

A Web-Based Intervention for Elementary School Teachers of Students With Attention-Deficit/Hyperactivity Disorder (ADHD)

Brittany Barnett
Dalhousie University

Penny Corkum
Dalhousie University and Colchester East Hants
ADHD Clinic, Truro, Nova Scotia, Canada

Nezihe Elik
Mount Saint Vincent University

The goal of the present study was to determine whether a web-based medium is an effective tool for supporting knowledge, attitude, and behavior change in teachers of elementary school children with attention-deficit/hyperactivity disorder (ADHD). Nineteen teachers from Nova Scotia, Canada completed a 7-week intervention that consisted of presentations, web links, and discussion board activities related to different aspects of ADHD. Teachers' knowledge positively changed from pre- to post-intervention ($p = .03$), as did teachers' attitudes related to perceived control in their classrooms ($p = .001$) and competence in teaching ($p < .0001$). The study demonstrated that a web-based medium is a useful tool for knowledge creation and translation and has potential as a means of providing professional development to teachers about ADHD.

Keywords: attention-deficit/hyperactivity disorder (ADHD), eLearning, knowledge and attitudes, school intervention, children

Name of Institution

A pilot study evaluating a web-based intervention for elementary school teachers of stu-

dents with ADHD took place at Dalhousie University (Halifax, Nova Scotia).

Service Delivered

ADHD is estimated to affect at least one child in every elementary school classroom (Barkley, 1998). Changing teachers' knowledge and attitudes can lead to a change in the strategies teachers use in the classroom (Kos, 2008; Scuitto, Tejereson, & Bender-Frank, 2000). There are no published Web-based studies that attempt to provide intervention to change teachers' knowledge and opinions of ADHD and, therefore, the current study used a learning management system (LMS) to host an online educational intervention. The primary research question for this study was: *Would a Web-based learning site be effective in supporting knowledge, attitude, and behavioral change in elementary school teachers of students with ADHD?* In order to assess change, the current study measured knowledge, attitudes, and behaviors before and after the Web-based intervention program. We also monitored and recorded internal activity on the Web site and collected satisfaction ratings from the teachers.

This article was published Online First December 12, 2011.

Brittany Barnett, Health Informatics Program, Dalhousie University, Halifax, Nova Scotia, Canada; Penny Corkum, Department of Psychology, Dalhousie University, and Colchester East Hants ADHD Clinic, Truro, Nova Scotia, Canada; Nezihe Elik, Faculty of Education, Mount Saint Vincent University, Halifax, Nova Scotia, Canada.

Brittany Barnett is now at Guelph General Hospital, Guelph, Ontario, Canada. Nezihe Elik is now at Hamilton Health Sciences, Hamilton, Ontario, Canada.

We would like to thank the Chignecto-Central Regional School Board (CCRSB) for their support of this program, the elementary school teachers who participated in this research, and the Nova Scotia Health Research Foundation for assistance with some of the associated costs. Special acknowledgment is given to Natalie McInnis and Cheryl Johnson of the CCRSB for their valuable feedback and assistance with program development and organization, as well as recruitment. This report is based on a master's thesis by Brittany Barnett. Further details are provided at <http://dalspace.library.dal.ca/bitstream/handle/10222/13013/Barnett,%20Brittany,%20MHI,%20HINF,%20August%202010.pdf?sequence=1>

Correspondence concerning this article should be addressed to Penny Corkum, Department of Psychology, Dalhousie University, 1355 Oxford Street, PO Box 15000, Halifax, Nova Scotia, Canada, B3H 4R2. E-mail: penny.corkum@dal.ca

The teachers had to complete one session each per week for seven weeks. Each session consisted of PowerPoint presentations, Web-links, and discussion board activities related to different aspects of ADHD. Teachers spent approximately 30–60 minutes per week on the site.

Types of Professionals Involved

The study was conducted by a graduate student in Health Informatics (Barnett). The intervention was developed by two registered child clinical and school psychologists who specialize in ADHD (Corkum and Elik) and provided supervision for this research project. All participants were teachers of elementary school-age children.

Training for Telemental Services of Professional(S) Involved

Participants were given access to the Web site prior to the intervention in order to become familiar with the Web site functions. They also had access to an online manual describing how to navigate the Web site and how to use the various functions. Problems with using the Web site could be addressed to the principal investigator.

Population(s) Served

Research ethics board approval was received from Dalhousie University and from the school board. Prior to beginning the study, teachers provided informed consent. The study sample included 19 elementary school teachers. Participants were recruited through word of mouth. All participants were female (no male teachers requested to participate). Participants ranged in age from 25–55 years ($M = 36.88$, $SD = 9.25$). The majority of participants were full-time classroom teachers ($n = 14$), with the others being part-time classroom teachers ($n = 3$), a learning center teacher ($n = 1$), and an educational assistant ($n = 1$). All participants completed the entire program.

Geographic Location Served

Participants were recruited primarily from one school board in Nova Scotia (NS). The

school board is located in a rural area of NS and many schools are geographically removed from treatment centers and, therefore, accessibility to workshops about ADHD is limited.

Funding Sources

Participation was voluntary; no monetary compensation was provided to participants, although they were provided with a book about ADHD upon study completion as a thank you for their involvement with the research. Partial funding for the study was provided through a grant from Nova Scotia Health Research Foundation.

Technology Used

An integrated LMS (i.e., Blackboard Learning System) was used as the platform to host this pilot study. Various tools were enabled, such as the use of a Discussion Board, intrasystem e-mail, assessments, and Web links. Knowledge, attitudes, and behavior were measured pre- and post-intervention through teachers completing self-report measures. After the intervention, the teachers reported increased knowledge of ADHD as well as rated themselves as more in control and having higher competence in regard to managing ADHD in their classrooms. There were no changes in reports of teaching behaviors. We also collected internal site activity and found that most participants were maximizing the tools and functionalities of the Web-based learning site. For example, the average number of Discussion Board messages read was 326.05 ($SD = 341.50$), the average number of Discussion Board messages sent was 8.47 ($SD = 5.86$), the average number of Web links accessed was 26.84 ($SD = 20.98$), and the average number of files accessed was 44.26 ($SD = 24.33$). Satisfaction data indicated that all sessions were rated highly (satisfaction ratings for all 7 sessions $> 3.0/4.0$) and that the general program was very well received (satisfaction ratings = $3.7/4.0$).

Technology Choices That Would Be Different Next Time And Why

For future program implementations, the authors would recommend using a LMS again, but

would utilize more advanced features. Such features might include a chat room for live group discussion, the addition of a moderator on the Discussion Board to help direct conversation, and the use of e-learning development software to create more sophisticated learning modules (e.g., use of videos and audio-overlay). Additional e-learning applications (e.g., assessment creation and delivery tools) would also allow for more robust data collection and analysis.

Biggest Challenge(s)

Aside from methodological limitations pertaining to the study itself (e.g., lack of a control group, small sample size, self-report of assessments), certain technological limitations were also evident. Based on the results of the current study, recommendations for future research include the inclusion of additional functionalities into the Web-based learning site such as a moderator for the discussion board, chat room, and enhanced content presentation (e.g., videos of successful program implementation). It is hoped that these additions would facilitate a change in teachers' strategies.

Biggest Success(es)

The current study has demonstrated the preliminary effectiveness of a Web-based intervention for changing teachers' knowledge about ADHD and attitudes toward ADHD. The study also demonstrated the usability and usefulness of the Web-based site as a medium for an educational intervention, and highlights opportunities for the use of Web-based learning for professional development for teachers. The results of the current study, along with past research (e.g., Huang & Liaw, 2004), indicate that Web-based learning should be considered as a useful alternative to workshop-based professional development, as it is easily accessible, is capable of hosting large quantities of people, and provides users with timely access to information (Ritterband et al., 2003; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004).

Lesson(s) Learned

The results of the current study and past studies (e.g., Edwards et al., 2010) demon-

strate opportunities for the use of Web-based learning for educational interventions and professional development. Based on the internal site activity data and post-session and poststudy satisfaction questionnaires, teachers found the site to be a useful and usable mode of learning about ADHD. Based on the feedback provided by participants, we are able to suggest ways in which learning tools can support future online professional development opportunities for teachers of students with ADHD. The results of this pilot study form the foundation of a larger upcoming randomized controlled trial, which will evaluate the efficacy of the above-described intervention in improving teachers' knowledge and attitudes and student functioning in actual classrooms. The limitations and recommendations that were generated based on this pilot study were taken into consideration to improve the methodology for the upcoming study. The current pilot project has offered insight into how teachers' knowledge and attitudes about ADHD can be changed as a result of a Web-based intervention.

References

- Barkley, R. (1998). *Attention Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment*. New York, NY: Guilford Press.
- Edwards, P., Felix, L., Harris, J., Ferguson, E., Free, C., Landon, J., . . . Murray, E. (2010). Assessing the effectiveness and cost effectiveness of adaptive e-Learning to improve dietary behavior: Protocol for a systematic review. *BMC Public Health, 10*, 200. doi:10.1186/1471-2458-10-200
- Huang, H., & Liaw, S. (2004). The framework of knowledge creation for online learning environments. *Canadian Journal of Learning and Technology, 30*, (1). <http://www.cjlt.ca/index.php/cjlt/article/viewArticle/119/113>
- Kos, J. (2008, September). What do teachers know, think and intend to do about ADHD? *Teaching and Learning and Leadership*. Paper presented at the European Conference on Educational Research, Göteborg, Sweden. http://research.acer.edu.au/tl_misc/9
- Ritterband, L., Gonder-Frederick, D., Cox, D., Clifton, A., West, R., & Borowitz, S. (2003). Internet interventions: In review, in use, and into the future. *Professional Psychology: Research and Practice, 34*, 527–534. doi:10.1037/0735-7028.34.5.527

- Scuitto, M., Tejereson, M., & Bender Frank, A. (2000). Teachers' knowledge and misperceptions of Attention Deficit/Hyperactivity Disorder. *Psychology in the Schools, 37*, 115–122.
- Wantland, D., Portillo, C., Holzemer, W., Slaughter, R., & McGhee, E. (2004). The effectiveness of web-based vs. non-web-based interventions: A

meta-analysis of behavioural change outcomes. *Journal of Medical Internal Research, 6*(4): e40.

Received February 1, 2011

Revision received August 9, 2011

Accepted August 17, 2011 ■