

Application of a Computer-Assisted Intervention and an Online Data Collection Method in Rural Adolescents with Asthma

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Purpose



- To examine the feasibility of an information technology (IT) application in the study of adolescents with asthma living in rural areas.

Background



- Asthma attacks were as common in adolescents as school-age children, 6.2% and 5.8%, respectively (Akinbami & Schoendorf, 2002).
- Adolescents were less likely to use health care services than younger children, 6.2% and 9.1%, respectively; and, asthma mortality among adolescents (4.4 per 1,000,000) was approximately twice that of younger children (Akinbami & Schoendorf, 2002).

Asthma and Risk Behaviors

- In addition to environmental triggers common in childhood asthma, adolescents with asthma must be aware of behavioral triggers (smoking, drinking, illicit drug use). Risk behaviors may interfere with asthma medications (Althuis, Sexton, & Prybylski, 1999; Gaeta, et al., 1996; Rich & Schneider, 1996; Tashkin, 2001).
- Adolescents with asthma reported more positive attitudes toward smoking, a self-image closely linked to smoking, and were more likely or as likely to smoke than their peers without asthma (Brook & Shiloh, 1993; Forrero et al., 1996; Precht et al., 2003; Tercyak, 2003; Zbikowski et al., 2002).

Risk Behaviors in Rural Adolescents



- Rural adolescents (7, 9, and 11th grades) were significantly more likely than urban or suburban youths to engage in risk behaviors such as frequent smoking (28%), alcohol use (12.3%), and use of other substances (14.4%) (Atav & Spencer, 2002).

Challenges in conducting research in rural areas

- **Costs of recruitment** (Cudney, Craig, Nichols, & Weinert, 2004; Mann, Hoke, Williams, 2005).
- **Geographic distance** (Cudney, Craig, Nichols, & Weinert, 2004; Pierce & Scherra, 2004; DiBartolo & McCrone, 2003).
- **Fewer health care resources** (Cudney, Craig, Nichols, & Weinert, 2004).
- **Inadequate transportation systems** (Anderson Loftin, Barnett, Summers Bunn, Sullivan, 2005; Cudney, Craig, Nichols, & Weinert, 2004; Pierce & Scherra, 2004).
- **Time constraints (travel)** (Lamb, Puskar, Tusaie-Mumford, 2001).

Rurality and the Internet

- The internet is a 'distance-killing' benefit for rural Americans.
- According to Pew Internet & American Life Project (Horrigan & Murray, 2006), in the end of 2005:
 - the Internet use rate for adult rural Americans was 62% compared to 70% for the rest of the United States.
 - 24% of rural Americans had high-speed Internet connections at home compared with 39% of those living elsewhere.



Internet Use in Adolescents

- Over 80% of teens reported owning a desktop or laptop computer.
- 87% of teens aged 12-17 years (21 million) used the Internet compared with 66% of adults.
- 51% of teenage Internet users said they go online on a daily basis.
- Most teens (over 80%) used the Internet at home. Teens have gone online at the library (54%) or from school (78%).

(Lenhart, Madden & Hitlin, 2005)



Internet Access from Public Libraries

- The 2006 Public Libraries and Internet Study by Information Use Management and Policy Institute (Florida State University) reported:
 - 99% of public libraries are connected to the Internet that is allowed for public use.
 - 63.3% of public libraries have connection speeds of greater than 769kbps (“high speed”).
 - Overall average number of Internet workstations is 10.7.
 - 36.7% of public libraries offered wireless Internet access.

Internet Access in Schools



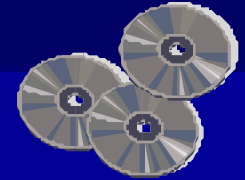
- In 2005,
 - Nearly 100% of public schools in the U.S. had access to the Internet.
 - 97% of schools with Internet access used broadband connection.
 - 45% used wireless connection.
 - The ratio of students to computers with Internet access in public schools is 3.8 to 1 (overall); 3 to 1 (rural schools).
 - 12% of rural public schools lend laptop computers to students compared with 7% of city schools.

(National Center for Education Statistics, 2006).

Study Procedures

Study Entry		
↓		
RANDOMIZATION		
	INTERVENTION GROUP (n=20)	CONTROL GROUP (n=21)
Baseline Assessment at Enrollment	* Full battery * Cognitive scale * Medical Chart Review	Same Same Same
Intervention at Baseline Contact	* 2 CD-ROMs (DM, Risk Behaviors) * Risk Behavior Facts Sheet Exit interview and Debriefing	Neutral CD-ROM ("study skills") None Same
2-month Contact	* Abbreviated Battery (online) * Repeated DM CD-ROM * Workbook assignment Compliance Telephone Call	* Abbreviated Battery (online) None None None
4-month Contact	* Abbreviated Battery (online) * Interactive CD-ROM (Risk behaviors) Compliance Telephone Call	* Abbreviated Battery (online) None None
6-month Contact	* Abbreviated Battery (online) Medical Chart Review Exit Interview	* Abbreviated Battery (online) Same Same

Intervention Using CD-ROMs



Laptop CD-ROM Programs

- Decision-making tutorial (20 min)
- Substance use prevention tutorial (30min)

Intervention Booster (“e-booster”)

At 2-month contact:

- Repeat the Decision-Making Tutorial CD-ROM (20 minutes)

At 4-month contact

- Interactive CD-ROM of substance use context (30 minutes)

Study Sites and Sample

Research Sites

- Orange Pediatrics (n=5)
- Blue Ridge Medical Center (n=8)
- Madison Family Practice (n=5)
- JABA Allergy and Asthma Clinic (n=5)
- Louisa High School (n=19)

Sample Size: 41 (intervention=20, control=21)

4 Dropouts: 2 at 2-months
 1 at 3-months
 1 at 6-months

Demographic Characteristics of the Sample

- Age
 - 14 – 19 years (mean=16, SD=1.53)
- Gender
 - Female: n=28 (68.3%)
 - Male: n=13 (31.7%)
- Race
 - Whites, n=26 (63.4%)
 - Blacks, n=12 (29.3%)
 - Hispanic, n=1 (2.4%)
 - American Indians, n=1 (2.4%)
 - Other, n=1 (2.4%)

Demographic Characteristics of the Sample (cont'd)

■ Family Income, n (%)

– < \$10,000,	11 (26.8)
– \$10,000 ≤ and < \$30,000,	8 (19.5)
– \$30,000 ≤ and < \$40,000,	4 (9.8)
– \$40,000 ≤ and < \$50,000,	1 (2.4)
– \$50,000 ≤ and < \$60,000,	4 (9.8)
– ≤ \$60,000,	8 (19.5)
– Missing,	5 (12.2)

Demographics of Online Users

- Teen participants from families with annual income of \$30,000 or more were more likely to submit data online (75%) compared with those less than \$30,000 (52%).
- Comparable rates of online submission in males (69%) and females (58%) and Whites (62%) and Non-Whites (60%).

Results: Feasibility of the CD-ROM Intervention

- The intervention was well received by 100% of the participants in the intervention group. The majority (80%) also reported they could explain the decision-making theory to others.
- The booster intervention (mailed CD-ROMs) was implemented at home without major technical issues.
 - Initial “cookie” problem
 - Dial-up service
 - CD-ROM download too large



Results: Online follow-up by study participants

- 24 (62%) of teens submitted follow-up data online for at least one timepoint
 - Of those, 18 (75%) submitted follow-up data online for all 3 timepoints.
- Of the 15 teens (38%) who never used the online questionnaires during the study, 10 were from the school setting.



Conclusions: Benefits of IT Application in Pilot Study



- Provided teens with flexibility in time and place (e.g., time to follow all paths on interactive CD-ROM)
- Reduced researchers' transportation time and mileage
- Reduced printing costs
- Reduced data entry time and errors
- Enhanced safety of data by avoiding mail
- Saved cabinet space to store hardcopy data

Implications for Future Studies


- Use library and school computers with online access.
 - Provide orientation to library or school computers for teens without home access.
- Motivate teens to access online.
 - Suggestions:
 - Make the study website more interesting and attractive
 - Incentives for online use
 - Follow-up phone calls important
- Eliminate delayed payment for on-line completion.
- Write Internet access fees into grant proposals for teens with home computers but no internet access.
- Use cell phone/text message reminders at timepoints.

Teen Asthma Study Homepage - Windows Internet Explorer

Address bar: C:\Documents and Settings\Melissa Sutherland\Desktop\Teen Asthma Study Homepage.1.mht

University of Virginia School of Nursing

Teen Asthma Study



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Teen Survivorship Study Home Page - Windows Internet Explorer

Address bar: http://tss.nursing.virginia.edu/

TSS Teen Survivorship Study

TSS is sponsored by a research grant from NIH, National Institutes of Health

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