Running Head:
Mental Illness Web Training

January 2011: In press; Journal of the American Medical Directors Association

Mental Illness Training for Long Term Care Staff

By
A. Blair Irvine[1], Molly B. Billow[1], Michelle Bourgeois[2], & John R. Seeley[3]

Key words: Mental Illness, Internet training, Nurse Aides, long term care, Nurses, license

1 Oregon Center for Applied Science, 260 E. 11th Avenue, Eugene, OR 97401
2 Ohio State University, 103 Pressey Hall, Columbus, OH 43210
3 Oregon Research Institute, 1715 Franklin Blvd., Eugene, OR 97403

Abstract

Objectives: Mental illness is prevalent among nursing home residents, but staff are not well trained to deal with it. This research evaluated an Internet mental illness training program designed for certified direct care workers (i.e., Nurse Aides (NAs)). Pilot research was also conducted to explore effects and acceptance of the same program with a sample of Licensed Health Professionals (LHPs).

Design: Trial 1: Pre-post randomized treatment and control design for NAs; Trial 2: Quasi-experimental pre-post within-subjects design for LHPs.

Setting: Both studies were conducted on the Internet.

Participants: Trial 1: N=62 NAs; Trial 2: N=16 LHPs

Intervention: Internet-based behavioral skills training and knowledge building, using video modeling with mastery learning instructional design.

Measurements: Video situations testing and assessment of psycho-social constructs associated with behavior change; follow-up interviews with a sample of treatment NAs.

Results: Trial 1: MANCOVA analysis showed positive results (p=.003) for knowledge, attitudes, self efficacy, and behavioral intention, with medium-large effect sizes. The training was well received by the users. Trial 2: Paired t-tests showed significant effects on five of six outcome measures, with medium-large effect sizes, and it was well received by the LHP sample.

Conclusions: Internet training can be an effective approach to help staff work with residents with mental illness. In this research, it showed significant positive effects and was well received by NAs and by LHPs.

Introduction

A total of 3.2 million individuals[1] reside in long term care facilities (LTCs). The reported prevalence of mental disorders among this population varies with the research designs and interests of the researchers,[2] ranging from 22%[3] to 90%.[4, 5] Depression alone may affect 17%[6, 7] to 30%,[8] with less than half of LTC residents being diagnosed and treated.[6] The Center for Medicare and Medicaid Services[1] reports that 68% of LTC residents have cognitive impairment, with 41% showing moderate-severe impairment on the Cognitive Performance Scale.[9] Dementia may be linked to challenging behaviors and assaults by residents,[8, 10-16] and up to 90% of patients with dementia are thought to have psychiatric co-morbidities.[17-19] Comorbidity between dementia and depression, delusions, and hallucinations had the highest correlations with aggressive resident behaviors in one study.[20] The percentage of younger individuals (i.e., 21-65 years of age) in LTCs has grown from 11.1% in 1999 to 13.6% in 2008,[1] and they are often undiagnosed and without adequate treatment for mental illness.[21-23] To further complicate potential resident behaviors, 47.9% of LTC residents were reported to have taken nine or more medications the day before the facility interview for the National Nursing Home Survey,[3] making them potentially at risk for adverse events due to overuse of medications.[24]

Despite the high incidence of psychiatric disorders in LTCs, NAs usually receive little or no training to work with dementia or other mental illnesses,[2, 23, 25-30] which undermines their capabilities to react appropriately if confronted with mental illness behaviors.[2, 25, 31, 32] Negative stereotypes[33, 34] increase the likelihood that staff will fear or avoid residents with mental illness,[2, 35] which in turn erodes the quality of resident care. As a result, mental illness is too often treated with psychotropic medications or restraint,[36-38] and behavioral methods are under-utilized by care giving staff.[37, 39, 40]

LHPs (e.g., RNs, LPNs, Physical Therapists, Social Workers) are also likely to have direct contact with LTC residents with mental illnesses. Inadequately trained in both geriatrics and mental

illness.[2, 25, 41-44] LHPs may thus be hard pressed to supervise NAs dealing with behaviors caused by mental illness, or to know how to react themselves when encountering challenging behaviors. Lacking adequate training, LHPs may be subject to the same types of stigmas and ill-suited behavioral reactions as may be shown by inadequately trained NAs.

Previous research has shown the efficacy of interactive training for NAs using interactive computer programs[45-48] and on the Internet.[46, 49] The research described here was funded by the National Institute on Aging to develop a prototype Internet training program to provide NAs with education and theoretically sound behavioral training to work with LTC residents with psychiatric disorders. It was to be tested in a randomized evaluation. Given the lack of geriatric and mental health preparation of LHPs,[2, 25, 31, 42, 44] but without resources to conduct a second randomized study, we conducted a separate pilot study to assess the impact on, and acceptance of, the same training website by LHPs.

This study addressed the following research questions:

- As demonstrated by responses to questions following the viewing of video simulations of challenging workplace situations, to what extent will users of an Internet training program demonstrate that they have learned appropriate behavioral and communication techniques for working with residents who display behaviors apparently caused by a mental illness?

- To what extent will users' knowledge of mental illness be improved by the training?

- To what extent will users' attitudes, self-efficacy, and behavioral intentions regarding resident behaviors caused by a mental illness positively change as a result of program use?

- How satisfied will users be with an Internet training approach?

- Will nurses and other licensed staff benefit from and accept a training program designed for NAs?

Methods

Overview

To test program efficacy, we conducted "real-world" effectiveness studies[50] via the Internet with two

subject populations:

Trial 1: The program was evaluated in a randomized pretest/posttest trial with a sample of the

intended target audience: NAs working in LTCs;

Trial 2: A convenience sample of LHPs was tested using a within-subjects design as pilot research

to examine the potential applicability of the training to other care worker populations.

With the help of LTC consultants, researchers, and mental health therapist, we developed a

behaviorally focused Internet training program. Video modeling vignettes, testimonials, and narration

supplemented by short on-screen text statements written at the 2nd – 6th grade reading level were

designed to emphasize teaching points and create empathy for residents with mental illness. The over-

reaching philosophy of person-centered care[36, 37, 51, 52] was emphasized in the instructional design. That

is, the instructional model focuses on respect for the values and needs of the resident. NA models in the

program are always respectful, attempting to: (a) interpret a situation from the resident's perspective, (b)

verbally empathize with the resident without condemnation, and (c) use knowledge of the resident or the

resident's care plan as part of a positively oriented non-punitive redirection strategy. The training

focused on helping the resident develop the skills and confidence to deal with whatever behavior was

being presented, regardless of what mental illness was causing the behavior.

The Internet Program: *Caring Skills: Working with Mental Illness*

The first module, guided by a video narrator, introduces the topic of mental health and presents short descriptions of common mental disorders (i.e., anxiety disorders, schizophrenia & psychotic disorders, mood disorders, cognitive disorders, and personality disorders). For each short description, an interested user may click on a "More Details" button to see a more sophisticated article about the characteristics and consequences of that disorder. The reading level of these optional articles is 10th grade or less.

A second module is designed to dispel common myths about mental illness (e.g., "Residents with mental illness are often violent."; "Mental illness cannot affect me."). It presents a total of eight statements about mental illness, which were derived from the NIMH and other mental health organization websites. For each statement, the user is instructed to click on icons indicating whether the statement is a myth or a fact. An animated screen provides feedback about whether the choice was correct or incorrect, while voice-over narration and text reinforce the facts and dispel myths.

The third module uses video vignettes and testimonial stories to demonstrate how NAs can gain information to help build a relationship with their resident (i.e., talking to the resident, to family, and to other staff). It describes, and video-models demonstrate how a positive NA-resident relationship promotes friendly interactions and helps the NA recognize potential behavioral triggers, and how to implement solutions that the resident will accept.

A fourth module presents a behavioral strategy for working with a resident exhibiting potentially problematic behaviors apparently caused by a mental illness (e.g., paranoia, hallucinations). Video vignettes supplemented by narration and text and supportive testimonials from NA video-models demonstrate fundamental techniques using the Assess-Investigate-Do something (AID) approach, which was previously developed by the research team.[46]

A final module gives the program users an opportunity for skill building practice in a mastery learning instructional design. In a new video vignette depicting a problematic resident behavior (i.e., agitated resident hallucinates that bugs are on her), the NA-model reacts with either appropriate (e.g., pauses to assess, friendly greeting) or inappropriate responses (e.g., begins to lose patience, inappropriate redirection attempt). The program user is then asked a series of multiple choice questions about the appropriateness of the NA's behavior. Correct answers are praised, and incorrect answers are remediated with an explanation of why they are incorrect. When all the questions have been answered, the vignette is replayed and incorrectly answered questions are presented again, with the same remediation as before. When all the questions have been answered correctly, or when the re-questioning cycle has been repeated two times, the program moves on, and the user is shown a modeling vignette of how to deal more appropriately with the same situation (e.g., stay calm; show empathy; use knowledge of the resident, and redirect to specific activity that the resident will like).

Procedures

Recruitment procedures for research subjects have been described in detail elsewhere.[46] In brief, after the protocol was approved by an Institutional Review Board, participants were recruited via Internet advertisements and word of mouth referrals. Potential participants visited an informational website and then were screened on-line to verify their employment in an LTC setting, their job type (e.g., NA, LHP), that they had had recent contact with residents with symptoms of mental illness, and if they had access to a computer with broadband capability and a current email address. The advertising was successful, as demonstrated by 517 hits to the informational web site. A total of 412 people linked to the online screening questionnaire to attempt to qualify for the study.

For Trial 1, qualified NAs were randomized into Treatment or Control conditions. Participants were then emailed a link to an online Informed Consent. Those who agreed to the Consent were linked

to an online pretest assessment (T1). After submitting the T1 assessment, Treatment Group participants were linked to the Internet training program and were instructed to view all parts of the program. Treatment Group participants were emailed a link to the posttest online assessment (T2) one business day after viewing at least part of the training program. Control Group participants were emailed the link to the T2 assessment one business day after completing the T1 assessment. The surveys took 20-30 minutes to complete. Once participants submitted both assessments, they were mailed a check for $80. A volunteer sample of Treatment Group NAs participated in telephone interviews after the T2 assessment, and they were then mailed a check for $25.

For Trial 2, a convenience sample of LHPs was recruited on-line and screened-in as described above. They followed the Treatment Group protocol above, and were mailed a check for $80 after completing both assessments. No Control Group of LHPs was recruited.

Participants

As shown in Table 1, the Trial 1 sample of NAs (N=70) was predominantly female (93%), fully employed (77%), had <4 years of NA experience (66%), had at least graduated from high school (99%), and were >35 years of age (57%). Trial 2 participants (N=16) included 5 Registered Nurses, 5 Licensed Practical Nurses, 3 Licensed Social Workers, and 3 Activity Therapists. They were primarily females, tended to work more than 30 hours per week, had at least 6 years of professional experience, and half of them were 46-55 years of age.

Table 1. Demographic Information Nurse Aides (NA) and Licensed Health Professionals (LHP)

Variable	NAs (n=70)		Treatment (n=36)		Control (n=34)		LHPs (N=16)	
	N	%	N	%	N	%	N	%
Age								
18-20	2	2.9	2	5.6				
21-35	38	54.3	16	44.4	22	64.7	4	25
36-45	18	25.7	10	27.8	8	23.5	4	25
46-55	10	14.3	8	22.2	2	5.9	8	50
Over 55	2	2.9			2	5.9		
Gender								
Male	5	7.1			5	14.7	1	6.3
Female	65	92.9	36	100	29	85.3	15	93.7
Race								
African American	25	35.7	13	36.1	12	35.3		
Asian American								
Caucasian	43	61.4	22	61.1	21	61.8	16	100
Latino/Hispanic	1	1.4			1	2.9		

Other	1	1.4	1	2.8				
Education								
Grade school or less	1	1.4			1	2.9		
Some High School								
High School Graduate	13	18.6	9	25.0	4	11.8		
Some College	31	44.3	18	50.0	13	38.2	2	12.5
College Graduate	19	27.1	7	19.4	12	35.3	12	75
Graduate/ Professional	4	5.7	2	5.6	2	5.9	2	12.5
Trade School	2	2.9			2	5.9		
Hours Worked per Week								
Less than 10 hours								
10 to 20 hours	4	5.7	1	2.8	3	8.8	1	6.3
21 to 30 hours	12	17.1	5	13.9	7	20.6	2	12.5
31 to 40 hours	32	45.7	17	47.2	15	44.1	4	25
40 plus hours	22	31.4	13	36.1	9	26.5	9	56.3
Family Income								

Less than $10,000	3	4.3	1	2.9	2	5.9		
$10,000 - $20,000	7	10.1	3	8.6	4	11.8	1	6.3
$20,000 - $40,000	31	44.9	15	42.9	16	47.1	5	31.3
$40,000 - $60,000	15	21.7	10	28.6	5	14.7	5	31.3
More than $60,000	13	18.8	6	17.1	7	20.6	5	31.3
NA Experience								
2-6 months	3	4.3			3	8.8		
7-12 months	1	1.4			1	2.9		
1-3 years	20	28.6	11	30.6	9	26.5	1	6.3
4-10 years	35	50.0	20	55.6	15	44.1	2	12.5
More than 10 years	11	15.7	5	13.9	6	17.6	13	81.3

Note: NA = nursing assistant

Measures

NA-participants (Trial 1) and the LHPs (Trial 2) responded to identical on-screen assessments at T1 and T2. Assessment items were designed to measure situational learning, knowledge, attitude, self efficacy, behavioral intentions and program acceptance.

Situational testing studies involve presenting test-takers with realistic hypothetical scenarios and asking them to identify appropriate responses. This assessment approach is useful when in vitro observations are not practical, and it has been conducted as video situational tests (VSTs) with NAs.[45, 46] VSTs used in this research, comprised four short video vignettes: VST-1: an agitated and confused resident grabs another resident forcefully; VST-2: resident expresses paranoia and fear; VST-3: resident thinks bugs are crawling on her; and VST-4: a resident who appears to feel down and depressed. Each VST scene was followed by a self-efficacy item stating "If you were faced with the situation just shown, how confident are you that you would know what to do?" Participants rated their responses on a on-screen 5-point Likert scale ranging from "Not at all confident" to "Extremely confident". Subjects then responded to a single multiple choice question testing knowledge of: what action to take first for VST-1, what to say first for VST-2, what to do or say to stop the paranoid behavior in VST-3, and what to do to change the depressed behavior in VST-4.

A battery of psychosocial assessment items then measured changes in constructs associated with social cognitive theory[53, 54] and the expanded theory of reasoned action,[55] including attitudes, self-efficacy, and behavioral intentions. The items addressed attitudes about mental illness, working with agitated residents, and the importance of specific behavioral responses to different types of situations. The participants' knowledge of mental illness was tested by asking them to differentiate myths from facts about mental illness. These items included 3 response choices (i.e., myth, fact, not sure). Self-efficacy items were presented on a 7-point rating scale (i.e., 1 not at all confident; 7 extremely

confident). These items addressed the subject's self-confidence to perform specific behavioral responses when faced with a challenging resident behavior by asking: "If you wanted to, how confident are you in your ability to….?"   Behavioral intention items were presented as questions about the subject's intention to perform specific behavior when dealing with a situation related to a mental illness. The items were rated on a 7-point rating scale (i.e., 1 not at all likely; 7 extremely likely), and the subject was asked "With resident behavior that is caused by a mental illness, how likely is it that you will…"

Program acceptance was assessed at T2 for the NA Treatment Group (Trial 1) and the LHPs (Trial 2) with 12 items. A total of 8 agree-disagree Likert-type items (1 strongly disagree to 5 strongly agree) were adapted from Website acceptability measures.[56, 57] Participants also were asked to rate the training program (1 not at all to 7 extremely positive) in terms of helpfulness, enjoy-ability, recommend-ability, and satisfaction. An additional single item requested typed-in feedback about the program and suggestions for how to improve it.

Finally, a convenience sample of Trial 1 Treatment Group NA-volunteers was interviewed by telephone after their submission of the T2 assessment. Participants were asked about their work-experience with residents with mental illness, and what they remembered about the training website. Then they were asked about their perceptions of the value of the training to them as they subsequently worked with residents. LHPs were not interviewed due to funding limitations.

<div align="center">Results</div>

Program Effects

Trial 1. One evaluation goal was to examine gains by Treatment subjects (N=34) following program use, compared to Control subjects (N=33) on the targeted theoretical constructs. These constructs included: (a) VST knowledge, (b) VST self-efficacy, (c) knowledge of myths vs. facts, (d) attitudes, (e) self-efficacy, and (f) behavioral intentions. Multivariate analysis of covariance

(MANCOVA) comparing the two conditions was conducted on the six posttest outcome measures, with pretest outcome measures included as covariates. An overall multivariate model was tested followed by six univariate models. The multivariate test was significant. Treatment participants were found to have significant and large gains compared to the Control participants, $F (6, 54) = 3.86$, $p = .003$, partial eta-square = .30, which is a large effect size. Effect size computations complement inferential statistics (i.e., p-values) by estimating the strength of the relationship of variables in a statistical population; partial eta-square .01 = small, .06 = medium, and .14 = large.

Treatment participants differed significantly from the Control participants on five of the six posttest measures (Table 2). The greatest gains were obtained for attitudes about mental illness (eta-square = .157, large effect size), followed by myths about mental illness (eta-square = .117, moderately large effect size), VST knowledge regarding appropriate action to take based on the video scenario presented (eta-square = .072; medium effect size), intention to perform specific behavioral responses in dealing with mentally ill patients (eta-square = .071, medium effect size), and VST self-efficacy regarding perceived self-confidence about taking appropriate action based on the video scenario presented (eta-square = .064; medium effect size). In sum, significant and medium-to-large effects were obtained on five of the six outcome measures providing strong support for the efficacy of the program.

Table 2. Pre-Post Descriptive Statistics and ANCOVA Results for the Six Outcome Measures for the NA Sample

Outcome measure / Condition	Pre-Test		Post-Test		Condition Effect		
	M	SD	M	SD	F-test	p-value	Eta^2
VST knowledge					4.56	.037	.072
Treatment	1.71	1.00	2.38	0.89			
Control	1.70	0.88	1.88	0.82			
VST self-efficacy					4.01	.050	.064
Treatment	3.82	0.72	4.28	0.56			

Control	3.73	0.60	3.99	0.62			
Myths					7.84	.007	.117
Treatment	8.38	1.76	9.65	1.25			
Control	8.82	1.59	8.94	1.35			
Attitudes					11.00	.002	.157
Treatment	4.99	0.40	5.57	0.58			
Control	4.92	0.51	5.09	0.51			
Self-efficacy					0.38	.541	.006
Treatment	5.95	0.73	6.23	0.68			
Control	5.79	0.69	6.02	0.66			
Behavioral intention					4.49	.038	.071
Treatment	6.07	0.72	6.37	0.63			
Control	5.88	0.66	6.03	0.69			

Note. N = 67; 34 Treatment and 33 Control participants. Multivariate $F_{(6, 54)}$ = 3.86, p = .003, partial eta-square = .30. Univariate F-test df = 1, 59. Eta-square of .01, .06, and .14 are considered small, medium, large effect sizes, respectively.[58]

Trial 2. To test the efficacy of the training program among the LHP sample, pre-post paired t-tests were conducted on the six outcome measures. Table 3 presents the pre- and post-training means and standard deviations as well as the paired t-test results and effect sizes (partial point-biserial r)[59] for the outcome measures; partial point biserial r .14 = small; .36 = medium; and .51 = large As can be seen, significant effects were obtained in the predicted direction for the pre-post comparisons across all outcome measures with the exception of a trend-level effect for VST knowledge. Large effect sizes were obtained for VST self-efficacy, attitudes, general self-efficacy, and behavioral intention; medium effect sizes were obtained for VST knowledge and myths.

Table 3. Pre- and Post-Training Descriptive Statistics and Paired t-test Results on Outcome Measures for the LHP Sample (N = 16)

Outcome measure	Pre-Training	Post-training	t	p-value	Effect

	M	*SD*	*M*	*SD*			Size
VST Knowledge	1.88	1.00	2.44	0.89	1.86	.083	0.43
VST Self-efficacy	3.69	0.74	4.18	0.60	4.44	<.001	0.75
Myths	9.44	0.96	10.06	0.85	2.18	.046	0.49
Attitudes	5.13	0.27	5.80	0.57	5.72	<.001	0.83
Self-efficacy	5.64	0.80	6.17	0.66	4.69	<.001	0.77
Behavioral intention	6.10	0.58	6.35	0.63	2.65	.018	0.56

Note. Effect size is being reported as a partial point-biserial r: small = .14; medium =.36; large = .51.[59]

User acceptance

Participant responses were very favorable regarding the website design (see Table 4). NAs rated the web site at more than 6 on a 7-point Likert scale on satisfaction and related categories. Responses about the usability and credibility of the website were also very favorable. Responses from LHPs were also uniformly positive, although consistently slightly less than those of the NAs.

Table 4. Website usability and acceptability ratings by NA Treatment Group and LHPs

	NAs	LHPs
Item (1 Negative - 5 Positive)	Mean (SD)	Mean (SD)
" The website has much that is of interest to me."	4.44 (.61)	4.31 (.60)
"Using the website was a waste of my time." [reverse scoring]	1.36 (.64)	1.53 (.63)
"I would imagine that most people would learn to use the website quickly."	4.40 (.67)	4.06 (.85)
"The website needs more introductory explanation." [reverse scoring]	1.92 (.81)	2.19 (1.05)
"I like how the website guided me through each page."	4.31 (.71)	4.19 (.91)
"I wish I could move to different sections of the website more freely." [reverse scoring]	2.78 (1.07)	2.87 (1.15)

"The video situations in the website are believable."	4.46 (.58)	4.31 (.70)
"The website is attractive and appealing."	4.35 (.60)	4.13 (.62)
Satisfaction with website (1 Negative -7 Positive)		
How satisfied were you with it	6.06 (1.04)	5.63 (1.15)
How helpful was it?	6.29 (1.27)	5.56 (1.50)
How enjoyable was it to use?	5.84 (1.20)	5.31 (1.40)
Would you recommend it to others?	6.04 (1.26)	5.75 (1.24)

Qualitative comments

The evaluation instrument provided users with an opportunity to offer typed-in comments about improving the program. A total of 26 NAs offered comments which were consistently positive. Twenty four of the NAs had positive opinions about the website's functionality, including one who stated "My six year old son watched the video with me. He was able to navigate through the website and answer the questions." Six suggestions for improvements included calls for expanded training content with more video scenarios, and greater freedom to move within the program. Eleven LHPs offered feedback. It included 10 positive statements, and 10 constructive suggestions, mostly about additional features that might be added. No negative comments were received from either group.

Telephone calls to 11 Treatment Group NAs averaged 25 minutes in length and occurred an average of 11 days (SD 9.09) after use of the program. The training program continued to be valued more than two weeks after it was viewed. Four interviewees reported using the A.I.D. strategy at work, and six others mentioned using elements of the A.I.D. approach. Several interviewees indicated that they previously lacked the type of training presented in our Internet training program.

Discussion

This research successfully developed an Internet training program that increased NA's confidence and skills to work with LTC residents with mental illness. In parallel, we believe that it may have reduced the stigma of mental illness (NIMH 2010) for them by improving their factual knowledge and attitudes about mental illness.[43] Typed-in comments and subsequent telephone interviews suggested broad acceptance of the program, and that some NAs were using recommended techniques with residents. In sum, results suggest that the training was effective, well received by the NAs, and that recommended techniques were generalizable into the LTC setting. We believe that this type of computerized instruction offers a valuable training adjunct, and that it could be part of each new-employee orientation, thus establishing normative expectations for caregiving behaviors at a LTC.

Program effects on LHPs were also positive. While conclusions should be tempered by the small sample size and non-randomized design, the results were positive with medium to large effect sizes. These results are not unexpected, given the lack of mental health preparation in the professional training curricula of LHPs.[2, 25, 41, 42, 44] That this Internet training was well received by LHPs is in itself interesting, because the program was designed for less-educated certified staff. Overall, the results suggest that even though designed for certified staff, behavior skills training has potential benefit for, and was valued by LHPs too.

Taken together, this study supports previous research indicating the potential efficacy of Internet training for NAs.[46, 49, 60, 61] Individualized computerized training is attractive because it is replicable and time efficient, compared to a traditional in-service training model.[45, 46] Our experience from in-person studies and usability testing has been that the lack of computer experience is not an obstacle for NAs, if the program is designed with the inexperienced users in mind (i.e., no keyboarding required; low reading level). A brief training on use of the computer mouse may be needed initially for inexperienced users. Training with a computer, however, need not be exclusively a single-user experience, because in-service

sessions with a computer projector may be a valuable training adjunct for review of specific topics and to facilitate group sharing and discussion. For LHP users, the program potentially could be supplemented with additional content about geriatrics and psychiatric disorders, which could facilitate their staff training capabilities and might qualify for continuing education credit.

While the research presented here is promising, it has limitations. First, follow-up assessments are needed to examine maintenance of training effects. Although self-reports via telephone interviews suggested that the intervention had post-training behavioral effects on some of the program users, longer term follow-up, preferably with *in vivo* data, would provide more solid evidence of training effects. Second, while study participants were randomized, they participated on the Internet without direct contact with the research team. Consequently, we cannot verify that they met the screening criteria. Third, because this was an Internet study, we speculate that the participants may have included more sophisticated computer users than is representative of the NA population as a whole. Finally, because of the small sample size and use of the within-subjects design, the LHP study results should be viewed with some caution until further research has been conducted.

Conclusions

The results reported here show the potential value of training LTC staff about mental illness, and they support previous research, demonstrating the efficacy of Internet training for direct care givers. A program designed for NAs also can be effective and acceptable to licensed staff. Broad implementation of Internet training for LTC staff may yield enhanced employee's confidence and skills, as well as improved resident care.

REFERENCES

1.   Department of Health and Human Services. Nursing Home Data Compendium. 2009; http://www.cms.gov/CertificationandComplianc/Downloads/nursinghomedatacompendium_508.pdf.

2.   Molinari VA, Merritt SS, Mills WL, et al. Serious mental illness in Florida nursing homes: need for training. *Gerontol Geriatr Educ.* 2008;29(1):66-83.

3.   Jones AL, Dwyer LL, Bercovitz AR, Strahan GW. The National Nursing Home Survey: 2004 overview. *Vital Health Stat 13.* Jun 2009(167):1-155.

4.   Tariot P, Podgorski C, Blazina L, Leibovici A. Mental disorders in the nursing home: another perspective. *American Journal of Psychiatry.* 1993;150(7):1063.

5.   Smyer MA, Shea DG, Streit A. The provision and use of mental health services in nursing homes: results from the National Medical Expenditure Survey. *Am J Public Health.* Feb 1994;84(2):284-287.

6.   Davison TE, McCabe MP, Mellor D, Ski C, George K, Moore KA. The prevalence and recognition of major depression among low-level aged care residents with and without cognitive impairment. *Aging Ment Health.* Jan 2007;11(1):82-88.

7.   Smalbrugge M, Jongenelis L, Pot AM, Beekman AT, Eefsting JA. Comorbidity of depression and anxiety in nursing home patients. *Int J Geriatr Psychiatry.* Mar 2005;20(3):218-226.

8.   Tabloski P. Psychological and cognitive function. *Gerontological Nursing*. Upper Saddle River, NJ: Pearson Prentice Hall; 2006:188-241.

9.   Morris JN, Fries BE, Mehr DR, et al. MDS Cognitive Performance Scale. *J Gerontol.* Jul 1994;49(4):M174-182.

10. Gates DM. *Violence Against Nurses: The Silent Epidemic*. Columbus, OH: Ohio's Nurses Association Continuing Education; 2002.

11. Gates DM, Fitzwater E, Deets C. Testing the reliability and validity of the assault log and violence prevention checklist. *Journal of Gerontological Nursing.* 2003;29:18-23.

12. Gates DM, Fitzwater E, Meyer U. Violence against caregivers in nursing homes. Expected, tolerated, and accepted. *J Gerontol Nurs.* Apr 1999;25(4):12-22.

13. Bourgeois M, Hickey E. *Dementia: From diagnosis to management - A functional approach*. New York: Taylor & Francis; 2009.

14. Yeom H-A, Watson NM. 2 Patterns of antecedents of catastrophic reactions in nursing home residents with dementia in the United States. *Asian Nursing Research.* 2009;3(3):99-110.

15. Snyder LA, Chen PY, Vacha-Haase T. The underreporting gap in aggressive incidents from geriatric patients against certified nursing assistants. *Violence Vict.* 2007;22(3):367-379.

16. Squillace MR, Remsburg RE, Harris-Kojetin LD, Bercovitz A, Rosenoff E, Han B. The National Nursing Assistant Survey: improving the evidence base for policy initiatives to strengthen the certified nursing assistant workforce. *Gerontologist.* Apr 2009;49(2):185-197.

17. Fick DM, Agostini JV, Inouye SK. Delirium superimposed on dementia: a systematic review. *J Am Geriatr Soc.* Oct 2002;50(10):1723-1732.

18. Plassman BL, Langa KM, Fisher GG, et al. Prevalence of dementia in the United States: the aging, demographics, and memory study. *Neuroepidemiology.* 2007;29(1-2):125-132.

19. Lyketsos CG, Olin J. Depression in Alzheimer's disease: overview and treatment. *Biol Psychiatry.* Aug 1 2002;52(3):243-252.

20. Leonard R, Tinetti ME, Allore HG, Drickamer MA. Potentially modifiable resident characteristics that are associated with physical or verbal aggression among nursing home residents with dementia. *Arch Intern Med.* Jun 26 2006;166(12):1295-1300.

21. U.S. Department of Health and Human Services. Mental Health: A Report of the Surgeon General - Executive Summary. In: Department of Health and Human Services, ed. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Mental Health Services; 1999.

22. Sedensky M. More young people are winding up in nursing homes. *NewsyStocks.com.* 2011. http://newsystocks.com/news/3890225. Accessed January 6, 2011.

23. U.S. Department of Health and Human Services. *Nurse Aide Training*. Washington, DC: Office of the Inspector General; 2002.

24. Hanlon JT, Schmader KE, Ruby CM, Weinberger M. Suboptimal prescribing in older inpatients and outpatients. *J Am Geriatr Soc.* Feb 2001;49(2):200-209.

25. Glaister JA, Blair C. Improved education and training for nursing assistants: keys to promoting the mental health of nursing home residents. *Issues Ment Health Nurs.* Aug 2008;29(8):863-872.

26. Smith M, Specht J, Buckwalter KC. Geropsychiatric inpatient care: what is state of the art? *Issues Ment Health Nurs.* Jan 2005;26(1):11-22.

27. Bourgeois M, Dijkstra K, Burgio L, Allen R. Communication skills training for nursing aides of residents with dementia: The impact of measuring performance. *Clinical Gerontologist.* 2004;27(1/2):119-138.

28. Zimmerman S, Gruber-Baldini AL, Hebel JR, Sloane PD, Magaziner J. Nursing home facility risk factors for infection and hospitalization: importance of registered nurse turnover, administration, and social factors. *J Am Geriatr Soc.* Dec 2002;50(12):1987-1995.

29. Porter R, Flanders J, Parsons S. A reevaluation of cognitive care training in nursing homes. *Educational Gerontology.* 2004;30:537-553.

30. Beck C, Diabm R, Cody M. Nursing assistants as providers of mental health care in nursing homes. *Generations.* 2002;26:66-71.

31. American Geriatrics Society & American Association for Geriatric Psychiatry. The American Geriatrics Society and American Association for Geriatric Psychiatry recommendations for policies in support of quality mental health care in U.S. nursing homes. *Journal of the American Geriatrics Society.* 2004;51:1299-1304.

32. National Institute of Mental Health. *Emerging practices in nursing homes*. Washington, DC: U.S. Government Printing Office; 2005.

33. National Alliance of Mental Illness. Fight Stigma: Become a StigmaBuster! 2010; http://www.nami.org/template.cfm?section=fight_stigma. Accessed April 29, 2010.

34. National Institute of Mental Health. The Numbers Count: Mental Disorders in America. 2010; http://www.nimh.nih.gov/health/publications/the-numbers-count-mental-disorders-in-america/index.shtml. Accessed December 23, 2010.

35. Park M. Nursing staff stress from caregiving and attitudes toward family members of nursing home residents with dementia in Korea *Asian Nursing Research.* 2010;4(3):130-141.

36. Brooker D. What is person-centred care for people with dementia. *Reviews in Clinical Gerontology.* 2004;13(3):215-222.

37. Brooker D. *Person-Centred Dementia Care: Making Services Better*: Jessica Kingsley Publishers; 2007.

38. Voyer P, Martin LS. Improving geriatric mental health nursing care: making a case for going beyond psychotropic medications. *Int J Ment Health Nurs.* Mar 2003;12(1):11-21.

39. Corrigan PW. Use of a token economy with seriously mentally ill patients: criticisms and misconceptions. *Psychiatr Serv.* Dec 1995;46(12):1258-1263.

40.   Donat DC, McKeegan GF. Employing behavioral methods to improve the context of care in a public psychiatric hospital: some applications to health care management. *Psychiatr Rehabil J.* Fall 2003;27(2):177-181.

41.   Cather C, Penn D, Otto MW, Yovel I, Mueser KT, Goff DC. A pilot study of functional Cognitive Behavioral Therapy (fCBT) for schizophrenia. *Schizophr Res.* May 1 2005;74(2-3):201-209.

42.   Morris DL, Mentes J. Geropsychiatric nursing education: Challenge and opportunity *J Am Psychiatr Nurses Assoc.* 2006;12(2):105-115.

43.   Perese E. Stigma, poverty, and victimization: roadblocks to recovery for individuals with severe mental illness. *J Am Psychiatr Nurses Assoc.* 2007;13(5):285-295.

44.   Institute of Medicine. Retooling for an Aging America: Building the Health Care Workforce. 2008; http://www.nap.edu/catalog/12089.html. Accessed April 28, 2010.

45.   Irvine A, Ary D, Bourgeois M. An interactive multimedia program to train professional caregivers. *Journal of Applied Gerontology.* 2003;22(2):269-288.

46.   Irvine AB, Bourgeois M, Billow M, Seeley JR. Internet training for nurse aides to prevent resident aggression. *Journal of the American Medical Director's Association.* Oct 2007;8(8):519-526.

47.   Rosen J, Mulsant BH, Kollar M, Kastango KB, Mazumdar S, Fox D. Mental health training for nursing home staff using computer-based interactive video: a 6-month randomized trial. *Journal of the American Medical Directors Association.* 2002;3(5):291-296.

48.   Breen A, Swartz L, Flisher AJ, et al. Experience of mental disorder in the context of basic service reforms: the impact on caregiving environments in South Africa. *Int J Environ Health Res.* Oct 2007;17(5):327-334.

49.   Hobday JV, Savik K, Smith S, Gaugler JE. Feasibility of Internet training for care staff of residents with dementia: the CARES program. *J Gerontol Nurs.* Apr 2010;36(4):13-21.

50.   Flay BR, Sobel J. The role of mass media in preventing adolescent substance abuse. In: Glynn T, Leukefeld C, Ludford J, eds. *Preventing Adolescent Drug Abuse: Intervention Strategies*. Washington, DC: National Institute on Drug Abuse; 1983.

51.   Adams N, Grieder D. *Treatment Planning for Person-Centered Care: The Road to Mental Health and Addiction Recovery (Practical Resources for the Mental Health Professional*. London: Elseiver Academic Press; 2005.

52.   Pioneer Network. Pioneer Network. 2010; http://www.pioneernetwork.net. Accessed May 25, 2010.

53.   Bandura A. *Principles of Behavior Modification*. New York: Holt, Rinehart and Winston; 1969.

54.   Bandura A. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall; 1977.

55.   Malotte CK, Jarvis B, Fishbein M, et al. Stage of change versus an integrated psychosocial theory as a basis for developing effective behaviour change interventions. The Project RESPECT Study Group. *AIDS Care.* Jun 2000;12(3):357-364.

56.   Chambers M, Connor S, Diver M, McGonigle M. Usability of multimedia technology to help caregivers prepare for a crisis. *Telemedicine Journal and e-Health.* 2002;8(3):343-347.

57.   Vandelanotte C, De Bourdeaudhuij I, Sallis J, Spittaels H, Brug J. Efficacy of Sequential or Simultaneous Interactive Computer-Tailored Interventions for Increasing Physical Activity and Decreasing Fat Intake. *Annals of Behavioral Medicine.* 2005;29(2):138-146.

58.   Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Erlbaum & Associates; 1988.

59. Rosnow R, Rosenthal R. Assessing the effect size of outcome research. In: Nezu A, Nezu C, eds. *Evidence-Based Outcome Research: A Practical Guide to Conducting Randomized Controlled Trials for Psychosocial Interventions*. New York: Oxford University Press; 2008:379-401.

60. Ali NS, Hodson-Carlton K, Ryan M, Nagia A. Web-based professional education for advanced practice nursing: a consumer guide for program selection. *J Contin Educ Nurs.* Jan-Feb 2002;33(1):33-38.

61. MacDonald C, Stodel E, Casimiro L. Online dementia care training for healthcare teams in continuing and long-term care homes: A viable solution for improving quality of care and quality of life for residents. *International Journal on E-Learning.* 2006;5(3):27.