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Assessment of Mobile Device and SMS Use for Diet and Exercise Information Among Rural Mexican-American Adolescents^{1,2}



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This is a pilot study regarding the use of mobile technology and short message service (SMS) for diet and exercise among rural Mexican American adolescents (RMAA). Authors used convenience sampling to recruit RMAA seeking care at a rural healthcare clinic and conducted three focus groups ($n = 12$). Content analysis was used to identify categories and subcategories. Participants applied diet and exercise information in their lives based on an interaction with community and through the use of use mobile devices. Culturally sensitive use of mobile devices and SMS may be a tool to provide rural adolescent populations with resources.

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RURAL YOUTH HAVE significantly higher prevalence of overweight and obesity than urban youth (Joens-Matre et al., 2008; Liu, Bennett, Harun, & Probst, 2008; Lutfiyya, Lipsky, Wisdom-Behounek, & Inpanbutr-Martinkus, 2007; Nelson, Gordon-Larsen, Song, & Popkin, 2006). Ethnic minority adolescents are particularly at risk as the prevalence of overweight and obesity among ethnic minority adolescents is increasing. The prevalence of obesity in Mexican American adolescent males has almost doubled in the last 20 years, from 14.1% in the period between 1988 and 1994 to 26.8% between 2007 and 2008 (Ogden & Carroll, 2010). Obesity prevalence in Mexican American adolescent females increased as well from 13.4% between 1988 and 1994 to

17.4% between 2007 and 2008 (Ogden & Carroll, 2010). Evidence from a retrospective analysis of data from a rural health clinic with a largely Mexican American population identified almost half ($n = 105$, 49.5%) of rural Mexican American adolescents (RMAA) seeking care at the clinic as overweight, obese or severely obese (Champion & Collins, 2012). Attention is needed for RMAA and their communities to address these rising rates in weight.

The use of mobile devices for Internet access and short messaging service (SMS) or texting, to communicate with adolescents in regard to diet and exercise practices may help address the issue of overweight and obesity in ethnic minority rural adolescent populations. Increased accessibility and use of mobile devices among adolescents and improved health outcomes with its use in behavior modification interventions suggest a potential for its use with ethnic minority rural adolescents. Seventy five percent of 12 to 17 year old adolescents currently own cell phones, and adolescents from ethnic minority populations tend to use cell phones to access the Internet more than non-Hispanic White adolescent populations (Lenhart, Ling, Campbell, & Purcell, 2010). Researchers who conducted two systematic reviews

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reported significant changes in behavior outcomes in disease management and disease prevention intervention studies that used mobile devices as one component of intervention delivery (Cole-Lewis & Kershaw, 2010; Krishna, Boren, & Balas, 2009). However, empirical studies of mobile health interventions lack ethnically diverse sample populations (LaPlante & Peng, 2011), and theoretically-based and empirically tested obesity prevention interventions for ethnic minority adolescent populations are generally lacking (Branscum & Sharma, 2010; National Heart Lung and Blood Institute, 2008). Healthcare providers in rural areas may be able to use adolescents' frequent use of mobile devices as a means of communicating diet and exercise guidance to rural adolescent populations, and further study is needed to explore this potential.

A retrospective analysis of data that was collected routinely in delivery of clinical services at a rural health clinic in a medically underserved area in Southwest Texas serving rural Mexican American adolescents (RMAA) was conducted (Champion & Collins, 2012). The county in which the clinic is located has a population of approximately 26,000 people (USDHHS, 2009) and is considered a micropolitan statistical area (Texas Department of State Health Services, 2012). Seventy percent of residents in this area are of Hispanic background (Texas Department of State Health Services, 2012). The rural clinic serves a five county area on the Texas–Mexico border. First documentation of overweight/obese status occurred most frequently (76.3%) when youth were between 11 and 16 years of age. Documentation of intervention for overweight and obese adolescents by healthcare providers at the clinic was low. The majority of cases (51.4% to 75.6%) did not include documentation of intervention, and of those with documentation, diet and exercise interventions were documented most frequently (57.1%).

The aim of this pilot study was to describe how rural Mexican American adolescents use the Internet or short message service (SMS) via mobile devices to gain knowledge about diet and exercise. Evaluating the use of mobile devices for diet and exercise knowledge will provide evidence for its potential use in a comprehensive, multi-factorial, multi-component intervention to address overweight and obesity in this community of rural Mexican American adolescents.

Background

The Weight of RMAA is a Priority Health Concern

The prevalence of overweight and obesity in ethnic minority adolescents is rising. Mexican American adolescent males had the highest prevalence of obesity among all male adolescents whereas Mexican American adolescent females had the second highest prevalence of obesity among all

adolescent females in the United States (Ogden & Carroll, 2010). Obesity in childhood puts youth at risk for cardiovascular, renal, hepatic, pulmonary, psychological, neurological, orthopedic, and metabolic illness that may continue into adulthood (Kumanyika et al., 2008).

Health Disparities in the Region

The social demographics for the city in which members of the target population live are critical indicators of health disparity. Approximately 28% of individuals in this region are living below poverty level as compared to 17% in the US (Texas Department of State Health Services, 2012). The median income per household income for this area (\$34,456) is lower than that for Texas (\$50,920) and the US (\$52,762) (U.S. Department of Health and Human Services (USDHHS), 2009).

Approximately 23% of the population is uninsured, 32% of the population receives Medicaid, and 24% of adults 25 years of age and older do not have a high school diploma in the city in which members of the target population live (USDHHS, 2009). Slightly more than a third (31.1%) of individuals 19 years of age and younger living in the city of the target population live below poverty as compared to 22.8–31.4% of individuals 0 to 19 years of age living in peer counties throughout the United States (USDHHS, 2009). The pregnancy rate for 13 to 17 year olds in this county is 27.7 per 1000 women, and is higher than the state of Texas average which is 21.4 per 1000 women (Texas Department of State Health Services, 2012). Disproportionately high rates of poverty, lower educational preparation, and teen pregnancy intensify this community's vulnerability.

Use of Mobile Technology With Adolescent Populations to Address Health Issues

Health behavior intervention content has been delivered using mobile technology to address health risk behaviors in adult and adolescent populations. Strengths of mobile health intervention studies include frequency of reminders and tailored messaging, low cost of intervention and randomization (Militello, Kelly, & Melnyk, 2012). Limitations of empirical studies of mobile health interventions included small sample sizes (Krishna et al., 2009; LaPlante & Peng, 2011; Militello et al., 2012), lack of ethnic diversity (i.e. mostly non-Hispanic White samples) in sample populations (LaPlante & Peng, 2011), self report bias, and lack of long term follow-up (Militello et al., 2012).

A review of health promotion interventions showed significant changes in exercise in more than half of mobile health studies reviewed (LaPlante & Peng, 2011) and was the only outcome where significant differences were found (Militello et al., 2012). Significant changes were found in behavior outcomes in a majority of studies in disease management and disease prevention (Cole-Lewis &

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