of healthcare, including general and specialty medical care, mental health care, prescription medications, and dental care (Baggett et al., 2010; Kertesz et al., 2013).

Levels of unmet need appear to be increasing and underestimated. A study conducted in Birmingham, Alabama found that the percentage of homeless adults reporting unmet needs increased from 32% in 1995 to 54% in 2005 (Kertesz, Hwang, Irwin, Ritchey, & LaGory, 2009). This sharp incline did not coincide with changes in homeless population size or available safety-net funding. Additionally, the traditional method of measuring unmet healthcare need seems to be misguided. Studies typically assess unmet need across an entire sample, not just the portion endorsing a health problem. The result is that the denominator used to calculate the percentage endorsing an unmet need is inflated, and rates of unmet need are inaccurately minimized (Kertesz et al., 2013).

When it comes to healthcare, those most in need are most underserved. This paradox involves many factors, and a comprehensive solution necessitates a multidisciplinary approach. While health psychologists stand to contribute in numerous ways, our field is uniquely suited to approach healthcare utilization from a behavioral perspective.

Healthcare Use as a Health Behavior

Health service utilization has been conceptualized as one of many health behaviors (Conner & Norman, 1998), the broad set of actions that positively contribute to health and well-being (Gochman, 1997). Healthcare use behavior includes any effort to use health services for the purpose of preventing, detecting, or treating a mental or physical condition, either acute or chronic. This may involve attempts to employ preventive, ambulatory, or urgent care provided by either a mental or medical health generalist or specialist.

Healthcare utilization behavior is complex and multifaceted. Similar to other health behaviors, healthcare utilization involves a motivational phase in which intentions are formed, followed by an action phase, in which a particular behavior is executed (Schwarzer & Fuchs, 1995). The motivation stage involves interpretation of symptoms and condition severity or a judgment about illness susceptibility and prospective risk (Scott & Walter, 2010). This stage also includes decision-making, a process influenced by knowledge of the medical system, expectations of treatment, and perceptions of obstacles to care. Further, the action stage is affected by motivation, communication abilities, and planning skills (Cornally & McCarthy, 2011).

While the complexity of healthcare utilization behavior is important to recognize, research in the homeless population has emphasized the relationship between levels of unsatisfied healthcare need and a towering set of healthcare barriers. Indeed, the link is so well established that unmet need is commonly viewed as an index of barriers to access (Allin & Masseria, 2009). Barriers vary but can be broadly categorized as stemming from (1) logistical issues associated with homeless life, (2) individual health impairments, and (3) healthcare setting-specific obstacles.

Severe poverty is a defining characteristic of the homeless population (Shinn, 2010), and the effects of insufficient resources negatively impact healthcare utilization. Competing needs, such as shelter, food, clothing, and childcare, interfere with the health care process (Gallagher, Andersen, Koegel, & Gelberg, 1997; Gelberg, Gallagher, Andersen, & Koegel, 1997). Lack of transportation to appointments is another major obstacle (Gelberg, Browner, Lejano, & Arangua, 2004; Wojtusik & White, 1998). Financial difficulties (Hwang, 2001) and lack of insurance coverage (Krieder & Nicholson, 1997) are also frequently cited as barriers.

In addition to setting the stage for unmet need, health impairments also directly affect healthcare access. Limited mobility and daily functioning due to physical health problems are associated with greater difficulty obtaining care in low-income populations (Jacob, Arnold, Hunleth, Greiner, & James, 2014), and greater medical comorbidity is related to experiencing more severe barriers to care in homeless patients (Kushel, Vittinghoff, & Haas, 2001). Mental health problems also impede access. Studies have shown that homeless adults with mental health impairments have higher levels of reported unmet healthcare need (Desai &

Rosenheck, 2005; Gelberg & Linn, 1988; Kertesz et al., 2009). In a study of nearly 2,000 homeless adults, a diagnosis of psychosis was associated with difficulties understanding how to maneuver within the healthcare system (Rosenheck & Lam, 1997).

Lastly, there are numerous elements of the healthcare system itself that act as barriers to care. The healthcare system is large and confusing, and like much of the U.S. population, many homeless adults struggle to navigate it effectively (Damrosch & Strasser, 1998; Health Care for the Homeless Network, 2013; Shaw, Asomugha, Conway, & Rein, 2014). Homeless adults also report that excessive wait times and experiencing the health care system as a "hassle" restrict access (Applewhite, 1997; Rosenheck & Lam, 1997). Furthermore, homeless adults regularly feel discriminated against and disrespected in healthcare settings (Wen, Hudak, Hwang, 2007). Studies have found that feeling stigmatized is a major impediment to care (Bhui et al., 2006; Kim et al., 2007). Lastly, results have shown that homeless adults often feel distrustful of healthcare workers (Plackett & Scott, 2005; Snaajder-Murray & Slesnick, 2011), and that this distrust negatively impacts the healthcare process (Padgett, Struening, Andrews, & Pittman, 1995).

Healthcare utilization is a challenging health behavior. The task of utilizing healthcare is complicated, and for homeless adults, fraught with obstacles. As with any complex behavior that requires one to overcome adversity, there are difficulties involved with initiation and perseverance. For this reason, theory and research related to self-efficacy, the belief in one's ability to execute a given behavior, are highly relevant to understanding the healthcare use of homeless adults.

The Role of Self-Efficacy in Health Behavior

Psychological science has established that self-efficacy is a critical factor in predicting a behavior that is difficult to initiate and maintain (Bandura, 1986). This section starts with an overview of self-efficacy theory in general, followed by a description of how that theory applies specifically to health behaviors. Next, we move to the research borne out of that theory. That discussion begins with an examination of how self-efficacy relates to health behaviors as a whole before transitioning to a more focused review of the preliminary evidence concerning self-efficacy and healthcare usage.

Self-efficacy theory

Confidence in one's ability to carry out a particular action influences behavior initiation as well as capacity to persist when faced with challenges (Bandura, 1977). The role of self-efficacy has been demonstrated across a large set of behaviors. Meta-analyses have found that self-efficacy beliefs predict behavior in athletic performance (Moritz, Feltz, Fahrbach, & Mack, 2000), academic functioning (Multon, Brown, & Lent, 1991), work-related practices (Stajovic & Luthans, 1998), and health functioning (Holden, 1991).

Self-efficacy appraisals are domain relevant and task specific (Bandura, 1982, 2006). Because an individual's self-efficacy can (and typically does) differ considerably by context, generalized self-efficacy, or a global sense of competence to manage nonspecific challenges, is by definition not highly pertinent to a particular behavior. To this point, research has shown that global self-efficacy is only

minimally useful in the way of predicting or explaining behavioral outcomes (Moritz et al., 2000; Pajares, 1996).

Additional support of the domain specificity of self-efficacy comes from a study by Hofstetter and colleagues (1990). Diet self-efficacy, exercise self-efficacy, medical care self-efficacy, and political self-efficacy as well as a set of related behaviors were assessed in a sample of 525 adults. Factor analysis of the entire set of self-efficacy items revealed that the items loaded onto separate, orthogonal factors. In other words, items for each self-efficacy type were most strongly related to a distinct factor as opposed to one general factor. Those specific self-efficacy factors were also most strongly associated with related behaviors. For example, aerobic exercise frequency was related to exercise self-efficacy, and ice cream consumption frequency was related to diet self-efficacy.

As a psychological concept, general self-efficacy contributes little to our understanding of behaviors. However, general self-efficacy does help in organizing the ever-growing thicket of self-efficacy constructs by providing a conceptual boundary – no version of self-efficacy can be more broadly defined than general self-efficacy.

As such, the scope of a particular type of self-efficacy could theoretically be evaluated by the degree to which it correlates with general self-efficacy. Narrowly defined self-efficacy constructs should demonstrate small-sized correlations with general self-efficacy, whereas more broadly defined self-efficacy constructs should demonstrate moderately sized correlations with general self-efficacy. The appropriate scope of a particular self-efficacy construct is largely determined by the projected

function of that construct. For instance, depending on the intended use, one could conceivably develop a series of overlapping self-efficacy scales that differ in scope and thus their association with general self-efficacy. As a hypothetical illustration, consider a cooking self-efficacy scale, a breakfast-making self-efficacy scale, and a pancake self-efficacy scale. As the scope decreases across constructs, so should the correlation with general self-efficacy.

With regard to health-focused self-efficacy constructs, this is precisely the pattern we find in the literature. The relation of general self-efficacy to different health self-efficacy beliefs varies as a function of how narrowly that particular type of health self-efficacy is defined. General self-efficacy has demonstrated no association or weak associations (i.e., .1) with tightly delineated self-efficacy constructs focused on a particular condition, such as asthma-management self-efficacy (van der Palen, Klein, & Seydel, 1997) and rheumatoid arthritis management self-efficacy (Hewlett et al., 2001). Additionally, general self-efficacy has demonstrated moderate correlations (i.e., .54–.59) with broader health self-efficacy constructs, such as chronic illness self-efficacy (Freund, Gensichen, Goetz, Szecsenyi, & Mahler, 2013), pain self-efficacy (Börsbo, Liedberg, Wallin, & Gerdle, 2012), and self-care self-efficacy (Hricová & Janečková, 2015).

Self-efficacy also plays a central role in numerous theories of health behavior. Although theories differ by the constructs involved and the proposed pathways by which those constructs affect behavior, the fundamental idea behind self-efficacy remains the same: individuals with higher self-efficacy set larger goals, are more optimistic about outcomes, and are less deterred by obstacles (Bandura, 1997). Self-

efficacy is the pivotal factor in Bandura's Social Cognitive Theory of health behavior (Bandura, 2004; see Figure 1). This theory holds that self-efficacy, along with health-related knowledge and goals, perceptions of facilitators and barriers, and beliefs regarding outcome expectancies determine health behavior. Self-efficacy is also a key factor in the Health Belief Model (Becker & Rosenstock, 1987), which in its extended form includes perceptions of illness susceptibility and severity, beliefs about health behavior benefits and obstacles, cues to action (e.g., media reports, advice from friends and doctors), social support, health values, and locus of control perspectives (Aalto & Uutela, 1997; Gillibrand & Stevenson, 2006; see Figure 2).

Health locus of control, a domain-specific version of the omnibus locus of control concept (Rotter, 1966), refers to beliefs regarding the degree that health can be affected by personal actions and by external forces, such as chance or other people (Wallston et al., 1978). Although research has shown that health locus of control may interact with self-efficacy to influence behavior (Christensen, Wiebe, Benotsch, & Lawton, 1996; Holt, Clark, Kreuter, & Scharff, 2000; O'Hea et al., 2009), these two sets of beliefs are theoretically distinct (Bandura, 2006). For example, a person with diabetes with a strong internal locus of control may believe that blood-glucose levels are entirely determined by personal actions, such as healthy eating, regular glucose level testing, and insulin regimen adherence. However, this same person may simultaneously exhibit low diabetes self-efficacy because he or she lacks confidence in his or her ability to carry out those actions.

Health value represents the extent to which people appreciate their health. Studies have demonstrated a small correlation between health values and health-

specific self-efficacy (e.g., Jackson, Tucker, & Herman, 2007; Petrovic, Burney, & Fletcher, 2011), whereas other studies have found no such relationship (e.g., Aalto & Uutela, 1997; Waldrop, Lightsey, Ethington, Woemmel, & Coke, 2001). Moreover, health value has been shown to account for unique variance in health outcomes while controlling for self-efficacy (Jackson et al., 2007; Weitzel, 1989). Health value has also been shown to interact with self-efficacy in explaining health behavior (Lau, Hartman, & Ware, 1986; Norman, 1995). Although health value may be an important attitude in understanding certain health behaviors, it operates as a separate belief from self-efficacy. Take for example the same individual with diabetes mentioned above. That person may prize health and consider health a vitally important aspect of life, while at the same time believe that he or she is incapable of carrying out actions required to protect or improve health.

Self-efficacy also plays a role in numerous other major theories of health behavior, such as the Theory of Planned Behavior (Ajzen, 1991), Protection Motivation Theory (Maddux & Rogers, 1983), and the Transtheoretical Model of Health Behavior Change (Prochaska & Velicer, 1997). That self-efficacy has become so ubiquitous in health behavior theory is further proof of how essential this cognitive factor is to understanding health behaviors (Schwarzer & Fuchs, 1995).

Self-efficacy research

Consistent with the theory described above, research has demonstrated a significant relationship between self-efficacy and health behavior. This research has been conducted across a range of patient and non-patient populations in the United States and abroad. In a large-scale meta-analysis of over 50 studies examining

smoking cessation, dental care, weight management, and other health behaviors, self-efficacy was found to have a moderate effect size in the prediction of behavioral outcomes (Holden, 1991).

Furthermore, the relationship between self-efficacy and health behavior persists while controlling for other relevant cognitive factors, such as health-related knowledge, beliefs, and attitudes. For example, cancer prevention self-efficacy was a significant predictor of breast cancer detection behaviors (e.g., breast self-examination) above and beyond the effects of perceived cancer susceptibility (Seydel, Taal, & Weigman, 1990). Diabetes care self-efficacy was found to account for significant variance in diabetes self-care (i.e., blood glucose testing, medication adherence, diet management) while controlling for beliefs concerning barriers to care (Aljasem, Peyrot, Wissow, & Rubin, 2001). Lastly, results from a study of alcohol use behaviors in African-American, male adolescents demonstrated that condom use self-efficacy was a far stronger predictor of safe sex behavior than AIDS knowledge (Colón, Wiatrek, & Evans, 2000).

In addition to the condition-specific varieties of self-efficacy discussed above, a growing collection of evidence has highlighted the importance of patient-physician communication self-efficacy. Effective communication with medical staff is strongly related to healthcare satisfaction and health outcomes (Stewart, 1995). Studies across multiple patient groups have shown that *confidence* in one's ability to effectively interact with physicians predicts better healthcare utilization and better health outcomes. For instance, in a study of men with prostate cancer, patient-physician interaction self-efficacy predicted higher quality of life (Heckman et al., 2011). In

another study involving older adults, physician communication self-efficacy was positively associated with patient satisfaction and self-reported health status (Maly, Frank, Marshall, DiMatteo, & Reuben, 1998).

Although limited, several studies have investigated healthcare use self-efficacy. Similar to other work, results demonstrate that higher self-efficacy is related to better healthcare use. In a study examining the link between alcohol use and preventive health services, those with stronger beliefs in their capability to access and utilize health services more frequently engaged in prostate cancer exams and cholesterol screenings (Green et al., 2010). Healthcare self-efficacy was also found to predict dental service use in a sample of undergraduates (Grey, Lobel, & Cannella, 2013). Finally, a study examining factors that affect healthcare in autistic adults found that compared to non-autistic controls, autistic adults reported significantly lower healthcare use self-efficacy and a significantly greater number of unmet healthcare needs (Nicholaidis et al., 2012).

It is worth highlighting that all of the studies mentioned directly above regarding healthcare use self-efficacy include a focus on non-urgent ambulatory care. Utilization of non-urgent, ambulatory care services requires complex motivation, decision-making, planning, and interpretation of risk or symptoms and often involves multiple obstacles, such as cost and transportation (Kangovi et al., 2013; Rust et al., 2008; Vieth & Rhodes, 2007). The challenges associated with non-urgent, ambulatory care are made even clearer when compared to the process of using emergency department services. Emergency departments are open 24-hours per day and do not require scheduling. Transport by ambulance is usually available when

needed, and hospitals participating in Medicare (close to 98% of all U.S. hospitals) are mandated by law to provide treatment to individuals until they are medically stabilized, regardless of ability to pay (Zibulewsky, 2001). Due to the unique set of difficulties involved in utilizing non-urgent ambulatory services, the role of self-efficacy has garnered special interest. While it is encouraging to see research on healthcare self-efficacy, conclusions from these studies are limited by the fact that validated assessment measures of healthcare use self-efficacy were not employed.

Assessment of self-efficacy in health behaviors

A vital facet of any psychological research endeavor is the use of validated assessment measures (Kazdin, 2003). Recognition of the role of self-efficacy in health behavior has prompted the development of a large collection of assessment tools. This collection includes measures of self-efficacy specific to smoking cessation (Etter, Bergman, Humair, & Perneger, 2000), physical exercise (Resnick & Jenkins, 2000), diet maintenance (Burke, Dunbar-Jacob, Sereika, & Ewart, 2003), diabetes management (van der Bijl, van Poelgeest-Eeltink, & Shortridge-Baggett, 1999), and condom use (Brafford & Beck, 1991), among others. The psychometric properties of these measures have been examined in order to establish adequate reliability and validity. In other words, research has determined that those assessment tools actually measure the constructs they claim to measure and do so in a consistent manner. Without this psychometric data, conclusions based on those assessment tools would be questionable.

Until very recently, a validated measure of healthcare self-efficacy had not been created. Moore and colleagues (2015) have developed a measure of mental

healthcare seeking (Self-Efficacy to Seek Mental Health Care scale; SE-SMHC). In a sample of 977 South Africans, the SE-SMCH was shown to have good internal consistency as indicated by Cronbach's alphas of .87–93 for total and subscale scores. The only preliminary evidence of construct validity were findings that SE-SMCH scores discriminated between participants by their response when asked if they had "sought help from relatives or other trusted people" or "sought care from healthcare staff" in response to feeling "emotionally troubled." A second healthcare self-efficacy questionnaire, the Preventive Services Use Self-Efficacy (PRESS), comes from Jacob and colleagues (2016). Psychometric properties were evaluated in a sample of older (mean age was 72), predominately white women. Cronbach alpha's for the five subscales ranged from .81–.94, and construct validity was evidenced by associations between PRESS scores and related behaviors. For example, participants who reported getting flu shots had higher vaccination self-efficacy scores.

Most studies examining healthcare self-efficacy have fashioned ad-hoc scales by adapting items from other measures (e.g., Milam et al., 2015; Nicolaidis et al. 2012) or by drafting entirely new questions (e.g., Green et al., 2010; Grey et al., 2013; Johnston, Huebner, Tyll, Barlow, & Thompson, 2004; Kelly et al., 2014). Other studies have used the broader construct of health self-efficacy as a substitute for healthcare use self-efficacy during investigations of healthcare use behaviors (e.g., Kannan & Veazie, 2014; Richards, Tucker, Brozyna, Ferdinand, & Shapiro, 2009). This research highlights the relevance of healthcare self-efficacy, and findings may provide preliminary evidence of its significance. However, what this research most

clearly demonstrates is the need for a systematically developed and validated measure of healthcare use self-efficacy.

Conclusion and Clinical Implications

The health of homeless adults is poor, and rates of unmet healthcare need in this population are staggering. Health service use is a complex task for anyone, and barriers to care exacerbate the difficulty associated with this health behavior in homeless adults. Research has established the importance of self-efficacy in health behaviors generally, and there is preliminary evidence that this cognitive factor plays a role in healthcare use behavior specifically. However, the field currently lacks a psychometrically sound measure of healthcare use self-efficacy.

In addition to expanding our theoretical understanding of healthcare use behavior in homeless adults, research in this area stands to inform intervention development. Self-efficacy has been shown to be modifiable across numerous health behaviors, and enhanced self-efficacy beliefs are related to improvements in health and healthcare utilization outcomes (Lorig et al., 2001; Marks, Allegrante, & Lorig, 2005). Empowering homeless adults by helping to increase healthcare use self-efficacy may reduce levels of unmet need and improve health outcomes. Moreover, this type of individual-level intervention could serve as an adjunct component to other system-level work already taking place, such as efforts to change policy and health care structure.

Present Study

The primary aim of this study was to develop and validate the Healthcare Use Self-Efficacy List (HUSEL), a measure of healthcare use self-efficacy for use in the

adult homeless population. A validated measure of healthcare use self-efficacy has not previously existed. Measure development was informed by both quantitative and qualitative data so that items accurately reflect the healthcare experiences of homeless adults. In addition, psychometric properties were evaluated in order to establish that the new assessment tool meaningfully and consistently measures the construct of healthcare use self-efficacy. Specifically, face validity, convergent validity, divergent validity, criterion validity, and incremental validity were assessed. Internal reliability and test-retest reliability were also examined.

The secondary aim of this study was to investigate the relationships between healthcare use self-efficacy, unmet health care need, and current health status. Little is known about the cognitive factors that affect healthcare use in homeless adults. Findings regarding self-efficacy may extend our theoretical conceptualization of healthcare use behaviors and inform future intervention development in this population.

Aims and Hypotheses

Aim 1. The first aim was to examine the HUSEL's validity and reliability.

Hypothesis 1a: Face validity. It was hypothesized that the HUSEL would demonstrate face validity. In other words, participants were expected to experience the measure as transparent and view the items as related to the construct of healthcare use self-efficacy.

Hypothesis 1b: Convergent and divergent validity. It was hypothesized that the HUSEL would demonstrate convergent and divergent validity. Specifically, the HUSEL was expected to be associated with other measures

related to healthcare use self-efficacy – general self-efficacy and health self-efficacy. The HUSEL was expected to not be associated with measures unrelated to healthcare use self-efficacy – health value and health locus of control. In addition, the HUSEL was expected to be inversely related to depressive symptoms.

Hypothesis 1c: Criterion validity. It was hypothesized that healthcare use self-efficacy would be positively associated with number of non-urgent, ambulatory care visits in the past year.

Hypothesis 1d: Incremental validity. It was hypothesized that healthcare use self-efficacy would be associated with number of non-urgent ambulatory care visits while controlling for health practices self-efficacy.

Hypothesis 1e: Internal consistency. It was hypothesized that the HUSEL would demonstrate internal consistency. The items were expected to be related to one another.

Hypothesis 1f: Temporal reliability. It was hypothesized that the measure would demonstrate test-retest reliability. HUSEL scores were expected to be related across multiple time-points.

Aim 2. The second aim was to investigate the relation between healthcare use self-efficacy, unmet health care need, and perceived health status.

Hypothesis 2a: HUSEL relation to unmet need. It was hypothesized that healthcare use self-efficacy would be inversely related to level of unmet health care need.

Hypothesis 2b: HUSEL relation to health status. It was hypothesized that healthcare use self-efficacy would be related to subjective physical and mental health status.

Methods

Participants

This study involved a total sample of 151 homeless adults (10 qualitative interview participants, 10 pilot-test participants, 131 validation phase participants). Eligible participants were age 18 or older, spoke fluent English, experienced homelessness in the past year, and reported at least one healthcare need in the past year. Individuals were determined to be homeless if they experienced any form of unstable housing, such as being "doubled up" (i.e., living as a guest at a friend's or family member's home because other housing is unavailable), living in a shelter, or living in places not intended for habitation (e.g., street, park, empty building).

In addition, this study involved a sample of seven case managers who assist homeless adults in utilizing healthcare services. Case managers participated in focus groups and did not respond to any questionnaires.

Measures

Demographics. A self-report questionnaire assessed demographic variables including, age, gender, race/ethnicity, education history, housing status, employment status, and health insurance status. Participants were also asked whether they were enrolled in case management services.

Healthcare use self-efficacy. The Healthcare Use Self-Efficacy List (HUSEL) is a 15-item self-report questionnaire that assesses healthcare use self-

efficacy. This measure is the final product of the present study, and its psychometric properties are discussed in detail below. Participants rated current confidence level regarding their ability to complete tasks and manage challenges related to healthcare utilization. Responses are provided on an eleven-point Likert scale ranging from 0 (*zero confidence, cannot do at all*) to 100 (*full confidence, highly certain can do*). Higher scores represent stronger efficacy beliefs.

Generalized self-efficacy. The General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995) is a ten-item self-report measure that assesses general self-efficacy regarding ability to cope with nondescript difficulties. Participants rate their level of agreement with statements on a four-point Likert scale ranging from 1 (*Not at all true*) to 4 (*Exactly true*). Example items include, "I can usually handle whatever comes my way," and "I am confident that I could deal efficiently with unexpected events." Higher scores indicate stronger efficacy appraisals. The GSE has been used in a wide range of research studies in the United States and abroad (Scholz, Doña, Sud, & Schwarzer, 2002). Studies have found that the GSE demonstrates adequate divergent and convergent validity when compared with measures of anxiety and optimism, respectively. Studies have also demonstrated that the GSE has good internal consistency and test-retest reliability (Schwarzer & Jerusalem, 1995). In this study, Cronbach's alpha was .91.

Health self-efficacy. The Self-Rated Abilities for Health Practices Scale (SRAHP; Becker, Stuifbergen, Oh, & Hall, 1993) is a 28-item self-report measure that assesses efficacy beliefs regarding nutrition, exercise, psychological well-being, and health practices. Participants rate their level of agreement with efficacy

statements about health-related activities such as, “Eat a balanced diet” (Nutrition subscale) and “Do exercises that are good for me” (Exercise subscale). Ratings are provided on a five-point Likert scale ranging from 0 (*Not at all*) to 4 (*Completely*). Higher scores correspond to higher efficacy appraisals. This measure has demonstrated good internal consistency, test-retest reliability, and construct validity (Becker et al., 1993). The current study utilized the SRAHP Total score (Cronbach’s alpha = .94) and the SRAHP-Health Practices subscale score (Cronbach’s alpha = .89). Examples of items included on the seven-item Health Practices subscale are, “Watch for negative changes in my body’s condition”, “Recognize what symptoms should be reported to a doctor or nurse” and “Get help from others when I need it.”

Health values. The Health Value Scale (HVS; Lau et al., 1986) is a four item self-report measure of the degree to which one values health. Participants rate their level of agreement with statements on a seven-point Likert scale ranging from 1 (*Strongly agree*) to 7 (*Strongly disagree*). Example items include, “There are few things more important than good health,” and “There are many things I care more about than my health.” Two items are reverse-scored, and higher scores indicate a higher value on health. The measure has been found to have good psychometric properties across a variety of populations (Lau et al., 1986). Cronbach’s alpha in this sample was .42, which is typically interpreted as indicating poor internal consistency.

Health locus of control. The Multidimensional Health Locus of Control Scales (MHLC; Wallston, Wallston, & DeVellis, 1978) consists of three, six-item scales that measure personal control beliefs related to health. Scales assess control beliefs regarding internal locus of control (e.g., “I am in control of my health,”),

external locus of control concerning powerful others (e.g., "Health professionals control my health,"), and external locus of control concerning chance (e.g., "My good health is largely a matter of fortune). Participants rate their level of agreement with statements on a six-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). This measure has been shown to have adequate internal consistently, test-retest reliability, and construct validity across many different studies (Wallston, 2005). In our sample, Cronbach's alphas for the MHLC Internality scale, MHCL Externality-Powerful Others scale, and MHCL Externality-Chance scale were .70, .63, and .74, respectively.

Perceived health status. The 12-Item Short-Form (SF-12; Ware, Konsinski, & Keller, 1996) is a self-report measure of subjective physical and mental health status. This measure consists of the SF-12-Physical Component Summary and the SF-12-Mental Component Summary. Psychometric evaluations have found that this measure demonstrates good reliability and construct validity across of range of samples (Gandi et al., 2001; Müller-Nordhorn, Roll, & Willich, 2004), including patients with severe mental illness (Salyers, Bosworth, Swanson, Lamb-Pagone, & Osher, 2000) and individuals experiencing homelessness (Larson, 2002). This measure was selected due to its brevity in an effort to reduce participant burden. In this study, Cronbach's alphas for both SF-12 scales were .84.

Depressive symptoms. The Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) is a self-report measure that assesses depression, anxiety, and stress on three seven-item scales. Participants rate the degree to which statements applied to them over the past week using a 4-point Likert scale (0 = *did*

not apply to me; 3 = *applied to me very much or most of the time*). Studies have found that the DASS-21 has good construct validity and reliability in both clinical and nonclinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005; Norton, 2007). Specifically, findings have shown that the DASS-21 scales have good factor stability, high internal consistency, and strong divergent and convergent validity. This study utilized the DASS-Depression scale, which had a Cronbach's alpha of .90.

Unmet healthcare need. Unmet healthcare need in the past year was assessed by "yes/no" questions inquiring about need across five different varieties of healthcare service (i.e. medical/surgical, mental health, prescriptions, dental, and vision). Items were based on the healthcare utilization questionnaire administered as part of the CDC's 2012 National Health Interview Survey (Blackwell, Lucas, & Clark, 2014). Following recommendations by Kertesz et al. (2013), participants were first asked whether they have experienced a healthcare need (e.g., "In the past year, was there a time when you needed medical or surgical care?"). Participants were then asked whether they have been unable to fulfill a healthcare need (e.g., "In the past year, was there a time when you needed medical or surgical care but could not get it?"). Participants who responded affirmatively to both questions were determined to have an unmet need. An overall unmet need score was calculated as the sum of unmet needs across the five categories. This unmet needs assessment method is commonly used in studies assessing healthcare and is viewed as standard format in the field (Cunningham & Hadley, 2007).

Healthcare use rates. Participants were asked to report number of visits in the past year for a variety of healthcare services, including emergency department, mental health care provider (psychiatrist, psychologist, therapist, etc.), non-urgent health care, and surgery. Questions were open-ended and required participants to enter a number into a blank space (e.g., "In the past year, how many times did you see a health care provider for a non-urgent need – i.e., not in the ER?). Research comparing self-reported healthcare use with medical records has found that homeless adults are accurate reporters for a 12-month recall period (Hwang, Chambers, & Katic, 2016).

Procedures

This study took place in two phases – a development phase and a validation phase (see Figure 2). The aim of the development phase was measurement construction, whereas the aim of the validation phase was examination of the HUSEL's reliability, construct validity, and associations with unmet healthcare need and subjective health status. Approval from the UMSL and Places for People internal review boards (IRBs) was obtained prior to beginning this study.

Participants were recruited from a community mental health clinic located in Midtown St. Louis. Case managers at this clinic invited eligible individuals to participate. Interested individuals were referred to the principal investigator for informed consent, and if they chose, study participation. Participants were provided ten dollars in financial compensation for their time and effort. A sample of case managers was also recruited to participate in focus groups. Case managers were not provided financial compensation for participation.

Development phase. An initial pool of Healthcare Use Self-Efficacy List items was developed from three sources. The principal investigator created items based on the theory and research described above. Item content was also gathered from individual semi-structured interviews with homeless adults ($N = 10$) as well as two focus groups involving case managers that assist homeless adults in obtaining healthcare services ($N = 7$). Interview schedules were used to guide the qualitative interviews and focus groups (see Appendix A). Prior to beginning the qualitative interviews, participants verbally provided demographic information (i.e., age, gender, race/ethnicity). Prior to beginning the focus groups, case managers completed a demographic questionnaire regarding age, gender, race/ethnicity, and years of work experience. The qualitative interviews were audio recorded, and detailed notes were taken by the principal investigator during the focus groups.

Item structure was informed by Bandura's (2006) *Guide for Constructing Self-Efficacy Scales*, which provides specifications regarding item wording and response scale design. Feedback from two other health psychology researchers was used to revise items. The item pool was pilot-tested on a small sample of homeless adults ($N = 10$). Pilot participants responded to the items as well as open-ended questions regarding perceptions of face validity, readability, and interpretation. Feedback from the pilot sample prompted additional item revisions.

The intention was to create a broad, comprehensive initial item pool that accounted for the full scope of the target construct. At this step, the philosophy was over-inclusiveness. Later analyses would speak to which items to cut but would be inescapably silent regarding items left out from the very beginning (Clark & Watson,

1995). Item selection was based on findings from quantitative and qualitative analyses as well as the overarching goal to build a product that was concise and time-efficient.

While there are no strict guidelines concerning the number of items to include in a questionnaire, shorter measures are generally viewed as easier to administer than longer measures (Hinkin, 1998). Studies have shown that questionnaire length affects response rates (Kalantar & Talley, 1999; Rolstad, Adler, & Rydén, 2011) and response quality (Galesic & Bosnjak, 2009; Herzog & Bachman, 1981). It is also likely that clinical staff are more apt to select briefer measures given time constraints and competing priorities, although this assumption has not been evaluated. In an effort to limit participant burden and maximize clinical utility, the item selection process aimed to reduce the initial pool to a final pool of between 10 and 25 items.

Validation phase. The Healthcare Use Self-Efficacy List (HUSEL) initial item set was then administered to a sample of homeless adults ($N = 131$). Participants also completed additional measures, with total participation time lasting roughly 45 minutes. Participants were asked to return one to three weeks later in order to respond to the HUSEL items a second time. As self-efficacy beliefs may shift in response to new experiences and influences, it was important that the period of time between test-retest administrations was relatively brief (Frei, Svarin, Steurer-Stey, & Puhan, 2009).

Data Analysis

Preliminary analyses. Statistical Package for the Social Sciences, version 22 was used to conduct quantitative analyses (IBM Corp., 2013). The data set was

examined for missing data and outliers. Analytic assumptions for linear regression analysis (e.g., normality, homoscedasticity, linearity, multicollinearity) and logistic analysis (e.g., independent variable specification, multicollinearity) were checked. Descriptive analyses were conducted for demographic and study variables.

Power analyses. G*Power was used to conduct power analyses (Faul, Erdfelder, Buchner, & Lang, 2009). Power analyses were conducted with an alpha of $p < .05$ and power of 80% ($1 - \beta$). Hypotheses 1b and 1d involve bivariate correlations, and analyses indicated that 82 participants are required to detect a medium effect size ($r = .3$). Hypothesis 2a involves multiple linear regression equations with up to seven independent variables, and analyses indicated that 103 participants are required to detect a small-medium effect size ($f^2 = .15$). Hypothesis 2a also involves multiple logistic regression equations with six independent variables. With independent variables predicted to correlate moderately, and the probability of the target event predicted to be .50, analyses indicated that logistic regressions required 113 participants to detect a small-moderate effect size. However, the literature is undecided regarding sample size requirements for logistic regression (Peng, So, Stage, & St. John, 2002). A number of statisticians have recommended a minimum ratio of ten participants to every predictor, with a total sample size of no less than 100 (Peng, Lee, & Ingersoll, 2002). Hypothesis 2b involves a multiple linear regression equation with four independent variables, and analyses indicated that 85 participants are required to detect a medium effect size ($f^2 = .15$).

Measure development. A series of qualitative and quantitative analyses were used to inform item construction and guide item selection.

Qualitative data analysis. Qualitative data collected through semi-structured interviews with homeless adults and focus groups with case managers were examined using an interpretative phenomenological analysis approach (IPA). IPA is a systematic process in which participants' responses are reviewed multiple times in order to examine themes and higher-order theme categories (Smith, 1996; Wilkinson, 1998). This method allowed for detailed and structured examination of participants' experiences and the meaning assigned to those experiences.

Item selection. Items that were reported by pilot participants to be confusing, ambiguous, or irrelevant were reworded or discarded. Item skew and kurtosis were examined, and items with skew and kurtosis values beyond the predetermined cut-off criterion were discarded. Item-total correlations and inter-item correlations were examined. Items that did not sufficiently correlate with the total score were discarded. Items with inter-item correlations below or above the predetermined cut-off criteria were discarded. Item content was reviewed again, and items with redundant content were discarded prior to conducting a series of exploratory factor analyses in order to determine which items to retain in the final item pool.

Hypothesis testing. Hypotheses were investigated using HUSEL scores calculated from the final item pool.

Hypothesis 1a: Face validity. Subjective perceptions of the relevance and meaning of HUSEL items collected during pilot testing were used to evaluate face validity.

Hypothesis 1b: Convergent and divergent validity. To assess convergent and divergent validity, Pearson product-moment correlations (*r*) were calculated between

HUSEL total score and other relevant measures. Specifically, convergent validity was assessed by examining associations between the HUSEL and the Generalized Self-Efficacy scale and Self-Rated Abilities for Health Practices scale. Divergent validity was assessed by examining associations between the HUSEL and the Health Values Scale, the Multidimensional Health Locus of Control scales, and the Depression Anxiety Stress Scales-Depression subscale.

Hypothesis 1c: Criterion validity. A linear regression analysis was conducted to investigate the relationship between HUSEL Total score and number of non-urgent, ambulatory care visits in the past year. Number of ambulatory care visits was entered as the dependent variable. Factors related to ambulatory care were entered at Step 1, including age, gender, insurance status, and case management enrollment. HUSEL Total score was entered at Step 2.

Hypothesis 1d: Incremental validity. A linear regression analysis was conducted to investigate the relationship between HUSEL Total score and number of non-urgent, ambulatory care visits in the past year while controlling for health practices self-efficacy. Number of ambulatory care visits was entered as the dependent variable. SRAHP – Health Practices score was entered as an independent variable at Step 1. HUSEL Total score was entered as an independent variable at Step 2.

Hypothesis 1e: Internal consistency. Internal consistency was assessed by reviewing Cronbach's alpha for the HUSEL and HUSEL subscales.

Hypothesis 1f: Temporal reliability. Test-retest reliability was assessed by calculating a Pearson product-moment correlation between initial and follow-up scores on the HUSEL Total score.

Hypothesis 2a. The relation between healthcare use self-efficacy and unmet healthcare need was examined by conducting hierarchical regression analyses in which unmet healthcare need was entered as the dependent variable. Factors related to unmet need were entered as independent variables at Step 1, including, age, gender, health status, insurance status, and case management enrollment. HUSEL Total score was entered at Step 2.

Hypothesis 2b. The relation of health care use self-efficacy and perceived health status was examined using hierarchical regression analyses in which perceived health status was entered as the dependent variable. Factors related to perceived health status were entered as independent variables in Step 1, including age, gender, insurance status, and case management enrollment. HUSEL Total score was entered at Step 2.

Results

Qualitative Interviews

Ten adults who were either currently homeless or had experienced homelessness in the past year participated in semi-structured interviews (see Appendix A for interview schedule). Interviews centered on the research question: What are the healthcare difficulties that homeless adults face and how do they experience those challenges? Participants' ages ranged from 26 to 62 years (M = 42.9, SD = 12.1). Seven participants were African-American, and three were

Caucasian. Seven participants were female, and three were male. Mean interview length was 68.5 minutes (*SD* = 11.9, range: 50–91).

In an iterative process, recordings were auditorily reviewed three times in order to identify themes and organize them into superordinate and subordinate categories. This process was exploratory, and the aim was understand participants' personal perceptions of healthcare utilization (Smith, 1996). In general, participants described healthcare utilization as a stressful and often demoralizing process. Three superordinate themes emerged across the ten interviews: problems due to logistical barriers, difficulties related to interactions with health professionals, and challenges associated with physical and emotional distress.

Logistical barriers were the most commonly discussed topic. All ten participants emphasized the significance of problems associated with lack of transportation ("If you can't get there, then that's that. End of story." [Participant 007]). Insufficient finances were cited as a barrier by nearly the entire sample in terms of not only access to services but quality as well. Participant 003 explained:

> "I know lots of different types of people and people with money too. And healthcare…well, healthcare depends on what you got in your pocket. People who go to these clinics over here, they can't afford good doctors, and after you get done sitting around all day…we receive the bare minimum care."

As touched on in the above quote, long wait-times were another commonly reported difficulty. While wait-times were pointed to as a major inconvenience, participants also felt that long waits indicated that healthcare institutions viewed the lives of low-

SES patients as trivial. Other logistical barriers reported by the majority of participants included coordinating care between multiple providers, locating unfamiliar places, having to schedule appointments far in advance, and managing competing responsibilities (e.g., childcare).

Strained rapport and communication difficulties with healthcare professionals was the second major theme. Participants highlighted the patient-doctor relationship as one of the most important factors in determining whether their needs were met. However, participants noted feeling generally unheard at clinics and hospitals and described doctors and other health professionals as "uncaring", "dismissive", "rushed", and "untrustworthy." Participants also reported strong perceptions of stigma, which they noted discouraged adherence to recommendations and returning for future visits. Participant 010 stated:

> "I think poor people are labeled as drug addicts…as I don't know. It just seem like you get treated different if you're on welfare or have multiple children or whatever. It just seem like you get treated different in healthcare and in society period. You get labeled a lot and that gets in the way."

Moreover, several participants stated that the power differential between patients and providers was a deterrent ("You kind of get stuck with what you get stuck with. It's like, she's the doctor so I can't argue with her." [Participant 002]).

The third and final superordinate theme was the negative impact of physical and emotional distress. Participants explained that feeling "overwhelmed", "frustrated", "agitated", and "irritated" impairs healthcare seeking. Healthcare use

was described as an effortful endeavor that requires a certain motivation, which may be low during times of distress. Participant 005 explained:

> "It's just a lot sometimes, and I don't know. I see the appointment date there on the paper, and I know I'm supposed to go…that I need to go and see my doctor…but I just don't feel like it, so I don't."

Participants also mentioned the value of social support from an emotional standpoint. Participant 009 stated:

> "I had no support. There was nobody rooting for me, nobody checking on me. I got to a point where I was saying man, nobody really cares what happens so why should I?"

In addition, a number of participants explained that although pain does not interfere with seeking urgent care, pain often deters them from keeping outpatient appointments.

Focus Groups

Seven case managers at a community mental health clinic participated in focus groups centered on healthcare challenges faced by homeless adults. Due to scheduling considerations, four case managers participated in one focus group, and three participated in another. Group meetings were 90 minutes. Case managers' ages ranged from 24 to 31 years (M = 28.6, SD = 3.05). Six case managers were female, and one was male. All seven were Caucasian. Participants reported 1.5 to 4 years work experience as case managers (M = 2.7, SD = .88).

Case managers' responses were organized into three superordinate categories: healthcare challenges related to individual-level health impairments, obstacles

specific to healthcare settings, and logistical issues associated with homelessness. Many of the healthcare challenges discussed in the focus groups echoed concerns described in the semi-structured interviews with homeless adults. Focus group data analysis is presented in Table 1.

Pilot Testing

Ten pilot participants were interviewed regarding their perceptions of the HUSEL initial item pool. Pilot participants' mean age was 43.5 years (*SD* = 8.13, range: 26 – 52). Five participants were female; five participants were male. Eight participants reported that they were African-American. One participant reported that she was Caucasian, and one participant reported that she was African-American and Caucasian.

Overall, participants reported that the items appeared to be relevant to confidence in their abilities to use healthcare services. Four items were identified as confusing and were subsequently discarded. Participants found the other items to be clear, straightforward, and easy to understand.

Preliminary Analyses and Data Screening

Prior to conducting quantitative analyses, variables were screened for missing values and the presence of outliers. In addition, relevant statistical assumptions were checked.

Missing data. Two cases were found to have missing values for the HUSEL, SF-12-MCS, SF-12-PCS, and age. Because the proportion of missing data was so low in these variables (1.5% of total cases), a missing value intervention was not warranted. For analyses involving these variables, pairwise deletion was employed.

Univariate outliers. Z-scores were computed for continuous variables, and cases with z-scores of ± 2.5 were examined (Hair, Anderson, Tatham, & Black, 1998). Nine univariate outliers were detected. Specifically, there was one outlier found for HUSEL-Health Care Use Behaviors subscale, SRAHP, SF-12-PCS, and SF-12 MCS. Two were found for GSE and MHCL-Powerful Others Externality subscale, and three were found for MHCL-Internality subscale. Due to the low frequency of outliers on any one measure (.8 - 2.3% of total cases), and the fact that these outlier scores were not exceptionally extreme or unusual (i.e., none with a z-score of ± 3.26), they were allowed to remain (Cohen, Cohen, West, & Aiken, 2003).

Response frequencies for categorical variables were examined to determine whether a response option was selected by greater than 90% or less than 10% of the sample. There were no outliers detected in any of the categorical variables.

Multivariate outliers. Mahalanobis distance was computed for each case on the four continuous study variables (e.g., HUSEL, SF-12 PCS, SF-12 MCS, and age). Distance scores were evaluated with a chi-square distribution using 18.47 as the criterion value (4 degrees of freedom, $p < .001$). No multivariate outliers were detected.

Normality. Skewness and kurtosis values for all continuous variables were within the +1.0 to -1.0 range, with the exception of age, which demonstrated fairly strong negative kurtosis (-1.18). An inverse square root transformation was performed on age, which decreased skewness to -.98. Normality for continuous variables was also examined using the Kolmogorov-Smirnov test, which tests the null hypothesis that the study sample distribution does not differ from a normally

distributed reference sample. The Kolmogorov-Smirnov statistic was non-significant (i.e., $p > .01$) for HUSEL, SF-12 PCS, and SF-12 MCS scores. The Kolmogorov-Smirnov statistic was significant for the inverse square root transformation of age (i.e., $p < .01$), indicating that this variable was not normally distributed. Age was included in the regression analyses despite its significant Kolmogorov-Smirnov statistic because it demonstrated acceptable levels of skewness and kurtosis and serves as a theoretically important covariate in the models.

Kolmogorov-Smirnov tests were also used to assess whether HUSEL total score was normally distributed across levels of categorical variables (i.e., gender, insurance status, and five types unmet healthcare need). Kolmogorov-Smirnov statistics were all non-significant (i.e., $p > .01$), indicating normality.

Linearity. Pairwise linearity for continuous variables was determined to be satisfactory based on examination of bivariate scatterplots.

Homoscedasticity. Homogeneity of variance in the dependent variable across the range of values in the independent variable was examined using Levene's test and scatter plots of the standardized dependent variable against standardized residuals. None of the Levene's test statistics were significant (i.e., $p > .05$), and the scatter plots indicated homoscedasticity.

Multicollinearity. Variance inflation factor (VIF) values were examined for all independent variables in each of the regression analyses. Using a conservative criterion VIF value of 2.5 as recommended by Allison (1990), there were no indications of multicollinearity.

Independent variable specification. Only relevant independent variables were included in the regression analyses.

Descriptive Analyses

Sociodemographic characteristics. Participants' mean age was 39 years 4 months (*SD* = 12.2), and ages ranged from 19 to 68 years. The majority was male (70%) and African-American (70%). There were no participants who self-identified as transgender or any category other than male or female. Eighty-five percent of the sample reported that they were not currently in a romantic relationship, and 15% reported that they were either married or in a committed relationship. Forty percent of participants reported that they did not have children. Fifteen percent reported having one child; 18% reported having two children; 11% reported having three, and 15% reported having four or more. Twenty-eight percent of the sample reported that they had children under age 18 years.

Forty percent of participants were unemployed and looking for work. Eleven percent were unemployed and not looking for work, and 36% were unable to work due to disability. The bulk of the sample (71%) reported that their annual income was between $0 – 5,000. Precisely half of the sample completed a high school diploma. Forty percent did not graduate from high school, and 10% completed either an Associate's or Bachelor's degree.

The majority of the sample (66%) reported that they had been without stable housing continuously for the past 12 months, and 68% reported that they had been without stable housing for four or more different periods in the past three years. Twenty-nine percent reported that they have to leave the place they are currently

staying in the next week. Slightly more than half (56%) of participants reported that they had lived in three or more different types of housing in the past 12 months. During that period, 44% reported that they had lived in a shelter, 28% in a hotel or motel, 70% with a friend or family member, 21% in jail or prison, 46% in a place not meant for habitation (e.g., park, car, empty building), and 31% in their own home. See Table 2 for additional sociodemographic information.

Health and healthcare-related characteristics. Self-reported height and weight was used to calculate body mass index (BMI; pounds/inches^2). Average BMI was 27.6, which appears to be slightly higher than the U.S. average of 26.55 (CDC, 2015). Using BMI categories published by the Centers for Disease Control and Prevention (CDC, 2015), 41% of the sample fell in the "Normal" range; 28% fell in the "Overweight" range; and 30% fell in the "Obese" range. One participant was in the "Underweight" range. Seventy-two percent of the sample reported that they smoke cigarettes. Self-reported physical and mental health status was assessed using the SF-12. Mean SF-12 Physical Health Composite score was 42.48 (*SD* = 9.91) which is close to one standard deviation below the norm.

Mean SF-12 Mental Health Composite score was 35.87 (*SD* = 10.8), which is approximately 1.5 standard deviations below the norm. Mean DASS-Depression score was 18.47 (*SD* = 10.05, range: 0–42). Using the depression severity categories published by the developers of the DASS (Lovibond & Lovibond, 1995), 15% of participants fell in the "Normal" range; 12% fell in the "Mild Symptoms" range; 41% fell in the "Moderate Symptoms" range; 13% fell in the "Severe Symptoms" range, and 19% fell in the "Extremely Severe Symptoms" range. Eighty-nine percent of

participants noted a past psychiatric diagnosis, and 84% reported a history of psychiatric treatment.

Roughly one-third of participants (34%) reported that they did not have any form of health insurance. Slightly more than half of the sample (55%) reported having a regular place they receive health care services, and half (50%) reported having a primary care physician. Lastly, 85% of the sample reported having at least one unmet healthcare need in the past year, and 36% of participants reported having four or more unmet healthcare needs during that time period. Mean number of non-urgent, ambulatory care visits in the past year was 1.7 (*SD* = 2.86, range: 0–12), which includes the 53% of participants who reported zero visits. Mean number of emergency department (ED) visits in the past year was 3.58 (*SD* = 4.89, range: 0–31), which includes the 25% of participants who reported zero visits. Thirty-four percent reported four or more ED visits during that time period. See Table 2 for additional details regarding healthcare use.

Health beliefs. Means, standard deviations, and ranges for scores on measures of health-related beliefs are provided in this section.

General Self-Efficacy. The General Self-Efficacy scale (GSE) mean score was 28.14 (*SD* = 6.55, range: 10–40), which appears to be slightly lower than the GSE mean score of 29.48 (*SD* = 5.13) found in a sample of 1,594 American adults (Schwarzer & Jerusalem, 1995).

Health Self-Efficacy. Self-Rated Abilities for Health Practices scale (SRAHP) mean score in our sample was 63.15 (*SD* = 21.9, range: 8–112). This score appears to be substantially lower than the mean SRAHP score found in a sample of

adults attending a health fair (N = 188, M = 84.69, SD = 16.91) as well as the mean SRAHP score found in a sample of adults with disabilities (N = 117, M = 79.87, SD = 17.03) (Becker et al., 1993). The most common disabilities reported in that sample were paralysis, cerebral palsy, and post-polio syndrome.

Health Values. The Health Value Scale mean score in our sample was 20.18 (SD = 5.06, range: 10–28). This score appears to be similar to that found in a large undergraduate sample (N = 1,026, M = 20.34, SD = 4.41; Lau et al., 1986).

Health Locus of Control. Mean scores were calculated for the three scales included in the Multidimensional Health Locus of Control Scales. The mean score for the internality scale was 26.18 (SD = 5.98, range: 6–36). The mean score of the powerful others externality scale was 22.55 (SD = 6.23, range: 6–36), and the mean score of the chance externality scale was 20.74 (SD = 7.31, range: 6–36). This internality scale score appears to be similar to the internality score (M = 25.75, SD = 4.13) found in a sample of 159 undergraduate students (Roddenberry & Renk, 2010). The external locus of control subscale scores in the present sample appear to be somewhat higher than the chance externality score (M = 16.76, SD = 4.67) and the powerful others externality score (M = 16.09, SD = 4.65) reported in that same sample of undergraduates.

Healthcare Use Self-Efficacy. Mean HUSEL total score was 57.67 (SD = 22.9, range: 9.33–100). Mean scores for the HUSEL-Barriers Self-Efficacy and HUSEL-Healthcare Use Behaviors Self-Efficacy subscales were 54.42 (SD = 23.93, range: 3–100) and 64.17 (SD = 24.79, range: 2–100), respectively. Using the scale anchor points included in the HUSEL instructions, scores indicate that confidence

appraisals were above "medium" and that participants were somewhat more than "moderately certain" of their healthcare use abilities.

Item Selection

A series of analyses was conducted to inform decisions regarding which of the 77 HUSEL items in the initial pool to retain in the final set. Skew and kurtosis values were converted to z-scores and examined using a critical score of |3.29|, which corresponds to an alpha of .001 (Kim, 2013). Six items were discarded based on skewness. None were discarded based on kurtosis. Partial correlations were calculated between items and total scale scores in order to detect correlations less than 0.20. In calculating item-total partial correlations, the particular item of focus was excluded from the total score in order to avoid artificially inflating the correlation (Streiner & Norman, 1989). Zero items were discarded due to insufficient item-total partial correlations. Inter-item correlations were examined in order to detect correlations greater than 0.75 or less than 0.20. The goal was to ensure that items were correlated enough to indicate unidimensionality but not so much so that they were redundant (Clark & Watson, 1995). Twelve items were discarded due to excessive inter-item correlations. Thirteen items were discarded due to content redundancy.

An exploratory factor analysis was conducted of the remaining 46 HUSEL items. Principle axis factoring (PFA) was selected as the extraction method. This extraction method uses initial communality estimates based on the correlation matrix as opposed to simply assuming initial communalities are 1.00, as done in principal components analysis (PCA). As such, PFA is considered the more conservative route

and often provides more accurate, albeit smaller, factor loadings. A promax rotation was used to achieve simple structure. As an oblique rotation strategy, promax rotation assumes factors are correlated, which fits with the theoretical expectation that lower-order factors of healthcare use self-efficacy should be related.

A two-factor solution provided the clearest extraction. First, the scree plot demonstrated a substantial drop-off after Factor Two. Second, those two factors accounted for a sizeable portion of explained variance (56%). Third, each of the successive factors only accounted for a small portion of explained variance (less than or equal to 4%). Using this two-factor solution, items that did not load at least moderately (≥ .40) on either factor were discarded. Items with moderate loadings (≥ .40) on both factors were also discarded. Additionally, items with a strong loading (≥ .50) on one factor and a loading of greater than or equal to .30 on the other were discarded. Two items with very strong loadings on one factor (≥.70) and loadings of .33 and .34 on the other factor were pardoned due to their theoretical importance and the value assigned to them during qualitative analysis. Fifteen items were discarded at this step.

A second exploratory factor analysis was conducted using the remaining 31 items. Again, items were discarded through a decision process based on factor loadings as described above. Four items were also discarded because they were conceptually unrelated to the other items on their factor. In total, sixteen items were discarded at this step.

Using the remaining 15 items, a third exploratory factor analysis was conducted. Bartlett's test of sphericity was significant ($\chi^2 = 1317.98$, df = 105, $p <$

.01), indicating that the correlation between variables was sufficient for principal factor analysis. The Kaiser-Meyer-Olkin test value was .93, which also indicates that the data are appropriate for principal factor analysis. The two-factor solution accounted for 66% of explained variance. All factor loadings were satisfactory (see Table 4), and items appeared to be organized into two conceptually meaningful factors. Factor one included ten items related to self-efficacy to manage barriers and was named the Barriers Self-Efficacy factor. Factor two included five items related to self-efficacy regarding general healthcare use behaviors and was named the Healthcare Use Behavior Self-Efficacy factor. The factors were strongly correlated with each other (see Table 4), and item-total correlations ranged from .59 to .81. Item means, standard deviations, and ranges as well as item-total correlations are provided in Table 5.

Primary Analyses

Hypothesis 1a: Face validity. Pilot participants described the items as relevant to the construct of healthcare use self-efficacy. In addition, pilot participants found the items clear and easy to interpret. These qualitative findings suggest that the HUSEL items have adequate face validity.

Hypothesis 1b: Convergent validity and divergent validity. It was hypothesized that HUSEL total score would demonstrate positive associations with scores from assessments of theoretically related constructs, namely general self-efficacy as measured by the General Self-Efficacy Scale (GSE) and health self-efficacy as measured by the Self-Rated Abilities for Health Practices Scale (SRAHP).

HUSEL total score was correlated with GSE ($r = .59$, $p < .01$) and SRAHP ($r = .75$, $p < .01$) scores as hypothesized.

It was also hypothesized that HUSEL total score would demonstrate small or non-significant associations with scores from assessments of theoretically unrelated constructs, namely health values as measured by the Health Value Scale (HVS) and health-related locus of control as measured by the Multidimensional Health Locus of Control Scales (MHLC). As hypothesized, HUSEL total scores were not significantly correlated with scores on the HVS or either of the MHLC external locus of control subscales (i.e., chance and powerful others). HUSEL total score demonstrated a small correlation that approached statistical significance with the MHLC internal locus of control subscale ($r = .17$; $p = .06$). Additionally, it was hypothesized that HUSEL total score would demonstrate a negative correlation with depressive symptoms as measured by the DASS-Depression subscale. This hypothesis was supported. See Table 6 for full divergent-convergent correlation matrix.

Hypothesis 1c: Criterion validity. HUSEL total score was significantly related to number of non-urgent, ambulatory care visits in the past year after controlling for demographic (i.e., age, gender) and health-related variables (i.e., health insurance status, case management enrollment). Demographic and health-related variables accounted for significant variance at Step 1, $R^2 = .07$, $F(4,125) = 2.51$, $p < .05$, $f^2 = 08$. At Step 2, HUSEL total score was the only significant independent variable ($\beta = .24$, $t = 2.69$, $p < .01$) and made a significant contribution to the model, $\Delta R^2 = .05$, F-change$(1,124) = 7.23$, $p < .01$, with a squared semi-partial

correlation of .05. The final regression equation accounted for 12.5% of the variance (R^2) in number of non-urgent, ambulatory care visits in the past year, $F(5,124) = 3.55$, $p < .01$ and had a small-to-moderate effect size, $f^2 = .14$. See Table 8 for all regression coefficients from the final equation.

Hypothesis 1d: Incremental validity. Number of non-urgent, ambulatory care visits in the past year demonstrated a slightly larger correlation with HUSEL Total score ($r = .29$, $p < .01$) than with SRAHP-Health Practices ($r = .21$, $p < .01$). In addition, HUSEL total score was significantly related to number of non-urgent, ambulatory care visits in the past year after controlling for SRAHP-Health Practices (see Table 9). SRAHP-Health Practices score accounted for significant variance at Step 1, $R^2 = .04$, $F(1,128) = 5.87$, $p < .05$, $f^2 = 05$. At Step 2, HUSEL Total score was significant ($\beta = .27$, $t = 2.35$, $p < .05$) and made a significant contribution to the model, $\Delta R^2 = .04$, F-change$(1,127) = 5.53$, $p < .05$, with a squared semi-partial correlation of .04. The final regression equation accounted for 8% of the variance (R^2) in number of non-urgent, ambulatory care visits in the past year, $F(2,127) = 5.81$, $p < .01$ and had a small effect size, $f^2 = .09$.

Hypothesis 1e: Internal consistency. Cronbach's alpha was calculated as an index of internal consistency. HUSEL total score, HUSEL-Barriers Self-Efficacy subscale, and HUSEL-Healthcare Use Behaviors subscale demonstrated good internal consistency with alphas of .94, .92, and .89 respectively.

Hypothesis 1f: Temporal consistency. The HUSEL demonstrated good test-retest reliability as indicated by a Pearson correlation of .77 ($p < .01$) between initial and follow-up assessments. Average number of days between administrations was 22

days and ranged from 8 to 42 days. It is notable that only 16 participants provided follow-up data. Attrition analyses demonstrated that there were no significant differences between the follow-up sample and the non-follow-up sample by age ($t(129) = -.46$, p = n.s.), gender (χ^2 (1, $N = 131$) = 1.06, p = n.s.), HUSEL total score ($t(129) = -.63$, p = n.s.), SF-12-Mental Health Composite ($t(127) = -.13$, p = n.s.), or SF-12-Physical Health Composite ($t(127) = -.21$, p = n.s.).

Hypothesis 2a: Relationship between healthcare use self-efficacy and unmet healthcare need. A series of hierarchical regression analyses were conducted to investigate the relationship between healthcare use self-efficacy and unmet healthcare needs. Age, gender, insurance status, case management enrollment, and perceived health status (SF-12 composite scores) were entered at Step 1. HUSEL total score was entered at Step 2. Dummy codes were used for gender (male = 1, female = 0), insurance status (some form of current insurance = 1, no current insurance = 0), and case management enrollment (enrolled in case management services = 1, not enrolled in case management = 0). Unmet healthcare need was entered as the dependent variable.

Of the five types of healthcare need assessed (i.e., medical/surgical, mental health, prescription medication, dental, vision), HUSEL total score demonstrated significant point-biserial correlations with unmet medical/surgical need and unmet mental healthcare need. HUSEL total score also demonstrated a significant Pearson correlation with overall unmet healthcare need. Inter-correlations for all variables included in regression analyses are provided in Table 7. Due to the lack of correlation with HUSEL total score, regression analyses were not run with unmet

prescription medication need, unmet dental need, or unmet vision need as the dependent variable. Because unmet medical/surgical need and unmet mental health need are dichotomous variables, logistic regression was used. Dummy codes were used for unmet medical/surgical need and unmet mental health need (unmet need = 1, no unmet need = 0). A linear regression equation was conducted with total unmet need as the dependent variable because total unmet need is a continuous variable.

HUSEL total score was a significant independent variable in determining categorization of cases by unmet medical/surgical need (see Table 10). Results found that for each single point increase in HUSEL total score, there was a .02 times lesser likelihood of having an unmet medical/surgical need while controlling for demographic (i.e., age, gender) and health-related factors (i.e., health insurance status, case management enrollment, perceived physical health status). Health insurance was the only other significant independent variable in the final equation. Individuals with insurance were 3.86 times less likely to have an unmet medical/surgical need than those without insurance. The overall model was significant with all independent variables entered, χ^2 (6, N = 129) = 20.40, $p < .01$, and accounted for 20% of the total variance (Nagelkerke pseudo R^2). The overall categorization success rate was 66.7%, with a correct categorization rate of 80.5% for individuals without an unmet medical/surgical need and 46.2% for those with an unmet medical/surgical need.

HUSEL total score was not a significant independent variable in determining categorization of cases by unmet mental health need while controlling for demographic (i.e., age, gender) and health-related factors (i.e., health insurance status, case management enrollment, perceived mental health status). Health insurance and

perceived mental health status were the only significant independent variables in the final equation. Individuals with insurance were 2.85 times less likely to have an unmet mental healthcare need than those without insurance. Results also demonstrated that for every one-point increase in SF-12-Mental Health Composite score, there was a .08 times lesser likelihood of having an unmet mental health need. The overall model was significant with all independent variables entered, χ^2 (6, N = 129) = 29.02, $p < .01$, and accounted for 27% of the total variance (Nagelkerke pseudo R^2). The overall categorization success rate was 67.4%, with a correct categorization rate of 75% for individuals without an unmet mental health need and 59% for those with an unmet mental health need. See Table 11 for all regression coefficients in the final equation.

HUSEL total score was not significantly related to overall unmet healthcare need after controlling for demographic (i.e., age, gender) and health-related variables (i.e., health insurance status, case management enrollment, perceived mental health status, perceived physical health status). Demographic and health-related variables accounted for significant variance in overall unmet need at Step 1, $R^2 = .264$, $F(6,122) = 7.30$, $p < .01$, $f^2 = 36$. At Step 2, HUSEL total score was not a significant predictor ($\beta = .12$, $t = 1.34$, p = n.s.) and did not make a significant contribution to the model, $\Delta R^2 = .01$, F-change(1,121) = 1.79, p = n.s. However, health insurance status ($\beta = -.23$, $t = -2.54$, $p < .05$), SF-12 Physical Health Composite ($\beta = -.22$ $t = -2.76$, $p < .01$), and SF-12 Mental Health Composite ($\beta = -.46$, $t = -5.08$, $p < .01$) were significant predictors, with squared semi-partial correlations of .04, .05, and .15, respectively. The final regression equation accounted for 27.5% of the variance (R^2)

in overall unmet healthcare need, $F(7,121) = 6.55$, $p < .01$ and had a moderate effect size, $f^2 = .38$. See Table 12 for all regression coefficients in the final equation.

Hypothesis 2b: Relationship between healthcare use self-efficacy and health status. I also investigated the relationships between healthcare use self-efficacy and perceived physical and mental health status. HUSEL total score was significantly correlated with the SF-12 Mental Health Composite score but not with the SF-12 Physical Health Composite score (see Table 7). A hierarchical regression was performed with SF-12 Mental Health Composite as the dependent variable. Age, gender, and health insurance status were entered at Step 1. HUSEL total score was entered at Step 2. Dummy codes were used for gender (male = 1, female = 0) and insurance status (some form of current insurance = 1, no current insurance = 0).

HUSEL total score was significantly related to SF-12 Mental Health Composite after controlling for demographic and health-related variables (see Table 13). Demographic and health-related variables did not account for significant variance in SF-12 Mental Health Composite at Step 1, $R^2 = .06$, $F(4,124) = 1.80$, $p =$ n.s. At Step 2, HUSEL total score was the only significant predictor ($\beta = .48$, $t = 5.87$, $p < .01$), demonstrated a squared semi-partial correlation of .21, and made a significant contribution to the model, $\Delta R^2 = .21$, F-change$(1,123) = 34.42$, $p < .01$. The final regression equation accounted for 26% of the variance (R^2) in SF-12 Mental Health Composite $F(5,123) = 8.71$, $p < .01$ and had a moderate effect size, $f^2 = .36$.

Discussion

The goal of this study was to develop and validate a measure of healthcare use self-efficacy. Item development was informed by self-efficacy theory and health

behavior research. In addition, qualitative data collected from interviews with homeless adults and focus groups with case managers were used to ensure that items adequately accounted for the full scope of the target construct and accurately reflected the experiences of homeless adults. An initial item pool was whittled down to fifteen items selected to comprise the Healthcare Use Self-Efficacy List (HUSEL). Analyses indicated that the HUSEL includes two lower-order factors – self-efficacy regarding general healthcare use behaviors and self-efficacy to manage barriers to care. Results indicated that the HUSEL has strong face validity, convergent validity, divergent validity, criterion validity, and incremental validity. The HUSEL also demonstrated good internal consistency and temporal reliability. Lastly, healthcare use self-efficacy was found to be related to unmet medical/surgical need in the past year as well as perceived mental health status. These findings are discussed in greater detail below.

Convergent and Divergent Validity

The HUSEL exhibited sound convergent and divergent validity as demonstrated by a pattern of correlations with measures of theoretically related and unrelated constructs.

To assess convergent validity, correlations between the HUSEL and other measures of self-efficacy were examined. The HUSEL was moderately correlated (.59) with the General Self-Efficacy scale, which assesses one's global sense of confidence in coping with nonspecific challenges. Healthcare use self-efficacy is moderately broad in scope in that it encompasses beliefs about abilities to use a range of healthcare services, as opposed to a single type, such as dental care or urgent care.

For this reason, it was not unexpected that the HUSEL demonstrated a medium-sized correlation with a measure of general self-efficacy. Additional context is provided by the large correlation (.68) observed between the General Self-Efficacy scale and a measure of health self-efficacy, the Self-Rated Abilities for Health Practices scale. Health self-efficacy consists of beliefs regarding a range of health behaviors (e.g., diet, exercise) and is wider in scope relative to the more unidimensional construct of healthcare use self-efficacy. For this reason, these two correlations fit with the theory-based expectation that general self-efficacy would demonstrate a stronger correlation with the more broadly defined construct of health self-efficacy than the more narrowly defined construct of healthcare use self-efficacy.

The HUSEL was highly correlated (.75) with a measure of health self-efficacy. As noted above, health self-efficacy refers to confidence regarding a range of health behaviors. It is likely that the skills developed to perform general health behaviors overlap with the skills needed for healthcare use. Self-efficacy beliefs regarding abilities based in similar skills sets are typically related (Woodruff & Cashman, 1993). Furthermore, a number of the health practices assessed as part of health self-efficacy include actions specific to healthcare use, such as monitoring for health concerns, determining what symptoms to report to a medical provider, and figuring out where to find health-related information.

The HUSEL demonstrated a small-to-medium sized inverse relationship (-.37) with a measure of depressive symptoms. This was expected, as low confidence in one's abilities, a bleak outlook of the world, and negative predictions about the future are hallmark cognitions of depression (Beck, Epstein, & Harrison, 1983; Gotlib &

Joormann, 2010). Research has documented the negative association between various health self-efficacy beliefs and depressive symptoms in a number of patient groups, including asthma (Mancuso, Rincon, McCulloch, & Charlson, 2001), type 2 diabetes (Sacco et al., 2005), chronic pain (Arnstein, Caudill, Mandle, Norris, & Beasley, 1999), and stroke (Robinson-Smith, Johnston, & Allen, 2000). Studies have also found that self-efficacy beliefs are lower in individuals with depression compared to non-depressed controls (Liew, Kimberly, Cronan, & Bigatti, 2013; Maciejewski, Prigerson, & Mazure, 2000).

Correlations between the HUSEL and other measures of health-related beliefs were examined in order to further evaluate divergent validity. It was hypothesized that these correlations would be absent or small if found to exist at all. As predicted, the HUSEL demonstrated a small, statistically non-significant correlation with a measure of health value (.14). This fits with previous studies that found no association between health value and health self-efficacy in patients recovering from orthopedic surgery (Waldrop et al., 2001) and in individuals with type 1 diabetes (Aalto & Uutela, 1997). However, it should be noted that small correlations between health value and health self-efficacy have also been documented (Jackson et al., 2007; Petrovic et al., 2011).

With regard to external health locus of control, the HUSEL demonstrated small, non-significant correlations with measures of external locus of control regarding chance (-.10) and powerful others (.11). Again, this generally reflects findings from existing research. For example, in a study of safe-sex behaviors in African-American college students, non-significant correlations were found between

health self-efficacy and both types of external health locus of control beliefs (Burns & Dillon, 2005). However, in a study of nutritional status in older adults, health self-efficacy demonstrated a small correlation with external locus of control beliefs concerning chance and no correlation with external locus of control beliefs concerning powerful others (Chen, Acton, & Shao, 2010). This pattern was flip-flopped in a study on predictors of return to work in individuals with back pain, where a small correlation was found between health self-efficacy and external locus of control regarding powerful others but not external locus of control regarding chance (Richard, Dionne, & Nouwen, 2011). In summary, health self-efficacy is often unrelated to external locus of control beliefs, although small correlations have also been noted.

Interestingly, there was a small-sized correlation (.17) that approached significance (p = .06) between HUSEL total score and a measure of internal health locus of control, which refers to the belief that health can be impacted by personal action. These constructs are considered to be theoretically distinct, and this association was not predicted. However, a weak association between these cognitive factors is by no means unheard-of. Research has demonstrated similarly small-sized associations between health self-efficacy and internal locus of control in older adults (Jacobs-Lawson, Waddell, & Webbas, 2011), patients with diabetes (O'Hea et al., 2009), and African-American college students (Burns & Dillon, 2005). It is probable that the link between healthcare use self-efficacy and internal locus of control occurs because both beliefs are influenced by a shared set of experiences. Consider an individual with asthma who is able to effectively manage respiratory difficulties.

This individual would understandably develop positive asthma self-efficacy beliefs as well as the more general understanding that personal action has the potential to affect health.

In summary, results illustrated that the HUSEL was moderately related to a broad measure of general self-efficacy and strongly related to a more domain-specific measure of health self-efficacy. The HUSEL was inversely related to a measure of depressive symptoms and demonstrated no relationship or weak associations with measures of health value and health locus of control. The HUSEL nestled into a correlation matrix of related and unrelated constructs in a way that was theoretically meaningful, providing strong support for the measure's convergent and divergent validity.

Criterion validity

Healthcare use self-efficacy accounted for significant variance in the rate of non-urgent ambulatory care use in the past year while controlling for age, gender, insurance status, and case management enrollment. Regardless of the domain, assessments of self-efficacy should be related to a target behavior. The HUSEL was created to assess self-efficacy beliefs that influence healthcare behaviors, and this finding is an indicator of good criterion validity.

The link between health self-efficacy beliefs and health-related behaviors is well established (Gillis, 1993; Holden, 1991). HIV Adherence Self-Efficacy Scale (HIV-ASES) scores have been shown to be associated with medication adherence in individuals with HIV (Johnson et al., 2007). Exercise Self-Efficacy scale (EXSE) scores have been linked to physical activity outcomes (Motl, Snook, McAuley, &

Gliottoni, 2006), and Smoking Abstinence Self-efficacy Questionnaire (SASEQ) scores have been shown to predict smoking abstinence at one-year follow-up (Spek et al., 2013). Explaining or predicting a target health behavior is one of the primary functions of a domain-specific health self-efficacy measure. Evidence of criterion validity is a critical component in determining that the HUSEL is suited for that task.

Incremental validity

Incremental validity is "the degree to which a measure explains or predicts some phenomena of interest, relative to other measures" (Haynes & Lench, 2003, p. 2). Because non-urgent, ambulatory care is a crucial healthcare use behavior, number of non-urgent, ambulatory care visits in the past year was chosen as the criterion variable in assessing incremental validity. Health practice self-efficacy, as measured by a subscale of the SRAHP, was selected as the comparison measure. Health self-efficacy is commonly used in studies investigating healthcare use behaviors (e.g., Chang et al., 2014; Richards et al., 2009; Suzuki, Krahn, McCarthy, & Adams, 2007). The Health Practices subscale was used in this analysis because it is conceptually more similar and statistically more related to healthcare use self-efficacy. As such, it provided a more rigorous test of incremental validity than the SRAHP total scale score of health self-efficacy.

Number of non-urgent, ambulatory care visits in the past year was more strongly correlated with HUSEL total score than with SRAHP Health-Practices subscale score. Moreover, HUSEL total score was found to account for significant variance in non-urgent, ambulatory care use above and beyond the variance accounted for by SRAHP-Health Practices subscale score. Although the effect size

was small, these results demonstrate the incremental validity of the HUSEL in comparison to a commonly used assessment measure. When designing a new measure, evidence of incremental validity is key in establishing its usefulness (Hunsley & Meyer, 2003). This is particularly important when introducing a measure into an area as extensively researched as self-efficacy where the potential for redundant assessment tools is high.

Reliability

The HUSEL demonstrated good reliability properties. Cronbach's alphas were examined as an index of internal consistency, and test-retest coefficients were calculated in order to investigate temporal stability. Cronbach's alphas were high for the HUSEL total score as well as the two subscale scores - the Healthcare Use Behavior Self-Efficacy subscale and the Barriers Self-Efficacy subscale. Test-retest correlations for HUSEL total score and subscales were also high, indicating that the HUSEL performed consistently across multiple administrations at different time-points. However, temporal stability conclusions based on this finding are limited by the small sample size at follow-up. Of 131 participants, only 16 (12%) returned to complete the second questionnaire administration at time-point two.

Relation of healthcare use self-efficacy to unmet healthcare need

It was hypothesized that healthcare use self-efficacy would be inversely related to unmet healthcare need. The occurrence of five types of unmet need in the past year was assessed (medical/surgical, mental health, dental, vision, and prescription medication). A sum total was calculated across the five categories to

create an overall unmet need score that ranged from zero (no unmet needs) to five (unmet needs in all categories). Correlational analyses indicated that healthcare use self-efficacy was associated with medical/surgical unmet need, mental health unmet need, and overall unmet need. Regression analyses were used to examine those associations in greater detail while controlling for age, gender, health insurance status, case management enrollment, and subjective health status. Insurance was a significant variable in each of the regression equations and is discussed at the end of this section.

Healthcare use self-efficacy was significantly related to unmet medical/surgical need while controlling for relevant demographic and health-related variables. Specifically, results illustrated that for each single point increase in HUSEL total score, there was .02 times lesser likelihood of having an unmet medical/surgical need. Although statistically significant, the clinical significance of this small effect size may not be immediately clear.

Clinical significance is most accurately understood when the relevant context is accounted for (Kazdin, 1993), and small effect sizes in health-related research may have weighty consequences, particularly in analyses where the dependent variable is dichotomous (Rutledge & Loh, 2004). The implications of an unmet medical/surgical need are grave. Indeed, research has shown that unmet medical need is a significant risk factor of increased mortality (Wilper et al., 2009).

Second, it is important to remember that HUSEL scores are based on a scale ranging from 0 to 100. While a single point in either direction may not substantially shift the odds of an unmet need occurring, there is the potential that a multiple-point

move on the scale may have a meaningful impact. Consider an example using the regression equation from the current study where *e* is raised to the power of the regression coefficient multiplied by HUSEL difference score. An individual with a HUSEL score of 60 is approximately one-third (.30) less likely to have an unmet medical/surgical need as an individual with a HUSEL score of 40. This hypothetical change in self-efficacy score may be sizeable, but interventions have demonstrated that considerable improvements in self-efficacy beliefs are attainable (Lorig et al., 2001).

Regarding unmet mental health need, regression analysis demonstrated that while controlling for demographic and health-related factors, healthcare use self-efficacy was not a significant independent variable. In the final model, only health insurance status and mental health status were significant. Worse subjective mental health status was related to a slight increase in the likelihood of having an unmet mental healthcare need. This is not unexpected, as research has shown that mental health difficulties simultaneously increase the need for mental healthcare and impair access to services (Baggett et al., 2010; Desai & Rosenheck, 2005; Stein, Andersen, & Gelberg, 2007).

In regard to overall unmet healthcare needs, healthcare use self-efficacy was not a significant independent variable when controlling for the effects of demographic and health-related factors. With all covariates entered in the model, health insurance status, subjective physical health status, and subjective mental health status were significant variables. It was expected that poorer physical and mental health would be associated with increased number of unmet need categories endorsed. Worse

physical and mental health indicates greater healthcare need, which in turn means increased potential for unmet needs. Additionally, physical and mental health problems impair healthcare access and utilization (Desai & Rosenheck, 2005; Jacob et al., 2014; Kushel et al., 2001).

Individuals without health insurance had an increased likelihood of having an unmet medical/surgical need and an unmet mental health need. Lack of insurance was also associated with greater number of overall unmet need categories endorsed. This fits with existing research, as health insurance has been identified as a major predictor of healthcare utilization in homeless adults (Kushel et al., 2001). Financial barriers stemming from lack of insurance deter individuals from seeking health care and may cause clinics to deny services (Martens, 2009; Martins, 2008). In the homeless population, the link between not having insurance and poor access to health care has been a consistent theme in the literature (Baggett et al., 2010; White & Newman, 2015). This matter is especially troubling in Missouri, where in 2014, the Senate voted to reject the Medicaid expansion proposed under the Patient Protection and Affordable Care Act (Medicaid Managed Care Bill, 2014).

Relation of healthcare use self-efficacy to perceived health status

It was hypothesized that healthcare use self-efficacy would be positively related to subjective physical and mental health status. In other words, it was predicted that higher confidence in healthcare use ability would be associated with better perceived health.

Healthcare use self-efficacy was not correlated with subjective physical health status. I predicted that there would be a positive correlation, such that higher self-efficacy was associated with better self-rated physical health. One possible explanation for this lack of a correlation is that there is simply no relationship between healthcare use self-efficacy and perceived physical health status. A multitude of factors determine self-rated physical health status, many of which have little to do with healthcare services (Bailis, Segall, & Chipperfield, 2003). It may also be that for some individuals, health problems and increased healthcare need actually leads to stronger healthcare use self-efficacy beliefs.

However, in statistical analysis, absence of evidence is not evidence of absence (Altman & Bland, 1995). It would be an overreach to conclude that a lack of significant correlation between healthcare use self-efficacy and perceived physical health must only be due to lack of a relationship, especially in light of research that has demonstrated findings to the contrary. The association between self-efficacy and health outcomes is well documented (Holden, 1991). Another potential reason for this lack of a correlation is possible measurement error associated with the SF-12. The SF-12 was designed with the assumption that mental and physical health are unrelated, and as a result, the weights used in the scoring algorithm are based on a factor solution involving an orthogonal rotation. Consequently, negative weights are applied to the mental health subscales when calculating the physical health composite scale (Ware et al., 1996). As a consequence, the physical health composite score may be inflated in those who endorse mental health impairments (Chum, Skosireva, Tobon, & Hwang, 2016). While this issue needs further investigation, preliminary

findings have shown that the scoring procedures described here may be a confounding factor when using the SF-12 in homeless adults with mental health concerns (Chum et al., 2016).

Healthcare use self-efficacy was related to perceived mental health status while controlling for demographic and health-related factors. Although it is tempting to speculate about the influence of healthcare use self-efficacy on health outcomes by way of a path of relationships involving healthcare behaviors, healthcare utilization rates, and unmet healthcare needs, this study was not designed for that purpose. Furthermore, as noted above, there was no relation found between healthcare use self-efficacy and unmet mental healthcare need. The association found between healthcare use self-efficacy and perceived mental health status may be due to the relationship between self-efficacy beliefs and depressive symptoms. The SF-12 Mental Health Composite score is heavily influenced by depressive symptoms, such as decreased energy, low mood, and impaired productivity, and research has found that self-rated mental health as measured by the SF-12 is highly correlated with depressive symptoms (Vilagut et al., 2013). Analyses investigating the role of depression as a mediator may help us more fully understand this finding.

Limitations

Several study limitations exist. Issues related to study design, assessment methods, and sampling procedure may have limited the conclusions that can be drawn from these results as well as the generalizability of those conclusions.

First, due to the cross-sectional nature of this study, directionality of the relationships detected cannot be determined. For example, analyses demonstrated a significant association between healthcare use self-efficacy and rates of ambulatory care, however, it remains uncertain whether self-efficacy *predicts* ambulatory care use. While relationships between healthcare use self-efficacy and most outcomes are likely bi-directional, longitudinal and repeated measures designs are required to answer questions of causality.

Second, because this study involved only a single sample of participants, item selection analyses and measure validity analyses were based on the same dataset. This means that HUSEL scores were derived from a final item set that was administered as part of a large initial item pool. Although unlikely, it is possible that the other items in the initial item pool somehow influenced responses to the 15 items retained in the final item set. This design may be common practice in measure development and validation (Streiner & Norman, 1989), but nevertheless, this is another reason that further psychometric evaluation of the HUSEL is required.

Third, health status and healthcare utilization were assessed entirely by self-report. Subjective perceptions of health are a strong influence on help-seeking behavior (Kirana, Rosen, & Hatzichristou, 2009) and healthcare utilization (Al-Windi, Dag, & Kurt, 2002). Nonetheless, objective health evaluations from medical providers would have strengthened the current findings. Collateral information would have provided context for participants' healthcare needs. Similarly, medical records would have allowed for confirmation of healthcare use rates, the assessment of which required a one-year recall effort on behalf of participants.

Fourth, the generalizability of the test-retest results is limited by a small follow-up sample size. Of the 131 validation phase participants, 119 individuals provided permission to be contacted regarding follow-up. However, only 16 participants returned to complete a second survey. There are several factors that likely contributed to this discrepancy. Financial compensation was offered at time-one but not time-two. Further, the competing priorities and transportation challenges faced by this sample were likely factors in the low follow-up rate. Due to concerns about low follow-up rates, participants were allowed to participate outside of the predetermined one to three-week re-test window. This additional variability between administration points may have weakened conclusions regarding temporal stability.

Fifth, recruiting participants from a community mental health clinic limited sample diversity in two key ways. The large majority of participants reported a history of mental health diagnosis or treatment. Additionally, it is possible that due to the recruitment location, the present sample may have had higher healthcare use self-efficacy than average homeless adults. As a result of conducting this study at a community mental health clinic, engagement in a healthcare use behavior became a de facto inclusion criterion. Presenting to a mental health clinic is a healthcare use behavior.

Future Directions and Clinical Implications

As previously alluded to, psychometric evaluation in a more diverse homeless sample is needed to establish the validity and reliability of the HUSEL. The present study's sample was heterogeneous in numerous ways, including age, gender, race/ethnicity, education level, and housing history. However, the large majority of

the sample endorsed a history of mental health concerns. Future studies are needed with broader recruitment strategies to ensure that participants vary in regard to mental health history and subjective mental health status. This is particularly important in light of the association between depressive symptoms and self-efficacy beliefs. Recruitment efforts at shelters, food pantries, and homeless camps would help accomplish this goal. Moreover, broader recruitment would increase the opportunity to enroll participants who have little to no contact with the healthcare system. Future studies that involve a wider range of homeless individuals in terms of healthcare use behavior and mental health background would be positioned to determine whether the HUSEL is appropriate for use in the homeless population as a whole.

Future research is also needed in samples of participants who have not experienced homelessness. Difficulty accessing and utilizing healthcare is a major problem in the United States for adults with and without health insurance (Ayanian, Weissman, Schneider, Ginsburg, & Zaslavsky, 2000; Schoen, Osborn, Squires, & Doty, 2013; Sommers, Baicker, & Epstein, 2012). Although the HUSEL was developed in a sample of homeless adults, the set of difficulties assessed by the HUSEL may be relevant to the experiences of non-homeless individuals. Research in samples that represent the U.S. population are needed in order to investigate whether the HUSEL is appropriate for general use. Furthermore, additional psychometric testing is required to reassess test-retest reliability in a more adequately sized sample. Additional testing is also needed to confirm the HUSEL's factor structure.

Longitudinal research is another important step in establishing the HUSEL's construct validity. Specifically, research designs involving multiple time-points are

required in order to investigate the HUSEL's predictive validity. In studies of patients with rheumatoid arthritis, findings have shown that baseline self-efficacy predicts health status at two-year follow-up (Breeke, Hjortdahl, & Kvien, 2001) as well as perceived pain control at five-year follow-up (Breeke, Hjortdahl, & Kvien, 2003). Similarly, self-efficacy at time-one was found to predict breast self-examination behavior 12 to 15 weeks later at time-two in a sample of female undergraduate students (Luszczynska & Schwarzer, 2003). Future studies are needed to determine whether baseline HUSEL scores predict later healthcare use behaviors.

On a related note, longitudinal research is needed to understand whether healthcare use self-efficacy beliefs change over time, and if so, to understand what factors influence those changes. Improvements in self-efficacy are especially relevant in the context of interventions shown to enhance the healthcare use of homeless adults, such as participation in case management (Okin et al., 2000), engagement in assertive community treatment (Drukker et al., 2014; Wiley-Exley et al., 2013), and enrollment in a healthcare home (Rosenberg, Peele, Keyer, McAnallen, & Holder, 2012). Assessing healthcare use self-efficacy over the course of these interventions could provide a more in-depth understanding of how healthcare use behaviors change. This information could be used to adjust intervention planning. For instance, self-efficacy beliefs might be a factor that helps match individuals to the appropriate level of intervention intensity. Future research that establishes healthcare use self-efficacy as a significant factor in healthcare use behavior may support the development of interventions specifically designed to improve self-efficacy beliefs.

Intervention trials have demonstrated that health-focused self-efficacy beliefs are amenable to change, and that those changes are linked to improved outcomes (Marks et al., 2005). For example, in a large-scale randomized trial, Lorig and colleagues (2001) found that a seven-week group program for chronic disease management led to increased health self-efficacy, improved healthcare utilization, and better overall health status. Participants were individuals 40 years or older with a history of heart disease, lung disease, stroke, or arthritis. Similarly positive findings have been found in other self-efficacy based interventions designed to increase diabetes management (Steinbekk, Rygg, Lisulo, Rise, & Fretheim, 2012), asthma management (Katz, Yelin, Eisner, & Blanc, 2002), and dietary management (Prestwich et al., 2014).

Studies investigating mechanisms of change in self-efficacy interventions have yet to be conducted. However, it is likely those interventions tap into the four influence processes of self-efficacy proposed by Bandura's Social Cognitive Theory – performance accomplishments, vicarious experience, verbal persuasion, and psychological states (Bandura, 1977; Gist & Mitchell, 1992). Incorporating healthcare use self-efficacy beliefs into existing cognitive behavioral therapies (CBT) for anxiety and depression is highly feasible. Challenging maladaptive beliefs about healthcare use abilities and organizing activity-scheduling interventions and behavioral experiments around healthcare use behaviors are a natural extension of a CBT-based treatment.

Self-efficacy theory and research indicate that group-based treatments may be especially effective. In addition to the cost-efficiency inherent to a group format,

group-based treatments capitalize on the added degree of persuasion and vicarious learning offered by group members to one another. While developing a brief group treatment focused solely on healthcare use self-efficacy is one option, integrating a focus on healthcare use self-efficacy into pre-existing health behavior group treatments may be a more logical route. Multi-week, module-based group treatments such as "Illness Management and Recovery" and "Your Heart, Your Health" have been shown to improve participants' management of mental health disorders and cardiovascular risk factors, respectively (Balcazar, Alvarado, & Ortiz; Levitt et al., 2009; Mueser et al., 2006). These group treatments could be augmented with an additional session designed to increase participants' confidence level in their ability to access and utilize health services.

Findings from this study suggest that interventions to improve healthcare use self-efficacy may be particularly relevant when it comes to ambulatory care and unmet medical/surgical need. Although additional research is needed to confirm these findings, this study demonstrated that higher healthcare use self-efficacy is associated with increased number of non-urgent, ambulatory care visits in the past year as well as decreased likelihood of an unmet medical/surgical need in the past year. Further, the HUSEL could potentially be used as a screening tool to help identify individuals at risk for health care utilization difficulties. For example, low HUSEL scores could alert primary care clinics that certain patients might benefit from added support or outreach efforts. In addition, case management programs could use the HUSEL in assessing clients' strengths and weakness and developing treatment goals.

Conclusions

This study provides preliminary evidence for the reliability and validity of the Healthcare Use Self-Efficacy List (HUSEL), a new measure of self-efficacy specific to behaviors involved in healthcare access and utilization. The HUSEL demonstrated strong convergent and divergent validity through a pattern of correlations with other measures of self-efficacy, health value, health locus of control, and depressive symptoms. HUSEL scores were also related to a key index of healthcare use behavior – rates of non-urgent, ambulatory care. This relationship persisted while controlling for overall health self-efficacy, a factor commonly included in studies of health beliefs and healthcare use. Those results indicate good criterion and incremental validity. Cronbach's alpha indicated that the HUSEL has good internal consistency, and the test-retest correlation, although limited by small follow-up sample size, suggested good temporal stability. Lastly, HUSEL scores demonstrated relationships with unmet medical/surgical need and perceived mental health status while controlling for demographic and health-related variables. Additional psychometric evaluation is required. However, these findings indicate that the HUSEL is a useful measure of healthcare use self-efficacy in adults who are homeless.

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Table 1
Data Analysis for Focus Groups Involving Case Managers on Healthcare Challenges Faced by Homeless Adults (Content Organized Into Super- and Subordinate Categories)

Individual-level health impairments
Depressive symptoms
Poor self-care motivation
Feelings of hopelessness regarding treatment effectiveness and access to care
Negative predictions about the future
Anxiety symptoms
Avoidance of stressful healthcare experiences
Uncomfortable asking questions or expressing preferences
Substance use problems
Difficulties organizing daily activities
Decreased awareness of healthcare needs
Obstacles specific to healthcare settings
Procedural and navigational challenges
Limited scheduling options and confusing paperwork
Long wait-times as inconvenient and stigmatizing
Referrals to multiple specialists
Poor continuity of care (patients frequently reassigned to new providers)
Communication difficulties
Doctors perceived as uncaring, untrustworthy, and intimidating
Use of medical jargon
Doctors are insensitive when asking about substance use, sex, gender, and trauma
Doctors provide insufficient treatment rationale
Logistical issues associated with homelessness
Competing needs
Shelter, food, childcare
Unstable environment interferes with treatment adherence
"Survival mode" (managing basic needs makes it difficult to plan for the future)
Financial barriers
Lack of insurance
Lack of funds for co-pays, prescription medications, and transportation
Low social support
Poor instrumental and emotional support to cope with healthcare difficulties
Negative social support (encouragement to disengage from medical care)

Table 2
Sociodemographic Characteristics of Validation Phase Sample (N = 131)

Characteristic	Value
Age – *M years* ± *SD* (range)	39 ± 12.2 (19–68)
Gender – *n* (%)	
Female	39 (30)
Male	92 (70)
Race and ethnicity – *n* (%)	
African-American/Black	91 (70)
Caucasian/White	34 (26)
Hispanic/Latino	3 (2)
American Indian or Alaskan Native	6 (5)
Native Hawaiian or other Pacific Islander	1 (1)
Other	5 (4)
History of foster care – *n* (%)	
Yes	37 (28)
No	94 (72)
Education – *n* (%)	
3rd – 8th grade	12 (9)
9th – 11th grade	40 (31)
High school graduate or GED	66 (50)
Associate's degree	8 (6)
Bachelor's degree	5 (4)
Annual income – *n* (%)	
≥ $5,000	93 (71)
$5,001 – 12,300	31 (24)
%12,301 – 15,000	7 (5)
Current housing situation – *n* (%)	
Shelter	10 (8)
Hotel or motel	9 (7)
Transitional housing	3 (2)
Substance use treatment facility	2 (2)
Doubled-up	51 (40)
Group home	5 (4)
Psychiatric hospital or care facility	3 (2)
Place not meant for habitation	26 (20)
Independent house or apartment	19 (15)
Other	1 (1)

Note. Percentages may total to greater than 100 because participants endorsed multiple categories

Table 3

Healthcare Utilization Characteristics of Validation Phase Sample (N = 131)

Characteristic	*n*	%
Health insurance		
None	44	34
Private insurance	2	2
Medicaid	70	53
Medicare	25	19
Other public program	10	8
Other	3	2
Types of unmet healthcare need		
Medical/surgical	53	41
Mental health	63	48
Prescription medication	84	64
Dental	92	70
Vision	70	53
Sum total of unmet healthcare need categories endorsed		
Zero	20	15
One	17	13
Two	15	12
Three	32	24
Four	16	12
Five	31	24

Note. Percentages may total to greater than 100 because participants endorsed multiple categories

Table 4
HUSEL Item Factor Loadings and Factor Correlation (N = 131)

Item	Factor Loadings	
	Factor 1	Factor 2
How confident are you		
…in your ability to cope with a very long wait time at a clinic or doctor's office	**.51**	.11
…in your ability to get transportation to your doctor's appointments?	**.81**	-.05
…in your ability to get healthcare services when you feel irritable or agitated?	**.68**	.09
…that you can overcome the difficulty of having a doctor that seems rushed?	**.75**	-.02
…in your ability to get healthcare services if you are in pain?	**.59**	.12
…that you can manage the stress of getting healthcare services?	**.63**	.24
…in your ability to get healthcare services if there's no one to help you?	**.75**	-.03
…in your ability to get healthcare services when life gets really hard?	**.76**	.01
…in your ability to find affordable healthcare services?	**.82**	-.05
…in your ability to get healthcare services when you just don't feel like it?	**.57**	.26
…that you can figure out where to get healthcare services?	.22	**.63**
…that you can recognize when a health problem requires professional attention?	.04	**.75**
…in your ability to ask questions to a doctor?	-.20	**.86**
…that you can seek out information about where to get healthcare services?	.10	**.79**
…that you can take steps to get preventative care (wellness check-ups, flu-shots, etc.)?	.22	**.60**

	Factor Correlation	
	Factor 1	Factor 2
Factor 1	–	
Factor 2	.77**	–

Note. HUSEL = Healthcare Use Self-Efficacy List

Table 5
HUSEL Item Statistics (N = 131)

Item	Item M ± SD	Range	Item-Total Correla
How confident are you			
…in your ability to cope with a very long wait time at a clinic or doctor's office	56.87 ± 28.85	0 – 100	.59**
…in your ability to get transportation to your doctor's appointments?	57.32 ± 33.02	0 – 100	.72**
…in your ability to get healthcare services when you feel irritable or agitated?	48.93 ± 31.82	0 – 100	.76**
…that you can overcome the difficulty of having a doctor that seems rushed?	48.02 ± 29.49	0 – 100	.69**
…in your ability to get healthcare services if you are in pain?	63.36 ± 30.45	0 – 100	.65**
…that you can manage the stress of getting healthcare services?	56.41 ± 29.56	0 – 100	.81**
…in your ability to get healthcare services if there's no one to help you?	52.44 ± 33.12	0 – 100	.68**
…in your ability to get healthcare services when life gets really hard?	58.17 ± 32.12	0 – 100	.72**
…in your ability to find affordable healthcare services?	50.69 ± 32.66	0 – 100	.73**
…in your ability to get healthcare services when you just don't feel like it?	51.83 ± 29.99	0 – 100	.75**
…that you can figure out where to get healthcare services?	60.08 ± 30.82	0 – 100	.76**
…that you can recognize when a health problem requires professional attention?	67.18 ± 27.60	0 – 100	.69**
…in your ability to ask questions to a doctor?	70.84 ± 28.26	0 – 100	.56**
…that you can seek out information about where to get healthcare services?	62.60 ± 30.47	0 – 100	.78**
…that you can take steps to get preventative care (wellness check-ups, flu-shots, etc.)?	60.15 ± 31.06	0 – 100	.73**

Note. HUSEL = Healthcare Use Self-Efficacy List
**$p < .01$

Table 6

Divergent-Convergent Correlation Matrix (N = 131)

Variable	1	2	3	4	5	6	7	8
1. HUSEL	–							
2. GSE	.59**	–						
3. SRAHP	.75**	.68**	–					
4. DASS-Depression	-.37**	-.44**	-.46**	–				
5. HVS	.14	.18*	.27**	-.14	–			
6. MHLC-Internal	.17†	.28**	.27**	-.15	.28**	–		
7. MHCL-Chance	-.10	-.12	-.10	.14	-.03	.19*	–	
8. MHCL-Powerful Others	.11	.07	.10	.11	.07	.32**	.50**	–

*$p < .05$. **$p < .01$. †$p = .06$.

Note. HUSEL = Healthcare Use Self-Efficacy List; GSE = General Self-Efficacy scale; SRAHP = Self-Rated Abilities for Health Practices scale; DASS = Depression, Anxiety, and Stress Scales; HVS = Health Value Scale; MHCL = Multidimensional Health Locus of Control scales

Table 7

Intercorrelations of Variables in Regression Analyses (N = 131)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. HUSEL	–													
2. Gender	-.03	–												
3. Age	.06	-.15	–											
4. Health insurance	.28**	-.15	.22*	–										
5. Case management	.15	.06	-.07	.33**	–									
6. SF-12 mental health	.48**	.05	.14	.15	.18*	–								
7. SF-12 physical health	.08	.02	-.11	-.17	-.20*	.01	–							
8. Unmet medical/surgical need	-.26**	.03	-.11	-.27**	.01	-.33**	-.13	–						
9. Unmet mental health need	-.25**	.03	-.03	-.25**	-.08	-.41**	-.16	.55**	–					
10. Unmet prescription need	-.12	<.01	-.07	-.13	-.23**	-.34**	-.17	.42**	.62**	–				
11. Unmet dental need	<.01	-.06	-.07	-.07	.06	-.17	-.09	.27**	.29**	.35**	–			
12. Unmet vision need	-.04	-.27*	.13	-.05	-.19*	-.32**	-.09	.27**	.35**	.39**	.40**	–		
13. Overall unmet need	-.19*	-.08	-.04	-.22*	-.13	-.44**	-.18*	.70**	.79**	.78**	.63**	.67**	–	
14. SRAHP-health practices	.68**	-.09	<.01	.24**	.11	.46**	.10	-.20*	-.16	-.09	.11	-.06	-.12	–
15. Non-urgent care visits	.29**	-.10	.14	.23**	.14	.01	-.13	<.01	.02	-.03	-.07	.03	-.02	.21*

* $p < .05$. ** $p < .01$.

Note. HUSEL = Healthcare Use Self-Efficacy List, SRAHP = Self-Rated Abilities for Health Practices scale

Table 8

Linear Regression Analysis for Non-urgent Ambulatory Care Visits in the Past Year (N = 131)

	B	SE B	β	*t*	R^2	ΔR^2	*F*-change
Step 1: Demographic and healthcare-related variables					.07	.07	2.51*
Age†	-10.99	9.20	-.11	-1.20			
Gender	-.48	.53	-.07	-.84			
Health insurance	.59	.58	.10	1.03			
Case management	.46	.52	.08	.90			
Step 2: HUSEL	.03	.01	.24	2.69**	.13	.05	7.23**

*$p < .05$. **$p < .01$.

†Inverse square root transformation used

Table 9
Linear Regression Analysis for Incremental Validity (N = 131)

	B	SE B	β	*t*	R^2	ΔR^2	*F*-change
Step 1: SRAHP-Health Practices	.01	.05	.03	.25	.04	.04	5.87*
Step 2: HUSEL	.03	.01	.27	2.35*	.08	.04	5.54*

*$p < .05$.

Table 10
Logistic Regression Analysis for Unmet Medical/surgical Need (N = 131)

					95% CI for Exp(B)	
	B	SE B	Wald	*Exp(B)*	Lower	Upper
Step 1: Demographic and health-related variables						
Age	-.01	.02	.49	.99	.96	1.02
Gender	-.15	.43	.12	.86	.37	2.01
Health insurance	-1.35	.48	7.64**	.26	.10	.68
Case management	.57	.44	1.63	1.76	.74	4.21
SF-12 Physical Health	-.04	.02	3.27	.96	.92	1.00
Step 2: HUSEL	-.02	.01	3.88*	.98	.97	1.00

*$p < .05$. **$p < .01$.

Table 11
Logistic Regression Analysis for Unmet Mental Healthcare Need (N = 131)

					95% CI for Exp(B)	
	B	SE B	Wald	*Exp(B)*	Lower	Upper
Step 1: Demographic and health-related variables						
Age	.01	.02	.68	1.01	.97	1.04
Gender	.09	.44	.04	1.09	.53	2.26
Health insurance	-1.07	.48	4.85*	.35	.16	.76
Case management	.31	.43	.49	1.36	.66	2.77
SF-12 Mental Health	-.09	.02	13.65**	.92	.88	.95
Step 2: HUSEL	>.01	.01	.05	1.00	.98	1.01

*$p < .05$. **$p < .01$.

Table 12
Linear Regression Analysis for Overall Unmet Healthcare Need (N = 131)

	B	SE B	β	*t*	R^2	ΔR^2	*F*-change
Step 1: Demographic and health-related variables					.26	.26	7.30**
Age†	-.54	5.27	-.01	-.10			
Gender	-.30	.30	-.08	-1.01			
Health insurance	-.84	.33	-.23	-2.54*			
Case management	-.05	.30	-.01	-.16			
SF-12 Physical health	-.04	.01	-.22	-2.76**			
SF-12 Mental health	-.07	.02	-.46	-5.08**			
Step 2: HUSEL	.01	.01	.12	1.34	.28	.01	1.79

*$p < .05$. **$p < .01$.
†Inverse square root transformation used

Table 13
Linear Regression Analysis for Perceived Mental Health Status (N = 131)

	B	SE B	β	*t*	R^2	ΔR^2	*F*-change
Step 1: Demographic and health-related variables					.06	.06	1.80
Age†	-44.44	32.23	-.11	-1.38			
Gender	1.65	1.85	.07	.88			
Health insurance	-1.09	2.04	-.05	-.54			
Case management	2.75	1.80	.13	1.53			
Step 2: HUSEL	.23	.04	.48	5.87**	.26	.21	34.42**

*$p < .05$. **$p < .01$.
†Inverse square root transformation used

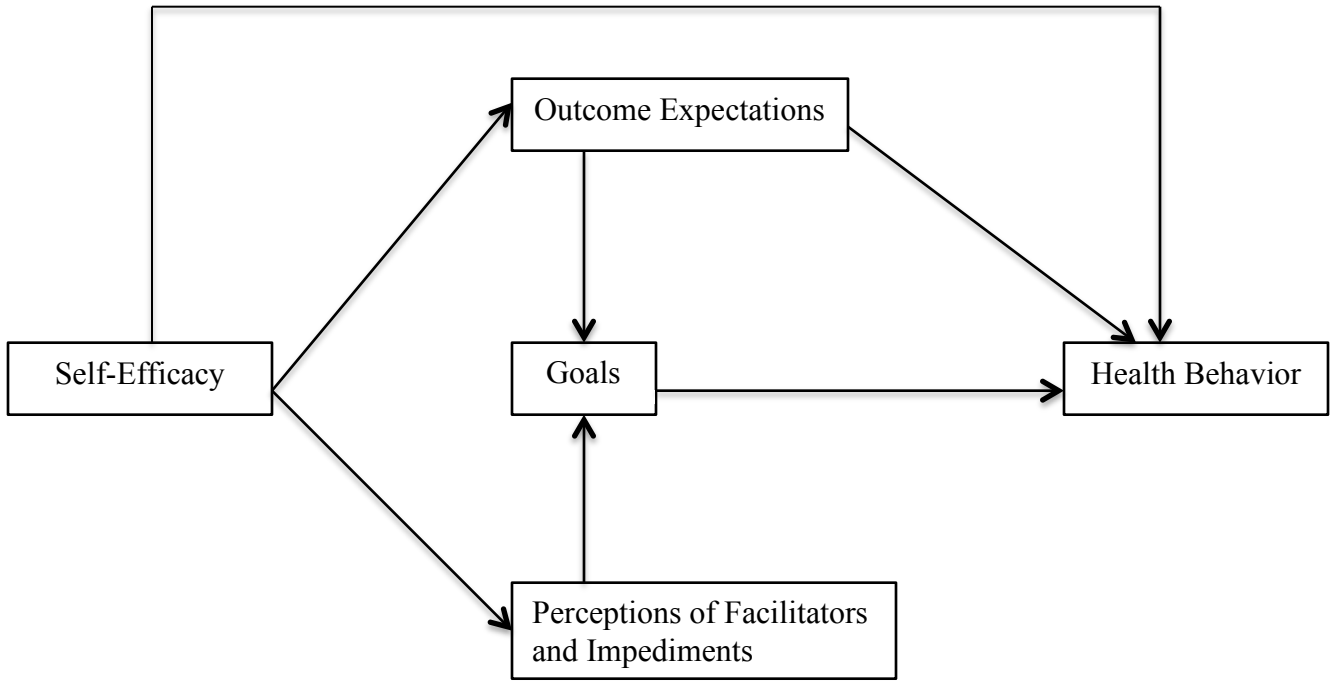


Figure 1. Role of Self-Efficacy in Social Cognitive Theory

Note. Original figure in Bandura, 2004

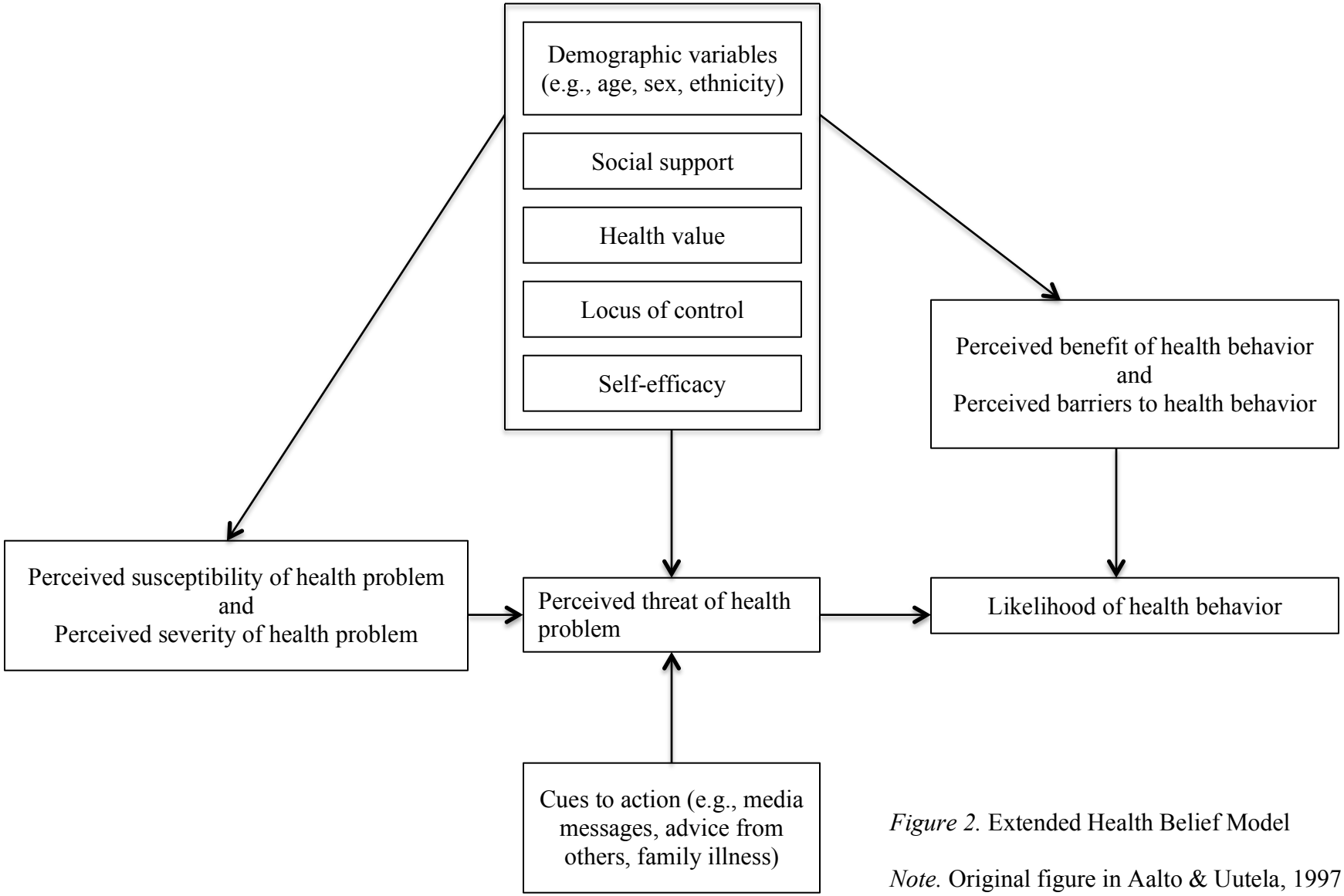


Figure 2. Extended Health Belief Model

Note. Original figure in Aalto & Uutela, 1997

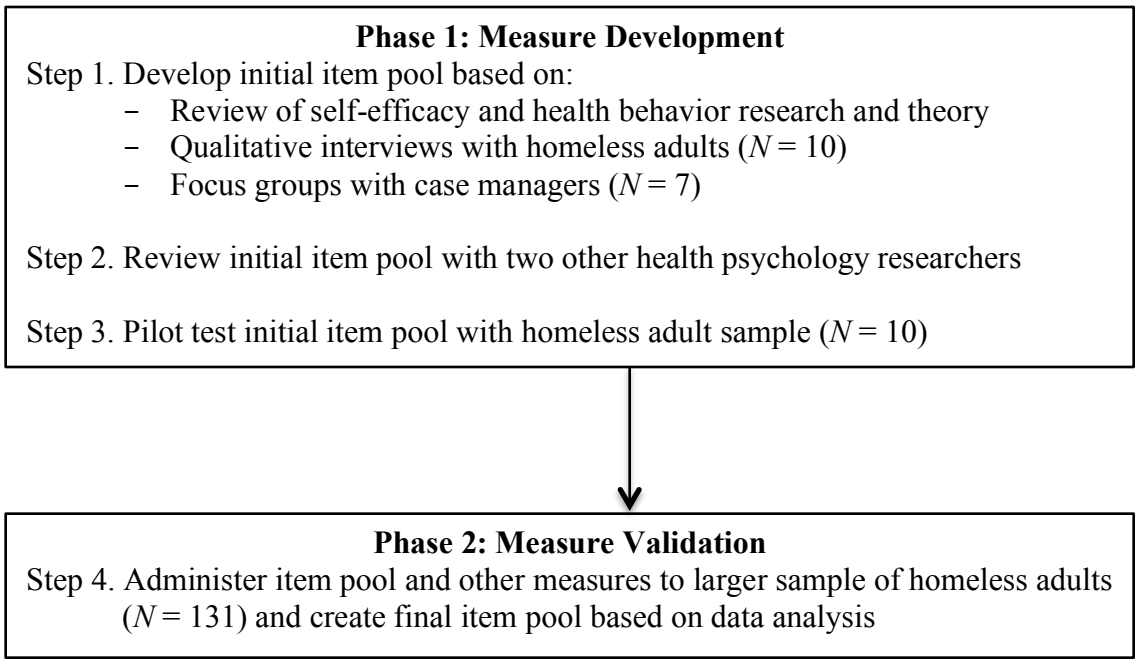


Figure 3. Study Procedures Diagram

Appendix A

Semi-Structured Interview Schedule

- Demographics assessment
  - Age, race/ethnicity, gender, marital status, number of children, homeless status, employment history, education history, amount of time at Places for People
- Health care use behaviors and self-efficacy assessment
  - In the last year, how many times have you received urgent care (emergency dept.) / non-urgent ambulatory care / inpatient care / preventative care / dental and vision care?
  - What prompted those visits?
  - What was helpful about the care?
  - What was unhelpful?
  - Have any of your health care needs gone unmet?
  - How do you decide to seek health care services? What makes those decisions complicated? What do you do if you're unsure about whether to seek care?
  - What things get in the way of getting the care you need?
  - What are you able to do when things get in the way of your health care? What's worked in the past?
  - How confident are you that you're able to overcome barriers that get in the way of health care?
  - What strengthens your confidence in your ability to get health care?
  - What hurts your confidence in your ability to get health care?

Focus Group Schedule

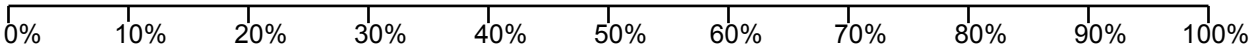
- Introduction. Explain study and concept of healthcare use self-efficacy.
- Client healthcare use behavior and self-efficacy assessment.
  - What kind of health care needs do your clients present with? How severe are those needs?
  - What obstacles to health care services have you observed in your clients?
  - How have your clients overcome those barriers independently?
  - How do you help your clients to overcome those barriers?
  - Do you feel that your clients are confident in their ability to utilize health care services?
  - How does that confidence (or lack of confidence) affect healthcare use decisions and behaviors?
- Conclusion. Summary, thanks, and debriefing.

Appendix B

Healthcare Use Self-Efficacy List (HUSEL)

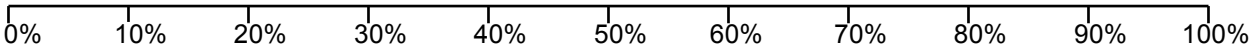
PLEASE READ: These questions ask about whether you believe you are capable of tasks related to health care services. When we say "health care services" we mean any type of care you get from a doctor, nurse, dentist, eye doctor, psychologist, psychiatrist, specialist, or any other health professional. Please read each question and use the scale to indicate **how confident you are that you can do that task now**, not how confident you are that you will do it in the future. Circle the number that best describes your level of confidence.

0. How confident are you that you can answer the following questions?

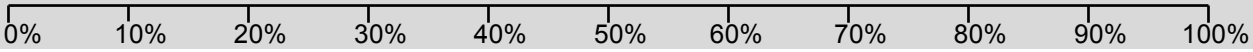


0% = zero confidence (cannot do at all)
50% = medium confidence (moderately certain can do)
100% = full confidence (highly certain can do)

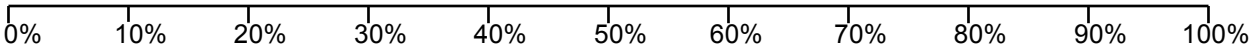
1. How confident are you in your ability to cope with a very long wait time at a clinic or doctor's office?



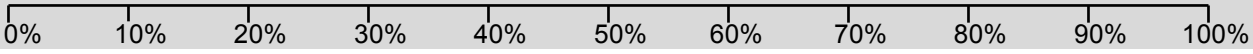
2. How confident are you in your ability to get transportation to your doctor's appointments?



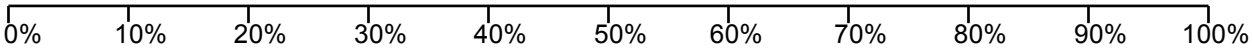
3. How confident are you in your ability to get health care services when you feel irritable or agitated?



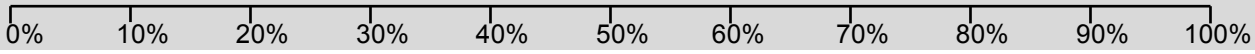
4. How confident are you that you can overcome the difficulty of having a doctor that seems rushed?



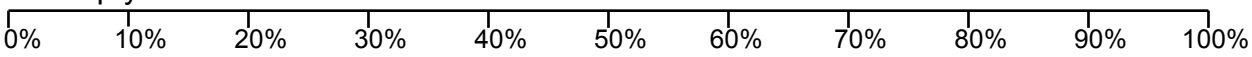
5. How confident are you that you can get to your doctor's appointment if you are in pain?



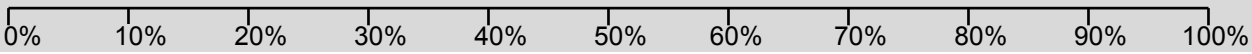
6. How confident are you that you can manage the stress of getting health care services?



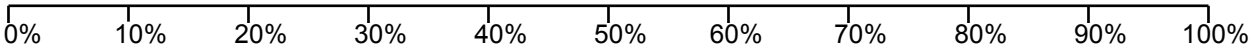
7. How confident are you in your ability to get health care services if there's no one to help you?



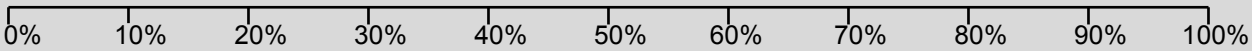
8. How confident are you in your ability to get health care services when life gets really hard?



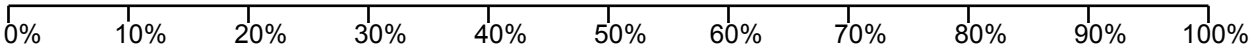
9. How confident are you in your ability to find affordable health care services?



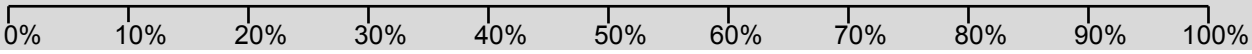
10. How confident are you in your ability to get health care services when you just don't feel like it?



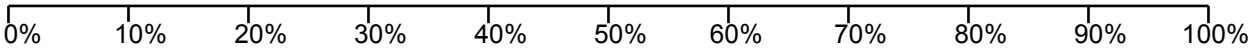
11. How confident are you that you can figure out where to get health care services?



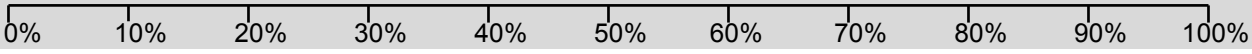
12. How confident are you that you can recognize when a health problem requires professional attention?



13. How confident are you in your ability to ask questions to a doctor?



14. How confident are you that you can seek out information about where to get health care services?



15. How confident are you that you can take steps to get preventative care (wellness check-ups, flu-shots, etc.)?