Journal of the
American Association of Nurse Practitioners

ORIGINAL RESEARCH

Influence of lifestyle, health behavior, and health indices on the health status of underserved adults

Theresa A. Kessler, PhD, RN, ACNS-BC, CNE (Professor) **& Elise M. Alverson,** DNP, RN, FNP-BC, CNE (Associate Professor)

Valparaiso University, Valparaiso, Indiana

Keywords
Adults; health; lifestyle; underserved; outcomes.

Correspondence
Theresa A. Kessler, PhD, RN, ACNS-BC, Valparaiso University, Valparaiso, IN 46383.
Tel: 219-464-5289; Fax: 219-464-5425;
E-mail: terry.kessler@valpo.edu

Received: July 2011;
accepted: January 2012

doi: 10.1002/2327-6924.12027

Abstract

Purpose: To examine how lifestyle, health behavior, and health indices best predict health status in underserved adults.
Data sources: Eighty-four underserved adults from a nurse-managed center completed an investigator-developed instrument to measure lifestyle, health behavior, and health indices. The SF-12 Health Survey measured general (SF-1), physical (PCS), and mental (MCS) health status.
Conclusions: The majority of the sample was female (64%). Sixty-three percent were at or below 200% of the federal poverty level. For nonsmokers, five independent variables accounted for 47.1% of the variance in SF1 ($p < .000$), 33.5% in PCS-12 scores ($p < .001$), and 23.2% in MCS-12 scores ($p = .017$). For smokers, six variables accounted for 48.7% of the variance in SF1 ($p = .024$), 41.7% in PCS-12 scores ($p = .067$), and 25.4% in MCS-12 scores ($p = .378$).
Implications for practice: Findings provide partial support for the impact of lifestyle and health behaviors on health status outcomes. Focusing concurrent interventions on improving multiple behaviors may have the greatest impact on health status outcomes.

The quality of a person's day-to-day life is an important indicator of health status (U.S. Department of Health and Human Services [HHS], 2010). Over the past 20 years, considerable effort has been devoted to the measurement of health status as an outcome of public health and clinical indicators. Health status is a result of a person's lifestyle, which includes health behaviors (Bruhn, 1988) and is equated with health-related quality of life (HRQL). HRQL refers to a person's perception of physical and mental health status over time (Centers for Disease Control and Prevention [CDC], 2009). Knowing an individual's health status or HRQL offers healthcare providers important information about the impact of lifestyle, health behaviors, and health care on increasing quality and years of life.

Tracking health status in diverse populations can help identify groups who have poorer physical or mental health. One group of adults who tend to report poorer physical and mental health status is those with a low income. Unfortunately, adults with low income also tend to be underserved. The underserved include those who are uninsured, underinsured, or uninsurable and have difficulty finding access to health care (Beauchamp & Childress, 2009). Having a limited access to health care results in the underserved having poorer health outcomes and increased mortality rates compared to persons who are insured (Institute of Medicine [IOM], 2004).

How a person manages day-to-day life can be reflected in overall health status. Identifying those persons with poor physical or mental health status can guide policies and interventions to improve health (CDC, 2009). To achieve this goal, the aim of this secondary analysis was to identify the predictors of health status for underserved adults seeking care at a nurse-managed health center. This information may be used to provide better health promotion guidance and to design interventions that have the greatest impact on improving overall health for the underserved.

Framework

According to Bruhn (1988), multiple influences including cultural, environmental, social, and personal factors impact the development of lifestyle. Lifestyle is a broad

Journal of the American Association of Nurse Practitioners 25 (2013) 674–681

term that equates with a person's behaviors, attitudes, and outlook or philosophy of life. Lifestyle is acquired and changes over time. Health behaviors, as part of lifestyle, include actions and/or inactions that directly or indirectly affect health status. Because a healthy lifestyle or health behaviors are not always systematically taught, learned unhealthy behaviors take considerable effort to modify. Positive factors such as a consistent healthcare provider can facilitate and promote healthy behaviors. Because little or no encouragement from the provider can deter change, healthcare providers must consistently encourage the adoption of a healthy lifestyle and health behaviors.

Lifestyle, health behavior, and health status

Health status is multidimensional and includes physical, mental, and social well-being and not merely the absence of disease or illness in an individual. It is dependent on a person's perception of health and health behaviors. When examining the health status of the underserved, these adults typically report poorer health status as compared to the general adult population (Alverson & Kessler, 2012; Bharmel & Thomas, 2005; Salsberry et al., 1999; Schrop et al., 2006). Adults with the lowest income or education reported more unhealthy days than did those with higher income or education (CDC, 2009). Having a poorer health status impacts day-to-day life and may interfere with the ability to work and carry on daily activities.

Common unhealthy lifestyle behaviors of cigarette smoking, physical inactivity, higher alcohol consumption, and poor dietary practices often lead to increased mortality and morbidity (Kvaavik, Batty, Ursin, Huxley, & Gale, 2010; van Dam, Li, Spiegelman, Franco, & Hu, 2008). In addition, use of tobacco, eating a high-fat diet, and being physically inactive contribute the most to chronic disease and mortality in the United States (CDC, 2010). Often times, studies report the effect of a single lifestyle behavior rather than the combined effect of multiple behaviors on increased risk of cardiovascular disease, cancer, and mortality (Kvaavik et al., 2010). Hence, it is more difficult to identify how a combination of day-to-day actions affects a person's health status.

In a European prospective study of nearly 8 years, four factors were examined for their effect on chronic diseases (Ford et al., 2009). The four factors of never smoking, engaging in physical activity, having a body mass index (BMI) less than 30, and eating a healthy diet led to a lower risk of developing various chronic diseases such as diabetes, cancer, and heart disease. In a U.S. study, an increased number of behaviors related to smoking, eating a poor nutritional diet, being inactive, and consuming greater amounts of alcohol led to increased mortality (Kvaavik et al., 2010).

While some studies have found that unhealthy lifestyle behaviors were related to health status outcomes in various populations, no studies consistently report the effect of lifestyle or health behaviors on the health status of the underserved. What is known is that persons who are underserved often engage in unhealthy behaviors; however, how these behaviors impact health status is not known. The underserved tend to report an increased rate of smoking (CDC, 2008b; Schrop et al., 2006), an increased consumption of alcohol (CDC, 2008b), and a failure to engage in leisure time physical activity (CDC, 2008b). For health behaviors such as participating in screening behaviors or taking prescribed medications, data support the fact that the underserved tend to engage in screening behaviors less frequently than the general population (Alverson & Kessler, 2012; CDC, 2008a). For prescribed medication usage, the underserved tend to use fewer prescription medications when needed than the general population (U.S. Census Bureau, 2006). These lower rates of screening practices and use of prescription medications may be directly related to a lack of access to health care. Few researchers have examined the effects of these health behavior actions or inactions on health status. In one study, taking prescribed medications was inversely related to measures of health status, while engaging in recommended screening behaviors was not related to health status outcomes (Alverson & Kessler, 2012).

Factors found to provide a greater link with health status include those related to illness such as having an increased BMI (Alverson & Kessler, 2012; Ford et al., 2009), being diagnosed with acute and/or chronic medical conditions, and experiencing daily symptoms (Alverson & Kessler, 2012). According to the literature, those with lower income levels are less likely to be at a healthy weight compared to the general population (CDC, 2008b; Larson, Schlundt, Patel, Beard, & Hargreaves, 2008). In one study, 72% of underserved adults reported at least one persistent or chronic medical condition, and 89% reported at least one current symptom related to illness (Alverson & Kessler, 2012). Overall, these health indices impact both physical and mental components of health status on a daily basis.

Based on previous research, multiple lifestyles, health behaviors, and health indices are believed to influence health status (Alverson & Kessler, 2012). Thus, the specific research question for this secondary analysis was: what are the lifestyles, health behaviors, and health indices that best predict health status in underserved adults?

Method

Design

For this predictive study, a secondary analysis was completed on data regarding lifestyle and health behaviors among underserved adult clients seen at a nurse-managed center in a single county in the Midwest. The nurse-managed health center was established to provide holistic care to underserved adults who previously did not have access to primary health care. The original study used a cross-sectional, correlational design. Approval to conduct the study was obtained from the Institutional Review Board (IRB). A nonprobability, convenience sample of 84 underserved adults was recruited. Clients were invited to participate in the study if they were (a) adults seen at the health center, (b) age 18 and older, and (c) able to read and speak English.

Procedures

Data from the original study were collected using two instruments. The Short Form-12 (SF-12), a self-report measure of health status, is a shortened version of the Medical Outcomes Study SF-36 questionnaire (Ware, Kosinski, & Keller, 1996). The SF-12 contains a single item measuring general health status (SF1) and 11 items with forced choice response options measuring physical (PCS-12) and mental component summary (MCS-12) health status. The single-item SF1 asks: "In general, would you say your health is: excellent, very good, good, fair or poor"? PCS-12 measures attributes of health related to physical functioning, role limitations as a result of physical health problems, bodily pain, energy and fatigue, and MCS-12 measures attributes of social and role limitations related to emotional problems and mental health distress (Ware et al., 1996). Higher scores represent better mental and physical health status. The SF-12 has been used in a variety of studies and has support for reliability and validity (Adams et al., 2006; Bharmal & Thomas, 2005; Cockerill et al., 2004; Mainous, Griffith, & Love, 1999; Resnick, 2002; Salsberry et al., 1999; Schrop et al., 2006; Ware et al., 1996). The Cronbach's alpha in this sample was 0.88.

The Hilltop General Health Survey (HGHS) is a self-report instrument developed by the research team to assess demographic information, lifestyle, and health behaviors (Alverson & Kessler, 2012). The instrument includes both open- and closed-ended items. Fitting with Bruhn's (1988) framework, questions focus on behaviors that make up a person's lifestyle and include actions or inactions that may affect health status. Items include questions related to tobacco usage, substance abuse, exercise patterns, health screening behaviors, current symptoms, and the diagnosis of acute or chronic medical conditions. Two advanced practice nurses (APNs) who have experience working with the underserved evaluated the instrument for face validity during its initial use.

On randomly selected days over a period of 4 months, research assistants approached potential subjects while they were waiting for their appointments at the nurse-managed center. Subjects agreeing to participate completed the questionnaires in approximately 15 min. The overall response rate was 97%.

Data analysis

Data were entered into SPSS-Version 18 and checked for accuracy. Normality of data was examined before performing statistical analysis. Based on the initial analysis of the data, a total of six predictors: lifestyle (hours of sleep and smoking/packs per day), health behavior (number of prescription medications), and health indices (number of medical conditions, BMI, and number of symptoms) were targeted and entered into the regression equation (Kessler & Alverson, 2012). Previous studies also found these same factors were related to health status (Kroenke, Kubzanski, Adler, & Kawachi, 2008; Larson et al., 2008; Zanjani, Warner, & Willis, 2006).

A commonly related lifestyle behavior of exercise was not entered into this analysis because of concerns with validity of the findings from the original study (Alverson & Kessler, 2012). In the initial study, 45% of the underserved subjects reported engaging in some type of exercise, most frequently walking. However, the researchers found that the subjects had a broad interpretation of exercise; subjects reported minimal daily walking at home or work as exercise. When the data related to exercise frequency were analyzed, there were weak negative correlations between exercise frequency and health status outcomes. In addition, the relationship between exercise and BMI was positive, which added to the concerns about the measurement validity of exercise.

Simultaneous multiple regression was used to examine these predictors of health status because both lifestyle and health behaviors are of comparable importance to daily health status (Polit & Beck, 2008). Pearson's correlations amongst the predictors were calculated to assess for multicollinearity (Field, 2009). In addition, tolerance and variance inflation factor (VIF) statistics were calculated to assess for multicollinearity (Field, 2009). The level of significance was set at $p < .05$ and two-tailed tests were used. A power analysis was calculated to assess the risk of a Type II error. This analysis is useful in describing "after-the-fact" sample results (Polit & Beck, 2008). Based on the number of subjects in the original study, this secondary analysis had a power level greater than 0.70.

Table 1 Sample characteristics

	All participants, $N = 84$		
Variable	%	Mean (*SD*)	Range
Gender			
Male	33.3		
Female	64.3		
Missing	2.4		
Age (years)		38.9 (12.23)	19–64
Ethnicity			
African American	0		
Asian	1.2		
Hispanic	3.6		
Other	1.2		
White	91.6		
Missing	2.4		
Income			
<1999	17.9		
2–3999	8.2		
4–5999	6.0		
6–7999	7.1		
8–9999	17.9		
10–25,000	36.9		
Missing	6.0		
Education level		12.46 (1.76)	8–17
Smoking packs/day		0.86 (0.32)	1/2–2
Hours of sleep/day		7.16 (1.87)	3–13
Number of prescription medications		1.89 (2.33)	1–12
BMI		29.29 (7.87)	18–54.8
Number of medical conditions		1.72 (1.75)	0–8
SF1		2.9 (0.94)	1–5
PCS-12		42.26 (10.91)	20.70–62.38
MCS-12		41.50 (13.25)	10.96–64.15

Note. BMI, body mass index; SF1, Short Form 1; PCS, physical component summary; MCS, mental component summary.

According to Polit and Beck (2008), most researchers have a power level well below 0.80 because of sample size limitations.

Results

The demographic characteristics of the sample are displayed in Table 1. The demographic data were consistent with the total population seeking care at this nurse-managed health center. The majority of subjects (63%) who reported their income indicated that they were at or below 200% of the federal poverty level (HHS, 2011). The primary language of this sample was English (98%). The remaining 2% spoke Spanish as their primary language. For lifestyle behaviors, 44% of the subjects smoked and had an average of 7 h of sleep per night (see Table 1). For health behaviors, 61% used at least one prescription medication. Overall, the subjects were overweight with an average BMI of 29.29. Eighty-seven percent of the subjects identified at least one symptom, such as depression, nervousness, joint pain, or bowel changes. Seventy-two percent reported at least one current acute or chronic diagnosed medical condition for which they were seen at the nurse-managed center. The top five reported medical conditions included mental health issues (37%), hypertension (25%), "stomach problems" such as gastroenteritis and gastroesophageal reflux disease (22%), menstrual changes (20%), and diabetes mellitus (17%). For health status outcomes, the mean SF1 score was 2.9 ($SD = 0.94$), PCS-12 was 42.26 ($SD = 10.91$), and MCS-12 was 41.50 ($SD = 13.25$).

Predictors of health status outcomes

Two regression models were tested for lifestyle, health behavior, and health indices depending on whether the subject smoked. The intercorrelations of these independent variables ranged from 0.003 to 0.741 suggesting lack of multicollinearity (see Table 2). Tolerances were > 0.1 and VIFs were all below 10 further indicating lack of multicollinearity (Field, 2009; Hair, Anderson, Tathan, & Black, 2006). For the nonsmokers, the independent variables accounted for 47.1% of the variance in SF1, a measure of general health status ($F = 9.625$, $df = 5, 51$, $p < .000$), 33.5% of the variance in PCS-12 ($F = 5.140$, $df = 5, 51$, $p < .001$), and 23.2% of the variance in MCS-12 ($F = 3.085$, $df = 5, 51$, $p = .017$) (see Table 3). For the subjects who smoked ($n = 27$), the independent variables accounted for 48.7% of the variance in SF1 ($F = 3.166$, $df = 6, 20$, $p = .024$), 41.7% of the variance in PCS-12 ($F = 2.383$, $df = 6, 20$, $p = .067$), and 25.4% of the variance in MCS-12 ($F = 1.136$, $df = 6, 20$, $p < .378$). For the nonsmokers, number of medical conditions was a single significant predictor of SF1 and PCS-12, and number of symptoms was a single significant predictor of MCS-12. For those who smoked, smoking was not a single significant predictor of health status outcomes (see Table 3).

Discussion

In this sample of underserved adults, the selected lifestyle behaviors, health behaviors, and health indices were determinants of variations in health status outcomes. For the nonsmokers, the combination of hours of sleep, number of prescription medications, along with medical conditions, BMI, and number of symptoms significantly contributed to the model's ability to predict general, physical, and mental health status. Previous studies have similar findings. Health status or HRQL was found to be negatively affected by poor lifestyle

Table 2 Pearson's correlation matrix ($N = 60$)

Variable	1	2	3	4	5	6	7	8	9
1. Hours of sleep	–								
2. Packs smoked ($n = 27$)	0.003	–							
3. Prescription meds	−0.232	−0.182	–						
4. BMI	−0.277	−0.082	0.246	–					
5. Total symptoms	−0.149	−0.066	0.674**	0.407**	–				
6. Medical conditions	−0.019	−0.161	0.731**	0.450**	0.741**	–			
7. SF1	0.175	0.035	−0.583**	−0.369**	−0.588**	−0.642**	–		
8. PCS	0.143	0.178	−0.436**	−0.396**	−0.413**	−0.545**	0.547**	–	
9. MCS	0.147	0.045	−0.364**	−0.231	−0.442**	−0.306*	0.426**	0.155	–

Note. BMI, body mass index; SF1, Short Form 1; PCS, physical component summary; MCS, mental component summary.
*$p < .05$, **$p < .01$.

Table 3 Multiple regression of predictors for health status

	SF1		PCS		MCS	
Predictor	β	p	β	p	β	p
Nonsmoker ($n = 57$)						
Sleep	0.125	0.219	0.135	0.253	0.073	0.561
Medications	0.010	0.956	0.166	0.595	−0.299	0.206
Medical conditions	−0.416	0.050*	−0.580	0.024*	−0.310	0.253
BMI	−0.145	0.220	−0.156	0.250	−0.072	0.617
Symptoms	−0.210	0.172	0.026	0.882	−0.431	0.028*
Smoker ($n = 37$)						
Sleep	0.256	0.162	−0.045	0.812	0.227	0.300
Medications	−0.216	0.459	0.065	0.837	−0.362	0.307
Medical conditions	−0.415	0.170	−0.427	0.184	−0.323	0.269
BMI	−0.050	0.800	−0.405	0.067	−0.113	0.637
Symptoms	−0.005	0.988	0.074	0.819	−0.206	0.575
Packs	−0.068	0.684	0.164	0.364	0.008	0.967

Note. BMI, body mass index; SF1, Short Form 1; PCS, physical component summary; MCS, mental component summary.
*$p \leq .05$.

and health behaviors (Borzecki, Lee, Kalman, & Kazis, 2005; Katz, McHorney, & Atkinson, 2000). The difference in explained variance between PCS (33.5%) and MCS (23.2%) scores was not surprising, because most of the independent variables entered into the regression model are linked more strongly with physical aspects of health such as pain, fatigue, and role limitations (Ware et al., 1996).

The lifestyle behavior of smoking, measured by packs per day, added limited explanatory power to the second regression model. Even though the model significantly predicted general health status, smoking only explained an additional 1.6% of variance in SF1 scores. Furthermore, smoking did not add significant explanatory power to PCS or MCS scores even though this lifestyle behavior added 8.2% of the variance in PCS scores and 2.2% of the variance in MCS scores. This finding was similar to Kroenke and colleagues (2008), who found quitting smoking was not related to improvements in HRQL. However, for this sample, smoking did add a larger percent of explained variance in PCS scores. Borzecki et al. (2005) found smoking status made a significant contribution to HRQL in a sample of male veterans. However, never smokers had significantly higher PCS scores. The lack of consistent findings related to the lifestyle impact of smoking on health status warrants further examination.

The lifestyle behavior of sleep was associated with health status outcomes in the initial study (Alverson & Kessler, 2012). On average, the underserved adults in this sample were getting 7 h of sleep each night; those subjects who were getting less sleep had lower SF1 scores. Seven to 8 h of sleep is considered an essential component of a healthy lifestyle. However, no studies were found linking sleep with health status in the general population or the underserved.

When looking at the three health indices of diagnosed medical conditions, BMI, and current symptoms, the

number of diagnosed medical conditions had the greatest explanatory power for the measure of general health status, especially for the nonsmoker. The underserved in this study reported a variety of acute and chronic diagnosed medical conditions. Identifying the number of diagnosed medical conditions is less subjective than self-reported lifestyle or health behaviors, which are more prone to measurement error and may better reflect current factors affecting daily health. By managing medical conditions over time, health status outcomes may improve regardless of reported lifestyle behaviors.

The number of diagnosed medical conditions and prescription medications used were significantly correlated in this sample. Sixty-one percent of subjects reported taking at least one prescription medication during the previous year. In 2005, 44% of adults with a family income of at least 100% of the poverty level took prescription medications at least once (U.S. Census Bureau, 2006). Often times being diagnosed with medical conditions results in the use of prescription medications, thus, managing or decreasing the number of acute or chronic medical conditions may also lead to less prescription usage. Other studies have failed to report the impact of prescription usage, medical conditions, and symptoms on health status in the general population or the underserved.

In this sample, nearly 50% of the underserved adults had an increased BMI. Previous research has demonstrated that a high BMI and low levels of physical activity are associated with poorer health status, while those who have moderate or vigorous physical activity tended to be less overweight (Jia & Lubetkin, 2005) and perceive a better HRQL (Fontaine, Cheskin, & Barofsky, 1996; Jia & Lubetkin, 2005; Katz et al., 2000; Wendel-Vos, Schuit, Tijhuis, Kromhout, 2004).

Improvements in physical and mental domains of health status are important predictors of mortality (Kroenke et al., 2008) and health status (Borzecki et al., 2005). The findings from this study provide partial theoretical support for the impact lifestyle and health behaviors may have on health status outcomes. The lifestyle behaviors of adequate sleep and smoking, the health behavior of taking prescription medications, and the health indices of number of diagnosed medical conditions, BMI, and number of current symptoms as a group significantly contributed to the ability to predict general health status, PCS, and MCS scores in underserved adults. One independent variable in the model, number of medical conditions, significantly contributed to the variance in health outcomes. This finding fails to support the impact of individual lifestyle and health behaviors as key predictors of health status. However, this finding suggests that a variable related to health indices, such as number of medical conditions, may be a stronger predictor of health status. Another explanation is to consider that the impact of lifestyle and health behaviors on health status is not unidirectional. Maybe having a poorer health status results in individuals getting less sleep, not following a healthy diet, and taking an increased numbers of prescription medications. In addition, the regression models demonstrated that other variables not entered into the analysis contributed more to health status outcomes. Therefore, it is important to do further research on the impact of lifestyle and health behaviors on health status but to consider other variables that impact health status in the underserved.

When comparing the amount of explained variance in all health status outcomes (SF1, PCS, and MCS) for smokers and nonsmokers, a similar pattern of explained variance was obtained. Interestingly, the independent variables were most predictive of the single-item measure of health status (SF1). This finding further supports the potential use of a single item as a clinically useful measure of general health status with the underserved.

An important limitation of this study concerns the generalizability of the results. There were a small number of subjects in the total sample and even fewer numbers of subjects who identified themselves as current smokers impacting the ability to detect the strength of relationships. The subjects were mostly female, white, and middle aged. However, the sample was representative of the clients seen at this nurse-managed center. Having a response rate of 97% helped decrease some of the bias from responders and nonresponders. The underserved adults seen at this nurse-managed center may not be reflective of other underserved adults or the general population. On the other hand, people with a low socioeconomic status tend to have lower HRQL, which was similar to the reported health status of those in this study. The self-report nature of the variables may affect the validity of the findings. However, health status is a self-report measure, and there is no other feasible way to collect most lifestyle and health behavior data.

Implications for practice

Healthcare providers must continuously assess lifestyle, health behaviors, and health indices in the underserved because of their potential impact on health status and mortality. Because the underserved tend to seek care for more episodic health concerns than for health promotion, providing interventions that manage immediate medical conditions may have the greatest impact on health status outcomes. Once improvement occurs, providers should begin to focus on multiple lifestyle behaviors such as

encouraging weight loss, getting adequate sleep, and smoking cessation. Focusing on multiple behaviors at the same time appears to have a greater impact on health status outcomes as compared to focusing on a single behavior.

The use of a single measure of health status, such as the SF1, may provide a clinically valid method of assessing health status. Because the underserved often have limited access to health care and delay seeking medical care, using a single-item measure may be ideal for providers working with the underserved. Being able to capitalize on a measure of health that is simple, quick to use, and provides valid data may be a powerful tool to use when there is limited time and contact with clients.

Because nurse practitioners (NPs) care for a higher proportion of individuals who are underserved (Brown, 2007; Grumbach, Hart, Mertz, Coffman, & Palazzo, 2003) or have no health insurance (Deshefy-Longhi, Swartz, & Grey, 2008; Goolsby, 2005), they are in an ideal position to impact health status outcomes by providing care with a focus on illness and life management (Joanna Briggs Institute, 2006). In a study of low-income women, the subjects believed their primary care NPs were important sources of social support to help them maintain healthy behaviors (Lopez Bushnell, Cook, Wells, & Johnson, 2000). Nurses are on the "front lines" and have close working relationships with individuals where they live (CDC, 2009). As primary care providers, NPs have the ability to impact health status outcomes.

Conclusions

Overall, the underserved adults in this study reported lower health status scores and practiced unhealthy lifestyle and health behaviors. A combination of lifestyle, health behaviors, and health indices impacted physical and mental health status outcomes. The number of diagnosed medical conditions was the single best predictor of health outcomes. Surprisingly, cigarette smoking was not a significant predictor of health status in this sample of underserved adults. However, evidence supports the use of health promotion interventions, such as decreasing smoking behaviors and engaging in exercise, to impact health indices (HHS, 2008; Kroenke et al., 2008; Resnick, 2002).

Managing acute and chronic medical conditions is critical to improving the health of the underserved. Improvements in the other health indices, such as prescription medication usage and/or symptom complaints, should also lead to improved health status outcomes. NPs are in a unique position to assess and design interventions that influence the health status of individuals in underserved populations.

References

Adams, R. J., Wilson, D. H., Taylor, A. W., Daly, A., d'Espaignet, E. T., Dal Grande, E. D., & Ruffin, R. E. (2006). Coexistent chronic conditions and asthma quality of life: A population-based study. *Chest*, **129**, 285–291. doi:10.1378/chest.129.2.285.

Alverson, E. A., & Kessler, T. A. (2012). Relationships between life-style, health behaviors, and health status outcomes for underserved adults. *Journal of the American Academy of Nurse Practitioners*, **24**, 364–374. doi:10.1111/j.1745-7599.2012.00697.x.

Beauchamp, T. L., & Childress, J. F. (2009). *Principles of biomedical ethics* (5th ed.). New York, NY: Oxford University Press.

Bharmal, M., & Thomas, J. (2005). Health insurance coverage and health-related quality of life: Analysis of 2000 medical expenditure panel survey data. *Journal of Health Care for the Poor and Underserved*, **16**, 643–654.

Borzecki, A. M., Lee, A., Kalman, D., & Kazis, L. E. (2005). Do poor health behaviors affect health-related quality of life and healthcare utilized among veterans? *Journal of Ambulatory Care Management*, **28**(2), 141–156.

Brown, D. (2007). Consumer perspectives on nurse practitioners and independent practice. *Journal of the American Academy of Nurse Practitioners*, **19**, 523–529. doi:10.1111/j.1745-7599.2007.00261.x.

Bruhn, J. G. (1988). Life-style and health behavior. In D. S. Gochman (Ed.), *Health behavior emerging research perspectives* (pp. 71–86). New York, NY: Plenum Press.

Centers for Disease Control. (2008a). *Behavioral risk factor surveillance system survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from http://www.cdc.gov/brfss/pubs/index.htm

Centers for Disease Control. (2008b). *Healthy people 2010 database*. Retrieved from http://wonder.cdc.gov/data2010/focreceg.htm

Centers for Disease Control & Prevention. (2009). *Health-related quality of life*. Retrieved from http://www.cdc.gov/hrqol/

Centers for Disease Control & Prevention. (2010). *Healthy communities preventing chronic disease by activating grassroots change: At a glance 2010*. Retrieved from http://www.cdc.gov/chronicdisease/resources/publications/aag/healthy_communities.htm

Cockerill, W., Lunt, M., Silman, A., Cooper, C., Lips, P., Bhalla, A., … Gennari, C. (2004). Health related quality of life and radiographic vertebral fracture. *Osteoporosis International*, **15**, 113–119. doi:10.1007/s00198-003-1547-4.

Deshefy-Longhi, T., Swartz, M., & Grey, M. (2008). Characterizing nurse practitioner practice by sampling patient encounters: An APRNet study. *Journal of the American Academy of Nurse Practitioners*, **20**, 281–287. doi:10.1111/j.1745-7599.2008.00318.x.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Los Angeles, CA: Sage.

Fontaine, K. R., Cheskin, L. J., & Barofsky, I. (1996). Health related quality of life in obese persons seeking treatment. *Journal of Family Practice*, **43**, 265–270.

Ford, E. S., Bergmann, M. M., Kröger, J., Schienkiewitz, A., Weikert, C., & Boeing, H. (2009). Healthy living is the best revenge: Findings from the European prospective investigation into cancer. *Archives of Internal Medicine*, **169**, 1355–1362.

Goolsby, M. (2005). 2004 AANP National Nurse Practitioner Sample Survey Part I: An overview. *Journal of the American Academy of Nurse Practitioners*, **17**, 337–341.

Grumbach, K., Hart, L., Mertz, E., Coffman, J., & Palazzo, L. (2003). Who is caring for the underserved? A comparison of primary care physicians and nonphysician clinicians in California and Washington. *Annals of Family Medicine*, **1**, 97–104.

Hair, J., Anderson, E., Tathan, R., & Black, W. (2006). *Multivariate data analysis* (6th ed.). Englewood Cliffs, NJ: Prentice-Hall.

Institute of Medicine Committee on the Consequences of Uninsurance. (2004). *Insuring American's health: Principles and recommendations*. Retrieved from http://books.nap.edu/html/insuring_health/reportbrief.pdf

Jia, H., & Lubetkin, E. I. (2005). The impact of obesity on health-related quality-of-life in the general adult population. *Journal of Public Health*, **27**, 156–164. doi:10.1093/pubmed/fdi025.

Joanna Briggs Institute. (2006). Nurse-led cardiac clinics for adults with coronary heart disease. *Nursing Standard*, **20**(28), 46–50.

Katz, D. A., McHorney, C. A., & Atkinson, R. L. (2000). Impact of obesity on health-related quality of life in patients with chronic illness. *Journal of General Internal Medicine*, **15**, 789–796. doi:10.1046/j.1525-1497.2000.90906.x.

Kroenke, C. H, Kubzanski, L. D., Adler, N., & Kawachi, I. (2008). Prospective change in health-related quality of life and subsequent mortality among middle-aged and older women. *American Journal of Public Health*, **98**, 2085–2091. doi:10.2105/AJPH.2007.114041.

Kvaavik, E., Batty, D., Ursin, G., Huxley, R., & Gale, C. R. (2010). Influence of individual and combined health behaviors on total and cause-specific mortality in men and women. *Archives of Internal Medicine*, **170**, 711–718.

Larson, C.O., Schlundt, D., Patel, K., Beard, K., & Hargreaves, M. (2008). Validity of the SF-12 for use in a low-income African American community-based research initiative (REACH 2010). *Preventing Chronic Disease Public Health Research Practice, and Policy*, **5**(2), 1–14.

Lopez Bushnell, F. K., Cook, T. H., Wells, N., & Johnson, R. (2000). The meaning of health to low-income patients in a primary care center. *Journal of Health Care for the Poor and Underserved*, **11**, 267–275.

Mainous, A. G., Griffith, C. H., & Love, M. M. (1999). Patient satisfaction with care in programs for low income individuals. *Journal of Community Health*, **24**, 381–391. doi:10.1023/A:1018786320806.

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins.

Resnick, B. (2002). Testing the effect of WALC intervention on exercise adherence in older adults. *Journal of Gerontological Nursing*, **28**(6), 40–49.

Salsberry, P. J., Nickel, J. T., Polivka, B. J., Kuthy, R. A., Slack, C., & Shapiro, N. (1999). Self-reported health status of low-income mothers. *Image: Journal of Nursing Scholarship*, **31**, 375–380. doi:10.1111/j.1547-5069.1999.tb00523.x.

Schrop, S. L., Pendleton, B. F., McCord, G., Gil, K. M., Stockton, L., McNatt, J., & Gilchrist, V. J. (2006). The medically underserved: Who is likely to exercise and why? *Journal of Health Care for the Poor and Underserved*, **17**, 276–289.

U.S. Census Bureau. (2006). *Health status, health insurance, and health services utilization: 2001*. Retrieved from http://www.census.gov/prod/2006pubs/p70–106.pdf

U.S. Department of Health and Human Services. (2008). *Treating tobacco use and dependence: 2008 update*. Washington, DC: Author. Retrieved from http://www.surgeongeneral.gov/tobacco/treating_tobacco_use.pdf

U.S. Department of Health and Human Services. (2010). *Healthy people 2020*. Retrieved from http://www.healthypeople.gov/2020/about/QoLWBabout.aspx

U.S. Department of Health and Human Services. (2011). *Poverty thresholds 2008*. Retrieved from http://www.census.gov/hhes/www/poverty/data/threshld/thresh08.html

van Dam, R. M., Li, T., Spiegelman, D., Franco, O. H., & Hu, f. B. (2008). Combined impact of lifestyle factors on mortality: Prospective cohort study in US women. *British Medical Journal*, **337**, 742–745. doi:10.1136/bmj.a1440.

Ware, J. E., Kosinski, M., & Keller, S. D. (1996). A 12-item short-form health survey construction of scales and preliminary tests of reliability and validity. *Medical Care*, **34**, 220–233.

Wendel-Vos, G. C., Schuit, A. J., Tijhuis, M. A., & Kromhout, D. (2004). Leisure time physical activity and health-related quality of life: Cross-sectional and longitudinal associations. *Quality of Life Research*, **13**, 667–677. doi:10.1023/B:QURE.0000021313.51397.33.

Zanjani, F. A., Warner, S., & Willis, S. L. (2006). Age group and health status effects on health behavior change. *Behavioral Medicine*, **32**(2), 36–46.