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Impact of Nursing Intervention on Improving HIV, Hepatitis Knowledge and Mental Health among Homeless Young Adults

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Abstract

In a prospective two-group pilot study of a convenient sample of 156 young adults, we assessed improvement in HIV cognitive and transmission knowledge, hepatitis knowledge, and mental health at six-month follow-up. Multiple linear regression analysis revealed higher six-month scores in total HIV/AIDS knowledge, HIV/AIDS cognitive knowledge, HIV transmission knowledge, and HBV and HCV knowledge at six months in the Hepatitis Health Promotion (HHP) group compared to the Art Messaging (AM) group. Moreover, homeless young participants who reported having significant others in their lives, and excellent or very good health did better than their counterparts. Youth who were attempting to get their lives together had higher scores for all types of knowledge except HBV. Hallucinogen users had significantly worse scores on all knowledge measures than non-users. Lastly, the HHP group revealed an improvement in psychological well-being compared to the AM group.

Keywords

Art messaging; nurse led intervention; Hepatitis A, B, C Virus; HIV/AIDS transmission

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Introduction

The transition from adolescence to adulthood is a challenging time for many homeless young adults because they face stressors which include lack of financial, psychological, social support, and vulnerability due to violence and crime (Moore, 2005). Homeless youth also experience health risks such as exposure to the elements, inadequate nutrition, lack of access to medical care, sex work, and mistrust of medical providers (Kelly & Caputo, 2007). Substance use, unprotected sexual behaviors and emotional imbalance are more prevalent among this cohort when compared to their peers who live with a parent (Moore, 2005).

It is estimated that nationwide, between 75% to 95% of homeless youth have reported use of marijuana or other drugs (Halcon & Lifson, 2004). The association between substance use and risk for HIV is of concern as adolescents' knowledge about HIV infection may be insufficient. As knowledge about HIV transmission generally precedes the perception of vulnerability to HIV infection (Brooks, Lee, Stover, & Barkley, 2009), knowing about the possibility of contracting HIV has repeatedly been shown to be insufficient as a sole motivator for behavior change (Weinhardt, Carey, Johnson, & Bickham, 1999).

Homeless youth are 10 to 12 times more likely to be exposed to hepatitis B virus (HBV) and hepatitis C virus (HCV) when compared to age-matched community-dwelling counterparts (Feldmann & Middleman, 2003; Noell et al., 2001), placing them at risk for chronic liver disease (Mao et al., 2010). Prevalence of HBV and HCV in homeless youth has been reported to be as high as 9.2% and 12.6% for HBV and HCV, respectively (Noell et al., 2001). Predictors of HBV and HCV include lifetime crack cocaine use, injection drug use, prostitution, and unprotected sex (Feldmann & Middleman, 2003).

While Marshall, (2008) contends that high level of knowledge of HIV is a prerequisite to informed decision-making, it is clear that other factors also need to be considered if behavior is to be positively impacted, particularly as homeless young people are also at high risk for depression, conduct disorder, and psychosis (Kidd, 2006; Akins, 1988; Nyamathi et al., 2005) Frequently untreated, these mental health problems can have a devastating effect, including suicide (Roy et al., 2004). With rates of clinical depression ranging from 12% to 84% (Rohde, Noell, Ochs, & Seeley, 2001; Van Leeuwen et al., 2004), these youth often suffer from family disorganization, ineffective parenting, and maltreatment (Paradise & Cauce, 2003; Tyler, 2006).

Art Intervention May Be an Effective Approach in Dealing with Homeless Youth's Health

Since 1940, art therapy has been used to improve the mental and physical health of homeless youth by virtue of its creative approaches of exploring emotions, thoughts and ideas (Connor & Donohue, 2010; Sweeney, 2009); in particular, it has a positive effects on mood, self-esteem and physical activity (Delgado, 2000). Art therapy has also been shown to be an effective means to help young people deal with challenges such as poverty, substance abuse and discrimination (Fliegel, 2005), and a way to effectively communicate with their peers (Boreli, Bersani, & Reboucas, 2002). Since art is an engaging way to pique the interest of young adults, we were interested in assessing the impact of art sessions not only in terms of reducing symptoms of depression and anxiety, but as well increasing knowledge when information was indirectly integrated.

Nurse-Led Hepatitis Health Promotion has Shown Success in Improving Health in Vulnerable Populations

Our research group has successfully implemented nurse-led interventions to increase hepatitis vaccination and reduce HIV risk in homeless and substance-using populations (Nyamathi et al., 2009; Nyamathi, Sinha, Greengold, Cohen, & Marfisee, 2010). Nurse-

delivered programs have also been successfully implemented with runaway girls to decrease distress and risk behaviors (Saewyc & Edinburgh, 2010). Using group format, nurse-led HHP discussed the cognitive elements of HCV as an infection, how it is transmitted, and misperceptions and skepticism which have been found to be of interest among youth (Rew, Chambers, & Kulkarni, 2002). As both nurse-led and art programs have impacted mental health, we investigated the effect of the nurse-led HHP and art intervention on both HIV and hepatitis knowledge and mental health among homeless youth.

Methods

This pilot study was conducted among a convenience sample of 156 young, homeless drug users who frequented a homeless youth drop-in agency to assess the impact of a two-group intervention in improving HIV and hepatitis knowledge and mental health. The two programs consisted of a Nurse-led HIV/AIDS and Hepatitis Health Promotion (HHP) program and an Art Messaging (AM) Program, which incorporated a nurse-run health promotion session. Data were collected from February 2009 to January 2011. Six-month follow-up questionnaires were completed by 100 participants (65% of the sample); typical in studies following challenging risk populations (Milburn, Liang, Lee, & Rotheram-Borus, 2009; Milburn et al., 2007; Pollio, Thompson, & North, 2000). Loss-to-follow-up were equal in each group and were more likely to be among African Americans or Hispanics, among those who had no intimate partners ($p < .05$), and those who were cocaine users at baseline (58% vs. 28% for non-cocaine users). No differences were found with respect to age, education, use of other substances, baseline knowledge or mental health.

Nurse-Led HIV/AIDS and Hepatitis Health Promotion (HHP) Program

A total of three to four 45-minute group sessions were led by a research nurse over a six month period and covered the following content: a) hepatitis A, B and C virus infections, basics of HIV prevention and transmission; b) HAV/HBV vaccination; c) training in behavioral, self-management, and communications skills; d) overcoming barriers to completion of the HAV/HBV vaccination series and implementing behavior change; and e) development of relationships, activities and social networks conducive to achieving and maintaining reductions in drug and alcohol use. Many (75%) of the HHP participants completed 3–4 sessions. Strategies for enhancing compliance with visits to other health care providers were also included.

Art Messaging (AM) Program

The AM program was delivered by two California Institute of the Arts (Cal Arts) faculty over 3–4 sessions, depending upon completion of the project. The majority of participants (80%) completed the 3–4 sessions; each session being two hours in length. The Art faculty met with a group of 4–6 youth and explored their thoughts and feelings about life, use of drugs and alcohol, and life goals using poetry, video, art work and photos. More specifically, the youth as a group decided the theme they wanted to focus on (i.e., dangers of initiating drug use, challenges living on the streets) for the 3–4 week sessions and utilized an assorted array of artistic modalities to present them. Most popular was videotaping each other on the beach on how they spent their day, using art, drawing and poetry to portray how they felt in the present, or a portrayal of their mood. They also enjoyed explaining what their artistic form meant to them in the safety of the group. Imbedded in the sessions was a one-hour session which informed the youth about the basic facts concerning HIV/AIDS, hepatitis, and the HAV/HBV vaccine.

Procedure

Following human subjects approval, utilizing a community-based participatory approach, a Community Advisory Board composed of homeless youth, Cal Arts faculty, agency staff, study investigators, and trained research staff, conducted focus groups to design program announcement flyers and finalize the AM intervention. Youth who frequented the participating site were informed of the study by an approved postcard-sized flyer with an artistic designed invitation. The research staff also conducted brief presentations at the site to discuss the study with the youth and assist them in understanding the informed consent. Interested youth were then provided informed consent, and administered a brief eligibility screener that inquired about demographic characteristics, Texas Christian University (TCU) Drug Screener information (Simpson & Chatham, 1995), homeless status, and eligibility for the hepatitis B vaccine. Youth who met the following eligibility criteria: a) being homeless; b) aged 15–25; and c) using any type of drug within the last six months; then signed a second informed consent to enroll in the study and were administered a baseline questionnaire. All participants were paid $10 for completion of the screener and baseline questionnaire and randomized by a computer generated sequence into one of the two groups.

Measures

Socio-demographic variables collected at baseline included age, ethnicity, gender, education, intimate partnership, sexual partner history, homeless history and foster care history.

Dangerous sexual encounters were assessed by an item asking about trading sex for money.

Drug and alcohol use was measured by the TCU Drug History Form (Simpson & Chatham, 1995). This questionnaire records the lifetime and current (within the last six months) use of 16 drugs used orally and by injection and has been tested with drug-using homeless young adults (Nyamathi, Hudson, et al., 2010).

Coping with recent stressful events adapted by Murphy, Rotheram-Borus, & Marelich, (2003) for young adults, consists of 37 items rated on a five-point Likert scale. Seven subscale scores are calculated: self destructive escape, passive problem solving, positive action, spiritual hope, depression/ withdrawal, social support and nondisclosure/problem avoidance. Reliability coefficients ranged from .65 to .87 for young adults. For this study, an 18-item instrument was constructed from the original 37 items to reduce response burden; at least one item for each of the subscales was retained. Responses ranged from 1 “never” to 5”always”.

Outcome

Depressive Symptoms were measured with the 20-item CES-D Depression Scale (CES-D) (Radloff, 1977). The CES-D is a weighted sum score of number of depressive symptoms. Responses vary from 0 “none of the time” to 3 “most of the time.” For the general population, a score of 16 or higher suggests a need for psychiatric evaluation (Radloff, 1977); among young adults, a score of 12 for males and 22 for females may suggest a similar need (Garrison, Addy, Jackson, McKeown, & Waller, 1991). Scores measure depressive symptomatology on a continuum from 0 to 60. In this study, reliability for the CES-D was .91.

Psychological Emotional Well-Being was measured by the 5-item Mental Health Index (MHI-5) (Stewart, Hays, & Ware, 1988). Reliability for the psychological well-being scale in this sample was .83. Item scores were summed and linearly transformed to a 0 to 100

range, with higher values indicating better psychological well-being. A score of 66 is the cut-off for poor emotional well-being (Rubenstein et al., 1989).

HIV/AIDS Knowledge was measured by a modified 21-item CDC knowledge and attitudes questionnaire for HIV/AIDS (NCHS, 1989). Content covered a range of topics including knowledge about AIDS and its transmission; both of which formed the two major cognitive and transmission subscales. Modifications to the CDC instrument have been detailed elsewhere (Leake, Nyamathi, & Gelberg, 1997). Cronbach's alpha for the overall HIV/AIDS knowledge and attitude scale was .88 for this study. Reliabilities for the cognitive and transmission subscales were .72 and .86, respectively. Correct responses to the items were summed yielding a total knowledge scale with a range of 0–21 and two subscales with a range of 0–9.

Knowledge about Hepatitis B and C was measured by 6- and 12-item subsets of scales designed for our adult hepatitis study (Nyamathi, Tyler, et al., 2010). The HBV/HCV questionnaire was evaluated by an expert panel and demonstrated face and content validity. Reliabilities for the reduced sets of HBV and HCV items were low (.61 for HBV and .60 for HCV) so we formed indices of knowledge by summing the numbers of correct responses to the HBV (range 0–2) and HCV (range 0–6) knowledge items.

Data Analysis

Continuous variables were assessed for normality. Change in the knowledge and mental health measures over time was examined with paired t and Wilcoxon signed rank tests on differences between six-month and baseline values; the two programs were then contrasted using repeated-measures analysis of variance. Although no interactions between program and time were found, we repeated the change analyses within each program since power to detect interactions at the conventional level of .05 was poor in this pilot study. The resulting profiles of change for each program were then contrasted descriptively. As improving knowledge of HIV and hepatitis was a primary aim of the intervention and no program differences in knowledge were found at baseline, linear regression modeling was used to quantitatively compare the two programs on the knowledge measures at six months. Initially, unadjusted associations of the six-month knowledge scores with sociodemographic, health and stress coping measures at baseline were examined with the two-sample t tests, analysis of variance and correlations. Variables that were associated with these outcomes at the .15 level were then used as predictors in multiple linear regression analyses. An indicator for program and the baseline value of the outcome were included in each regression model; with the exception of these two variables, predictors were sequentially eliminated from the models if they were not significant at the .10 level. Final models were assessed for multicollinearity and r squares were examined.

Results

Sociodemographic and Background Characteristics

Most participants were male (70%) and the mean age was 21.2 years (SD: 2.4). The majority (78%) was less than 24 years of age and their median length of homelessness was 2 years. Whites made up 58% of the sample, followed by African-Americans (22%), persons of other ethnicities (11%, respectively) and Hispanics (9%). Almost half (48%) reported having an intimate partner. Nearly one-fifth considered themselves to be in fair or poor health; the majority smoked (82%) and virtually all used alcohol (87%) and marijuana (93%). Nearly half the sample reported 10 or more sex partners in their lifetime. No program differences were found for gender, age, education, ethnicity, homelessness, mental health and knowledge.

Impact of the Programs on HIV and Hepatitis Knowledge

In the total sample, HIV/AIDS total knowledge scores increased from baseline to six-month follow-up. Total knowledge mean increased from 16.56 (SD 4.3) to 18.94 (SD 3.6). The cognitive and transmission knowledge subscale scores also improved significantly ($p < .001$). Similar improvements in HBV and HCV knowledge were found ($p < .001$). Within each group, knowledge generally increased. Knowledge about HIV/AIDS Transmission increased in both groups, however it was more pronounced in the HHP group. In terms of HIV/AIDS cognitive knowledge, only the HHP group improved ($p < .001$). Knowledge gains were significant in both groups for HBV and HCV knowledge ($p < .001$); yet, they were more pronounced in the HHP group for all measures.

Impact of the Programs on Mental Health

Psychological well-being scores in the total sample rose significantly from 62.10 (SD 22.6) at baseline to 66.75 (SD 22.1) at follow-up. Well-being scores also rose significantly in the HHP group, from 63.04 (SD 24.1) at baseline to 71.65 (SD 20.2) at follow-up, but not in the AM group. No significant changes in depressive symptoms were noted.

Associations with HIV and Hepatitis Knowledge Measures

Associations of categorical variables with total HIV/AIDS knowledge, HIV/AIDS cognitive and transmission knowledge and HBV and HCV Knowledge indicated that Whites had lower scores compared to non-Whites on HIV/AIDS transmission knowledge, while participants who were partnered scored better on total HIV/AIDS knowledge and AIDS cognitive knowledge than their counterparts who were not partnered (all $p < .05$). Youth reporting to be Men who have Sex with Men (MSM) scored better on total HIV/AIDS knowledge and the HIV/AIDS cognitive and transmission knowledge subscales (all $p < .01$), while recent binge drinkers scored lower than non-binge drinkers on total HIV/AIDS knowledge ($p < .05$). Recent hallucinogen users at baseline scored lower than non-users of hallucinogens on all of the knowledge measures (all $p < .05$). Additional variables for which no significant knowledge differences were found included: chronic homelessness, foster care history, current smoking, Injection Drug User (IDU) history, health status, history of unprotected sex, and number of sexual partners.

In correlation analyses of continuous variables with the same knowledge measures, age and education were not significantly related to any of the six-month knowledge measures. Frequency of “coping with problems by trying to get life together” was associated with all of the six-month knowledge measures; correlations ranged from .25 for HBV knowledge to .32 for total HIV/AIDS knowledge. Frequency of formulating action plans was only associated with six-month HBV knowledge; and “reminding oneself that there are more important things in life” was not associated with any of the six-month knowledge measures.

Multivariate Findings

Multiple linear regression analysis revealed that participants in the HHP program had higher scores at six-month follow-up than those in the AM program for all knowledge measures: total HIV/AIDS knowledge, HIV/AIDS cognitive knowledge, HIV/AIDS transmission knowledge and HBV and HCV Knowledge (all $p < .05$). Youth who said more often that they were attempting to “Get Their Life More Together” had higher scores for all types of knowledge except HBV knowledge (all $p < .05$). Youth who reported hallucinogen use at baseline consistently performed worse on the six-month knowledge measures (all $p < .05$). Those who had significant others had better scores on the total AIDS knowledge scale and its subscales ($p < .05$), and those who were in excellent or very good health did better on HIV/AIDS total knowledge and cognitive knowledge than their less healthy peers ($p < .05$).

Younger participants had higher scores on six-month HBV knowledge ($p < .05$), but age was not related to other knowledge measures. R-squares for the models ranged from .28 for HBV and HCV knowledge and HIV/AIDS transmission to .37 for total HIV/ AIDS knowledge.

Discussion

This pilot randomized trial evaluated the efficacy of two culturally-sensitive intervention programs targeting homeless youth in improving knowledge of HIV/AIDS, and HBV and HCV infections. We also sought to evaluate the use of these two interventions on psychological well-being and depressed mood. Our findings revealed a significant increase in total HIV/AIDS knowledge and HBV/HBC knowledge over time from baseline to six month follow-up; the HHP participants had stronger and more consistent improvement and higher six-month scores than the AM intervention participants. Our findings for the HHP group are consistent with other studies showing the efficacy of nurse-led interventions among homeless youth (Moody, Childs, & Sepples, 2003; Nyamathi, Branson, Kennedy, Salem, Khalilifard, Marfisee, Getzoff, & Leake, under review).

We are encouraged by the fact that the data has demonstrated that using an HHP intervention approach has indicated a significant impact of a brief nurse-led intervention in reducing drug use at six months as well (Nyamathi, Hudson, et al., 2010). However, we were anticipating that homeless youth might be more attuned to learning about HIV/AIDS if the material was interwoven in an art format, in part because of the previous studies which have demonstrated the capacity of art to be an effective means of health education. Moreover, our previous study revealed that homeless youth believed a healthcare intervention delivered through a creative art messaging approach would appeal to their peers and possibly increase their participation (Nyamathi et al., 2007).

Findings of our study show that when a nurse-led education program is delivered in a group format that is free-flowing, engaging and interactive, substantive knowledge will be gained. We also believe that engaging a nurse with years of experience working with homeless youth, who can relate to them as peers rather than as subordinates may have led to the superior findings of the HHP program as compared with the trendier AM program. Thus, the greater success of our HHP intervention may be due in part to the fact that the nurse-provider becomes part of the youth's new community of 'trusted individuals. Being a calm, empathetic and objective health care professional has resulted in positive outcomes in other stigmatizing situations as well; most notably, with suicidal or self-harming behaviors (Pompili, Girardi, Ruberto, Kotzalidis, & Tatarelli, 2005). In regression analyses, participants who were working on getting their life together had higher scores on all HIV/ AIDS and HCV knowledge measures at six months compared to their counterparts not coping in this manner. Moreover, those who revealed having a partner also reported greater HIV/AIDS knowledge at six months than those who were non-partnered. Studies have also shown that having a strong support network or 'connectedness" was predictive of significant risk reductions for both HIV and substance abuse (Bantchevska, Bartle-Haring, Dashora, Glebova, & Slesnick, 2008).

Clearly, drug use was pervasive in this young sample, with more than one-quarter reporting IDU and over 90% reporting marijuana use. Hallucinogen users had significantly worse scores on all knowledge measures than non-hallucinogen users. Our sample also reported a high level of sexual activity as nearly half reported 10 or more lifetime partners. Clearly, the relationship of substance use leading to increased sexual risk-taking is well established (Kennedy & Roberts, 2009; Roberts & Kennedy, 2006). In our study, hallucinogen users were also the group with the least knowledge improvement. These unique findings may

imply that hallucinogen users are at greater risk than others in similar situations, as this class of drugs is more likely than others to impair cognitive processing.

At six months, those who reported excellent or very good physical health also had higher HIV/AIDS total and cognitive knowledge when compared to those in good health. Our previous work also revealed that the youth's perception of 'poor health' was correlated with maladaptive coping skills and high substance use (Nyamathi, Hudson, et al., 2010). While neither IDU nor sexual activity was related to six-month knowledge scores, future work may be needed to further evaluate this relationship. Those who reported great physical health also had higher HIV/AIDS total and cognitive knowledge at six months compared to those in good health. Associations found with six-month knowledge revealed that MSMs scored higher on all HIV/AIDS knowledge scales at that point as compared to non MSMs. It is possible that the MSM subgroup may have received previous exposure to AIDS education from other community or AIDS-related services.

In terms of mental health, our study showed depressive symptoms were prevalent among our participants. In fact, the mean of depressive symptoms in this sample was above the cut-point of 16 (Radloff, 1977; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977), often cited in connection with adult populations. Further, the mean psychological well-being score was below the warning level of 66 proposed by Rubenstein et al. (1989). Six-month follow-up scores revealed a significant improvement in psychological well-being within the HHP group compared to no change in the AM group. While art therapy has been shown to decrease depressive symptoms in other similarly challenged populations (Gussak, 2007), this intervention may need a period of time greater than six months to show stronger results. For example, Hamre et al. (2006) showed continued and progressive improvements in CES-D scores over a four-year period. In the study by Persons (2009), subjects involved in a program for longer than six months experienced decreased depression and other stressors for 2–10 hours per week. For homeless youth who have distanced themselves from their emotional pain, both programs may need more time to uncover and effectively address underlying issues.

Limitations

We acknowledge that the follow-up rate was fairly low despite being the norm for similar populations (Milburn et al., 2009; Milburn et al., 2007; Pollio et al., 2000). Moreover, the youth were a convenience sample from one drop-in site and data were based on participants' self-report. Thus, generalizations to other homeless youth cannot be made. Nevertheless, the authors have extensive experience working with homeless youth and future studies will include a larger, random sample and incorporate additional strategies to increase the completion rate.

Conclusion

The results of this study confirm that homeless youth, particularly those that participated in the HHP program significantly increased their knowledge of HIV/AIDS, HBV, and HCV and additionally improved their psychological well-being when the information is presented through culturally-sensitive programs. While the provision of direct knowledge was powerful, the study confirmed homeless youth respond positively and continue to return to an intervention when it is provided in an interactive, flexible, and multi-service environment, and when the staff makes them feel welcome. The findings of our study have uncovered new areas for investigation; most notably the relationship between improved learning and having a partner and the significant deficits in learning among youth who report hallucinogen use. These are important and unexplored areas in need of further study.

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