FEASIBILITY & PERCEPTION OF CELL PHONE BASED, HEALTH RELATED COMMUNICATION WITH TEENS IN AN ECONOMICALLY DEPRESSED AREA.

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**Purpose**: Cell phones are a popular means of communication among teens. Studies suggest health-related benefits from cell-based communication with teens; however, research examining the feasibility & perception of cell phone use as a means of health-related communication with teens is lacking, particularly in lower socioeconomic (SES) populations. This study examined the feasibility & perception of cell-based (texting, voicemail [VM] & e-mail/social media), health-related communication with teens in an economically depressed area.

**Methods**: An anonymous, self-administered survey (35-items) was given to teens at Hurley Medical Center pediatric clinics & private pediatricians’ offices in Genesee County, MI where 1 in 5 reside below the poverty level.

**Results**: Demographics of the 747 respondents were; mean age of 15.2yrs, 56.5%, female, 40% white & 60% non-white. Eighty-six percent of respondents owned a cell phone, 87% had data, 96% texted, 90.5% emailed / used social media, & 68% had VM. More white & older teens (>16yrs) had a cell phone (p<0.05). Regarding cell-based communication with providers, the majority (52%) wanted to text, (37%) VM & (31%) email / social media. Regarding message content & means of delivery, appointment reminders was most desired (99% texting; 94% VM, 95% email/social media), then shot reminders (84.5% texting; 74.5% VM, 81% e-mail/social media), test results (71.5% texting; 75% VM, 65% e-mail/social media), medication reminders (63% texting, 54% VM, 58% e-mail/social media) & general health tips (36% texting; 18.5% VM, 73% e-mail/social media). Overall 70% believed caregivers would support cell-based, communication with their provider. More non-white & older teens (>16yrs) perceived caregivers would also support confidential communication (p<0.01).

**Conclusions**: Findings suggest cell-based communication with teens for health purposes is feasible even in lower SES communities. Majority of the teens expressed interest in communicating with their health provider via cell phone, primarily texting for appointments reminders. They also perceived that cell phone communication would be acceptable by their caregivers. In this age of technology, health providers should consider embracing cell phone as a means of communication with teens.

**Sources of Support**: Grant from Hurley Children’s Pediatric Research and Education fund, Hurley Medical Center, Flint, MI
Purpose: Growing evidence supports social media as a significant influence on attitude, intention, and behavior of its users. Almost one-third of college aged students are on Twitter and 20% use the site daily. Incoming college students may seek out college-themed Twitter pages to gain insights into what to expect from collegiate life. Little is known about the content on pages related to college lifestyle, specifically health-related content. The purpose of this study was to investigate Twitter pages targeting to college students to understand the followers and health related content on these sites.

Methods: The five most popular Twitter pages containing the word “college” in the title were selected for content analysis. We selected two Twitter pages that were “audience generated” meaning content was posted by any Twitter user. Three Twitter pages were “profile owner generated” meaning content was selected and posted by the profile owner only. For each page, 500 of the most recent followers were evaluated for displayed demographic information. We developed a codebook focused on key health-related behaviors and associated outcomes tested through pilot evaluations, it included the following variables: alcohol references (problem drinking references and non-problem drinking references), marijuana, other substances, financial issues, academic concerns, sleep concerns, relationships, and sexual acts/conduct. Each Twitter page was evaluated between January and March 2015 by two coders, interrater agreement was 93%.

Results: Among the five pages reviewed, average age of followers was 19.4 years old. The two “audience generated” pages most commonly included related to sexual acts/conducts (29%), relationships (28%), and alcohol (12%). “Profile owner generated” pages most commonly included tweets related to alcohol (10%), academic concerns (7%), and financial issues (6%), with a majority of tweets not related to any of the variables of interest (70%). Among alcohol references, 60% were related to alcohol intoxication on “audience generated” pages and 29% related to alcohol intoxication on “profile owner generated” pages.

Conclusions: Twitter pages with audience generated content more often displayed tweets related to sexual acts/conduct and relationships, while Twitter pages that restricted posting more often displayed tweets related to alcohol, poor academics, and financial issues. Findings also suggest more than half of all alcohol related tweets referred to alcohol intoxication, a high risk health behavior among college students. This evidence demonstrates the potential influence of followers and viewers on content, specifically the kind of health related content they are choosing to submit and represent college lifestyles. Further studies could evaluate the effect on attitudes of college students that view content over Twitter related to college.

Sources of Support: Seattle Children's Research Institute
"WHY IS THIS PERSON WRITING THIS STUFF ON FACEBOOK?" FEMALE COLLEGE STUDENTS’ PERCEPTIONS OF SEXUAL REFERENCE DISPLAYS ON FACEBOOK

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**Purpose:** Social networking sites (SNS) are increasingly popular among adolescents and young adults as a means of identity exploration, but also as avenues to display risky health behaviors including sexual behavior. Previous studies explored male perceptions of sexual reference displays on SNS, but the views and experiences of women regarding displayed sexual references on social media are unknown. The purpose of this study was to explore female college students’ perception of sexual reference posts on Facebook.

**Methods:** Female students aged 18-24 years were recruited through purposive sampling at two large state universities. Student contacts were identified in campus organizations, informed of the study objectives and tasked with recruiting peers. A trained female facilitator conducted focus groups. Questions were directed to guide the discussion of sexual reference displays on Facebook, prompted by examples from actual public accounts. Groups were recorded and transcribed without identifiers. Two coders initially reviewed each transcript and developed a codebook using an iterative process until reaching consensus. A third investigator reviewed the codebook for clarity. Themes were derived from the most prevalent and salient responses, ensuring agreement among all 3 investigators. Analysis was performed using Dedoose.

**Results:** A total of 23 women with average age 19.8 years participated in 5 focus groups, each lasting 30-60 minutes. Most participants reported having viewed sexual references on SNS. Three major themes emerged regarding posting sexual references: Rationale, Interpretation, and Consequences. (1) Rationale: The most common were attention seeking or advertising: “I don’t think it’s like an increase in sexual behavior, but rather like just the attention. Like sexual attention”. Other suggestions included humor and as a form of communication between two friends as rationales. (2) Interpretation: The importance of context, including identity of poster and relationship to viewer: “I would take it, depending on the person as one of those jokes that I wouldn’t take seriously”. Participants also brought up associations of going out to parties or bars: “Well when I see that, I just envision like this particular group of girls that are good friends on Facebook that are going to go out this weekend, party, get drunk”. (3) Perceived consequences: Sexual expectations from males, real world translation from online life, and changing one’s reputation: “There’s no way she can put that on FACEBOOK and think that guys aren’t gonna think that you’re easy”.

**Conclusions:** Findings suggest that young women perceive that sexual reference displays are shared on Facebook for various reasons. Interpretations varied from the intended significance, such as association with partying, as well as leading to unexpected consequences such as sexual expectations from males. These misperceptions have potential to translate into offline behaviors and health risks including unwanted sexual contact. Future studies should investigate potential interventions to avoid negative
consequences from online miscommunication.

**Sources of Support:** Funding was provided by University of Wisconsin

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**A PILOT TEXT MESSAGING INTERVENTION FOR ADOLESCENTS AND YOUNG ADULTS RECENTLY OFF TREATMENT FOR CANCER**

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**Purpose:** Text messaging (mhealth) is an innovative, low-cost, and scalable mode of intervention to optimize health, especially in adolescents and young adults (AYA). AYA recently off cancer treatment are vulnerable given high risk for relapse, disengagement from follow-up care, and poor adjustment post-treatment. As such, we developed a theoretically informed and semi-tailored texting mhealth intervention to improve knowledge and health promotion after treatment. This pilot randomized controlled trial of THRIVE (Texting Health-related Resources to Inform, motivate, and Engage) tested its feasibility and acceptability and explored its impact on relevant health-related knowledge (e.g., adjustment after cancer, resources, health promotion, late effects) and health behaviors. The development and results of THRIVE will be described.

**Methods:** Methods: AYA (12-25 yo) within 1 year of completing cancer treatment were randomized to the texting intervention (THRIVE) or to receive an AYA survivorship handbook. AYA also choose 1 of 6 goals (e.g., smoking cessation, re-engage in school, physical activity). If randomized to the texting group, they were given an iPhone and received 1-2 texts daily for 16 weeks, including texts specific to the goal they chose. Texting was two-way; many texts prompted AYA to text if they wanted more information or to provide answers to multiple choice questions. AYA completed a battery of measures prior to randomization and post-intervention.

**Results:** Results: 82% of AYA approached enrolled (N = 62; 31 randomized to texting group). 50 AYA (n = 24 intervention) completed the study with evaluable data (Mage=17; 55% female; 31% minority; time since completing tx M= 5.8 months). Goals chosen were 40% increase physical activity, 34% healthy eating, 15% sleep/fatigue, 8% re-engage in school, and 1% each quit smoking and reengage in social life. Feasibility of the texting intervention was good; participants were comfortable with the iPhone, only 1 phone was lost, and no emergency or medical texts were received (per study instructions). 80% compared to 54% of controls read most of the material. Acceptability was high. 100% of intervention group would recommend the program to other cancer survivors compared to 85% of controls. 71% of those in texting group said it had a positive impact on their physical health compared to 54% in the control group. Most (>80%) of the texting group endorsed “somewhat” or “completely” on “easy to use”, “easy to understand”, and “generally useful.” Exploratory analysis on the 20-item knowledge scale showed improvements in both groups (68% of intervention group improved knowledge score after...
intervention versus 58% controls). There was more health promoting behavior change in the intervention group than among controls for physical activity, smoking, sunscreen use, eating whole grains and eating fruits and vegetables, but not sleep.

Conclusions: THRIVE is feasible and acceptable. Exploratory analysis of behavior and knowledge change indicates tailored health communication delivered via texts has the potential for improving in health promoting behaviors and significantly addressing AYA cancer survivorship needs. A larger, more powered, RCT is needed.

Sources of Support: Department of Pediatrics Chair’s Initiative, Children’s Hospital of Philadelphia

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RESPONSIVENESS AND RELIABILITY: UNDERSTANDING TEXT MESSAGING COMMUNICATION IN A PELVIC INFLAMMATORY DISEASE INTERVENTION
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Purpose: Pelvic Inflammatory Disease (PID) is a reproductive health disorder that disproportionately affects low-income, young minority women. The care for PID has shifted to outpatient settings and youth struggle with antibiotic adherence and other self-care behaviors during the 14-day treatment period increasing their risk for adverse sequelae. Youth-focused, disease-specific text-messaging interventions may provide needed adherence support, but limited research has explored communication responsiveness and the reliability of text reported adherence. The purpose of this study is to evaluate patient responsiveness to an automated text messaging system for PID self-management, to examine the reliability of text-reported compared with interview-reported medication adherence, and to examine attenuation over time.

Methods: This study examines data from patients aged 13-25 years with mild-moderate PID enrolled in the Technology Enhanced and Community Health Nursing (TECH-N) study; a randomized controlled trial evaluating the effectiveness of a text messaging and community health nursing intervention for improved self-management and outcomes. All participants received standard of care, antibiotics, and instructions to follow-up after the 14-day treatment period. During the treatment period, the intervention participants also received an automated welcome text message, daily medication reminders, and prompts to report the number of dosages consumed each day via text. This analysis focuses on the text messaging and adherence data from intervention participants. Raw text message correspondence was downloaded from the text messaging system into Excel (Microsoft Office, 2011), organized by patient ID and color-coded based on message type. Basic and user-defined Excel functions were used to count or sum messages by background color or message content and responsiveness to welcome and dosage message types examined. The correlation between text-reported and interview-reported dosage data was established and attenuation over time analyzed using linear regression analysis.

Results: 97 participants were randomized into the intervention group and 94% were eligible for text
message analysis. Most participants were African American (92%) and low income (77%), with a mean age of 18.3 years ± 2.2. 76% patients responded to the welcome message, and the average responsiveness was 53% (SD=34%) for dosage messages. Responsiveness to dosage messages attenuated over time, approximating a 2% decrease per day (β= -0.023, 95% CI -0.03 to -0.015) over the 14-day treatment period. Correlation between text-reported and self-reported medication adherence was positive and moderate (r=0.46, p<0.001). From the two-week follow-up interview data, low text message engagement was not indicative of low self-reported adherence, with patients reporting an average (SD) of 24.2 (5.16) out of 28 pills taken.

**Conclusions:** The TECH-N intervention successfully delivered text support to young women with PID in the outpatient setting. Patients were more than 50% responsive to text messages and text reports of medication adherence were moderately reliable for monitoring medication adherence. Additional research designed to improve responsiveness via text is warranted. Continued use of face-to-face outreach support is critical for adherence research with this vulnerable population of youth.

**Sources of Support:** This research was supported by the National Institute of Nursing Research (1R01NR013507-09 PI: Trent) and the Ferguson Program Fellowship Program in Emerging Infectious Diseases Program (CDC/OMHHE Cooperative Agreement CDC-RFA-MN11-1101, PI: Belcher).

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**SLEEPING WITH ONE’S CELLPHONE: THE RELATIONSHIP BETWEEN CELLPHONE NIGHT PLACEMENT AND SLEEP QUALITY, RELATIONSHIPS, PERCEIVED HEALTH, AND ACADEMIC PERFORMANCE**

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**Purpose:** While technology use is pervasive, its impact is not obvious. An emerging concern is that cellphones may be interfering with young people’s sleep; inadequate sleep is a risk factor for many health outcomes. This pilot research examined the association between cellphone nighttime placement and sleep patterns, relationships, and academic performance.

**Methods:** Through professional and social connections across the United States, this study recruited a convenience sample of 353 17 to 24 year olds to complete an anonymous survey, administered through Survey Monkey™. After completing a consent form, participants responded to questions about demographics, technology use, sleeping patterns, dating relationships and intimate partners, perceived health, and academic performance.

**Results:** Around a fifth (18.5%) of these young people slept with cellphones in their beds or under their pillows. While they slept, another 71.2% kept cellphones on their bedside tables. Around 80% of participants reported that they used their cellphones “all the time” as alarm clocks. Gender, age, self-reported SES, and student status were not significantly associated with sleeping with one’s phone; however, one’s ethnicity ($\chi^2 = 9.1$, p< 0.05), employment status ($\chi^2 = 3.9$, p< 0.05), and residence type ($\chi^2 = 10.9$, p< 0.05) were significantly associated with having a cell phone in one’s bed. Those who slept with their cellphones reported significantly less sleep on weeknights compared to those whose cellphones remained outside of their beds (Student t=2.0, p< 0.05). Reported sleep quality was poorer
for those who slept with their cellphones (Student t=2.7, p< 0.01). Most participants were ambivalent about technology’s impact on their own romantic relationships. Among those who slept with a partner, 22.6% reported that their partner’s cellphone had woken them up during the night. Those who slept with their cellphones perceived their health to be poorer than those who did not sleep with their cellphones (Student t=2.0, p< 0.05). Among students, cellphone nighttime placement was not associated with GPA or satisfaction with academic performance.

**Conclusions:** Practically all young people sleep within arm’s reach of their cellphones. Having a cellphone within one’s bed is related to sleep duration and quality, and this can impact other outcomes. More research, including studies involving experimental designs, needs to be conducted to explore how cellphone nighttime placement influences aspects of a young person’s behaviors, relationships, and health.

**Sources of Support:** Discretionary account of Dr. Borzekowski

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**USE OF TELEHEALTH TO TEACH HEALTHY LIFE SKILLS TO RURAL ADOLESCENT FEMALES**

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**Purpose:** Out of 44 counties in West Virginia, McDowell County ranks highest in school dropout rates and in poverty, with 49% of children living below the poverty level.1 On a national level, McDowell ranks in the worst 10% of all US counties in life expectancy and obesity.2 This study used telehealth equipment at an institution remote from McDowell County to teach life skill topics to female students in McDowell high schools. The goal of the study was to evaluate the use of telehealth to teach topics of nutrition, exercise, sleep health, and stress management to a rural underserved community.

**Methods:** Telehealth sessions were incorporated into an after school program at two McDowell high schools. Each session focused on a different topic and were taught by an individual from Marshall University with expertise on the subject. Pre-tests at the start of each session assessed nutrition, physical activity, sleep patterns, and causes of stress. Post-tests following the sessions assessed measures of self-efficacy using Likert scale responses. Six month data collection assessed changes in health behavior with repeated measures previously collected from the pre-tests. The use of telehealth equipment was also evaluated. Funding provided for this project by the Robert C. Byrd Center for Rural Health.

**Results:** 51 high school females participated in at least one telehealth session. Seventeen subjects attended the session on sleep health and stress management. The most common causes of stress cited were relationships with family, friends, school performance, and money. At the conclusion of the session 15 (88.2%) were confident they could get help if needed to manage stress, and 14 (82.3%) were confident they could deal with stress in a healthy way. The average nightly sleep among subjects was 6.7 hours. Fourteen (82.3%) reported leaving a cellphone on next to their bed, and 10 (58%) watched television within an hour of bedtime. At the conclusion of the session 16 (94%) reported confidence in making changes for healthier sleep. Forty three subjects participated in the nutrition and exercise
session. Initial nutritional assessment revealed that in an average week only 10 (23%) had at least one fruit serving and 12 (27.9%) had at least one vegetable serving per day. In an average week, 9 (21%) reported physical activity on 5 or more days, while 10 (23.3%) reported only 3 days, and 5 (11.6%) reported no days of physical activity. Sixteen (37%) reported five or more hours of screen time per day. At the conclusion of the session, 38 (88.3%) were confident they could make healthy food choices and 36 (83.7%) were confident they could increase physical activity. Sessions of stress management, sleep health, nutrition and exercise were ranked by Likert scale as “very effective” by 100%, 92.3% and 96.4% of participants, respectively. The use of telehealth equipment for teaching was ranked as “very effective” by 85.7% of subjects. Six month data assessing life skill changes is anticipated September 2015.

Conclusions: Telehealth is a promising way to provide educational health outreach to remote underserved areas.

Sources of Support:

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GENDER DIFFERENCES IN ADOLESCENTS BETWEEN SLEEP ACTIGRAPHY AND ELECTRONIC DEVICES IN THE HOME
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Purpose: Children are heavier than ever before; minority adolescents are disproportionately affected. Factors that determine a positive energy balance are still not completely understood. Current approaches of losing and maintaining body weight are ineffectual and contribute to cyclic effects of failure. Reduced sleep duration has been observed in parallel with increases in body weight. Adolescents sleep less today than just a few decades ago – possibly because of technology. Research suggests that both too much and too little sleep can lead to obesity, the reasons are far from clear. The purpose of this abstract is to examine the effects gender differences on sleep, body composition, and electronic devices in a group of adolescents.

Methods: This observational study enrolled 40 participants from the community-at-large. Participants completed 3 visits during the 2014-15 9-month academic year – avoiding daylight savings and vacation holidays. During the study participants wore a wrist actigraph for 7 nights; completed study questionnaires (socio-demographics, electronic use); and measured body composition via whole-body air displacement plethysmography. Data was analyzed for descriptive and correlations using IBM SPSS version 19.

Results: Mean age of the participants (n=40) was 14.63 + 1.3 years; 50% female; 62.5% White and 27.5% Asian. Mean number of reported electronics used daily 2.4. Thirteen percent of sample state they have a TV in their room. Mean BMI for girls and boys are 21.2 + 4.1 (range 16-30) and 20.7 + 2.9 (range 16-27), respectively. As expected, mean percent body fat (%body fat) for girls and boys are 23.9% and 13.91%, respectively. Although not significant, mean total sleep time for girls and boys are 7:04 hours and 7:25 hours, respectively. Mean wake after sleep onset (WASO; 30.17 + 11.6 and 40.7 + 11.6 minutes), sleep
onset (16.4 and 17.4 minutes), and number of awakenings (31.1 and 38.1) for girls and boys, respectively. For girls, number of electronic devices was significantly related to WASO \( r = .60, p = .05 \) and awakenings \( r = .67, p = .02 \). Also for girls only, sleep onset was significantly correlated to %body fat \( r = .734, p = .01 \). There were no significant correlations reported in boys for sleep, electronic use, or %body fat.

**Conclusions:** As expected, on average both girls and boys are sleeping much less than the recommended amount per night (8.5 – 9.25 hours). Not surprisingly, the number of electronics is numerous due to the extent adolescents rely on technology. The number of reported TV’s in an adolescent’s bedroom might not reflect watching TV on a hand held device. According to these results, girls are showing more disrupted sleep (staying awake, and waking up in the middle of the night) in relation to the number of electronic devices. In addition, girls who have a higher BMI are taking longer to fall asleep on average.

**Sources of Support:** This project was supported by the Robert Wood Johnson Foundation Nurse Faculty Scholars Program.