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The relationship between type of telephone service and smoking cessation among rural smokers enrolled in quitline tobacco dependence treatment

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ABSTRACT

Quitlines are successful tools for smoking cessation, but no known study has examined whether type of phone service (cell phone only (CPO) vs. landline (LL)) impacts quitline utilization, quit attempts, and sustained cessation. This report details an observational study examining the association between phone service and quitline utilization and cessation among Ohio Appalachian adults willing to quit smoking and enrolled in a cessation trial from 2010 to 2014. A secondary analysis was conducted with data obtained from smokers enrolled in the Ohio Tobacco Quitline arm of a group randomized trial (n = 345). The intermediate outcome variables included number of calls, cumulative total call length, average call length, verified shipments of NRT, and 24-hour quit attempt. The primary outcome measure was biologically confirmed 7-day point prevalence abstinence from tobacco at 3, 6, and 12 months post treatment. Participants with LL service, on average, made almost one more call to the quitline and spoke 17.2 min longer over the course of treatment than those with CPO service. Those with LL service were more likely to receive a second 4-week supply of NRT. Phone service status was not associated with average quitline call length, receiving at least one NRT shipment, having made one quit attempt at the end of treatment, or biochemically confirmed abstinence at 3, 6, or 12-month follow-up. Participants with LL services completed more counseling calls, accrued a longer cumulative length, and received more NRT when compared with CPO service participants. However, type of phone service did not deter abstinence outcomes.

1. Introduction

Tobacco use remains the leading cause of preventable disease and death in the United States (US Department of Health and Human Services, 2014). Though smoking prevalence has declined over the last fifty years, 16.8% of US adults continue to smoke cigarettes (Jamal et al., 2015). Cigarette smoking increases the risk of heart disease, respiratory disease, and cancer (US Department of Health and Human Services, 2014). Quitting smoking lowers these risks, and those who quit by the age of 35 years have similar long-term risks as never smokers (Doll et al., 2004). The majority of U.S. adult smokers want to quit, and in 2013, approximately two thirds of smokers had made a serious quit attempt in the past year (Lavinghouze et al., 2015).

Despite decreased use in the overall population, smoking prevalence disparity has increased between socially advantaged and disadvantaged populations (Jamal et al., 2015). Today, tobacco use is concentrated among historically marginalized populations within the United States (Jamal et al., 2015). The burden of tobacco related health disparity is felt more intensely among the most vulnerable, including lower socioeconomic status populations, along with racial and ethnic minorities (US Department of Health and Human Services, 2014; Jamal et al., 2015; Jarvis and Wardle, 2011). This increase in tobacco attributable health disparity is fueled by the differential rate at which vulnerable sub-populations are able to access cessation intervention and successfully achieve tobacco abstinence (Jarvis and Wardle, 2011).

Tobacco telephone quitlines are successful tools for smoking cessation, especially in reaching broad populations of users (Lien et al., 2016; Giskes et al., 2007; Stead et al., 2013). Since the turn of the century, telephone quitlines have been advocated for widespread use due to the availability of telephones even among populations living in isolated areas where medical services, including access to trained cessation specialists, are limited and among those with low socioeconomic status (Fiore et al., 2004; Fiore et al., 2008). Quitlines that offer multiple proactive calls and nicotine replacement therapy (NRT) are the most effective (Stead et al., 2013). Increased number of calls and intensity of use relate to higher quit success; however, most individuals do not utilize the quitline to the full extent (Lien et al., 2016; Stead et al., 2013). As quitlines are positioned to deliver effective cessation

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treatment to marginalized populations, with potential to help curb further growth of tobacco attributable health disparities in these communities, it is important to understand barriers for utilizing quitline services in populations where access to other cessation services are limited.

The Centers for Disease Control and Prevention has highlighted the need to ensure free telephone quitline accessibility to vulnerable populations with higher concentrations of tobacco use (Centers for Disease Control and Prevention, 2004). One model, endorsed recently by the tobacco control community (Tobacco Control Research Priorities Working Group of the NCI Board of Scientific Advisors, 2016) for use to identify novel behavioral components to enhance smoking treatment engagement and effectiveness with vulnerable populations, is the Capability-Opportunity-Motivation Behavioral (COM-B) System (Michie et al., 2014; Michie et al., 2011). The COM-B System, as it would apply to tobacco cessation with vulnerable populations, posits that *capability* (psychological and physical capacity to engage in cessation) and *opportunity* (physical and social factors that make cessation possible or prompt it) impact 1) *behavior change*, *directly*, and 2) *behavior change through motivation* (both reflective and automatic processes) to maintain effective engagement with cessation treatment necessary to achieve and maintain cessation (Michie et al., 2014; Michie et al., 2011). Use of the COM-B System framework offers a unique opportunity to uncover the physical and social context of engagement in smoking cessation for members of populations where smoking prevalence remains high despite smokers' willingness and desire to stop smoking and engage effective treatment (Sorensen et al., 2004; Sorensen et al., 2003). This type of investigation allows us to uncover why, despite offering effective and free telephone-based cessation services, individuals from vulnerable populations motivated to quit, in particular, are still under-utilizing quitlines.

Limited research is available that explores the capability and opportunity for accessing quitline cessation services in low-income and rural communities. One exception is the work of Sheffer and colleagues who identified that access to a phone for quitline services impacted > 1/3 of their study participants in a community-based participatory project in the Arkansas' Mississippi Delta, a region with a high concentration of rural, poor, African-American residents (Sheffer et al., 2016; Sheffer et al., 2011).

Since telephones are the means by which quitline services are utilized, it is important to question if individuals from high tobacco prevalence populations have access to phone service which will allow them to fully utilize the effective treatment offered by quitlines. One issue that could impact quitline utilization is phone service access type. In 2009, 22.9% of US households had cell phone only service (Blumberg and Luke, 2012), while in 2015, it more than doubled to 48.3% (Blumberg and Luke, 2016). With this shift to cell phone only use, especially among low-income individuals (Blumberg and Luke, 2016), access to effective treatment offered by quitlines should be further examined. A recent study reported that among individuals with restricted calling plans (e.g. Medicaid-issued phones), a robust use of the quitline could consume 22%–34% of the 250 monthly minutes available (Bernstein et al., 2016).

No known study has examined whether type of phone service impacts quitline utilization, quit attempts, and sustained cessation. The aim of this study was to examine the association between phone services (cell phone only (CPO) vs. land line (LL)) and cessation outcomes among Ohio Appalachian adults willing to quit smoking and enrolled in a trial utilizing the Ohio Tobacco Quitline to deliver cessation treatment. Given that the Ohio Appalachian region is home to more Medicaid recipients than the rest of the state, and that poverty also impacts a higher concentration of residents in this region (Ohio Medicaid Assessment Survey, 2015), we believed that phone access could impact quitline utilization and, therefore, cessation outcomes, even among residents of the region interested in quitting smoking. It was hypothesized that participants with CPO service would have fewer calls, lower cumulative total call length, and lower average call length with quitline cessation counselors and would receive fewer shipments of NRT. It was also hypothesized that participants with CPO service would be less likely to make a quit attempt by the end of cessation intervention, and would be less likely to be abstinent 3, 6, and 12 months post cessation intervention enrollment.

2. Methods

2.1. Study overview

To examine the association of CPO versus LL phone service and phone-based cessation treatment and outcomes, an observational study using secondary analysis was conducted with data obtained from participants enrolled in the Ohio Tobacco Quitline arm (called here forth the Quitline cohort) of a recently published group randomized cessation trial (Wewers et al., 2016). The study was approved by the Ohio State University Institutional Review Board.

2.2. Procedure

To establish the Quitline cohort, community health workers, hired and trained by research staff, recruited smokers at geographically and socioeconomically diverse sites in six Ohio Appalachian counties. Eligible participants: 1) were age 18 or older; 2) self-reported combustible tobacco daily use; 3) resided in a participating county; 4) had no NRT contraindication; 5) were non-pregnant, if female; 6) agreed to participate in study protocol; 7) wanted to quit smoking in the next 30 days and 8) provided written informed consent. Enrolled participants completed a baseline in-person interview with a county-specific interviewer, hired and trained by research staff. Next, and unique to the Quitline cohort, participants met with the community health worker who explained the study protocol, including how to access the Ohio Tobacco Quitline for cessation assistance. Quitline services were administered by National Jewish Health® through a contract with the Ohio Tobacco QuitLine. Treatment, based on evidence-based best practice guidelines for telephone cessation intervention, included up to five proactive cognitive-behavioral telephone counseling calls and unlimited reactive calls from a trained Quitline counselor and free NRT (Fiore et al., 2008). Twenty-one milligram patches for daily use were distributed by the Quitline in two 4-week shipments following study protocol—the first shipment was disbursed via surface mail following the first counseling call, and the second shipment 4 weeks later following at least a second counseling call. All NRT shipments were approved by research staff, after verifying continued study enrollment. Follow-up in-person interviews were conducted at 3, 6, and 12 month post baseline by the same county-specific interviewer who conducted the baseline survey. All cessation counseling and NRT was delivered between baseline and the 3-month follow-up interview. Participants received a gift card in the amount of $25 at the completion of both the baseline and the 12 month follow-up interviews, and a $10 gift card at the completion of both the 3 and 6 month follow-up interviews. Additional information about study procedures may be found in the paper detailing the parent group randomized trial findings (Wewers et al., 2016).

2.3. Measures

2.3.1. Sociodemographic and tobacco-related characteristics

Age, gender, race, marital status, poverty level, education, household size, health insurance and employment status were collected at baseline survey. Other measures included depressive symptoms as assessed by the Center for Epidemiologic Studies Depression 10-item Scale (CES-D-10) (Radloff, 1977; Zhang et al., 2012), Heaviness of Smoking Index (Heatherton et al., 1989), Fagerström Test for Nicotine Dependence (FTND) (Heatherton et al., 1991), and past use of NRT.