ABSTRACT

Background

The Fountain of Health (FoH) initiative offers valuable evidence-based mental health knowledge and provides clinicians with evaluated tools for translating knowledge into practice, in order to reduce seniors’ risks of mental disorders, including dementia.

Methods

A presentation on mental health promotion and educational materials were disseminated to mental health clinicians including physicians and other allied health professionals either in-person or via tele-education through a provincial seniors’ mental health network. Measures included: 1) a tele-education quality evaluation form, 2) a knowledge transfer questionnaire, 3) a knowledge translation-to-practice evaluation tool, and 4) a quality assurance questionnaire.

Results

A total of 74 mental health clinicians received the FoH education session. There was a highly significant \( (p < .0001) \) difference in clinicians’ knowledge transfer questionnaire scores pre- and post-educational session. At a two-month follow-up, 19 (25.7%) participants completed a quality assurance questionnaire, with all 19 (100%) of respondents stating they would positively recommend the FoH information to colleagues and patients. Eleven (20.4%) translation-to-practice forms were also collected at this interval, tracking clinician use of the educational materials.

Conclusions

The use of a formalized network for knowledge transfer allows for education and evaluation of health-care practitioners in both acquisition of practical knowledge and subsequent clinical behavior change.

Key words: seniors, mental health promotion, knowledge transfer, translation psychiatry

INTRODUCTION

Canada’s senior population is rapidly growing, and by 2036, one in four Canadians will be over 65 years of age. (1) Nova Scotia is currently ranked the “oldest” province in the country. (2) There is growing public health interest in understanding and promoting successful aging, and a national call for clinicians to offer mental health promotion to seniors, including strategies to recognize and reduce risk of dementia and other mental disorders. In this context, the Mental Health Commission of Canada Guidelines for Older Adults (1) and the Alzheimer Society Rising Tide document (3) have recently emphasized the need for more mental health promotion for seniors, yet there are few accessible sources of reliable information available to clinicians, or direction on how front line health-care workers might integrate health promotion into their practices. There is also a lack of research regarding knowledge transfer (KT) in seniors’ mental health in general, and a clear paucity with respect to translation-to-practice for seniors’ mental health clinicians.

Recent studies provide evidence of the benefits of mental health promotion and building resiliency in older age. Levy et al. (4) found that a 7.5-year increase in longevity was associated with positive self-perceptions of aging, in comparison to those holding negative attitudes towards aging. Jeste et al. (5) showed that older age was associated with higher self-rated successful aging, suggesting that increasing resilience may be linked to the promotion of successful aging—a finding that Jeste and Palmer (6) argue provides a rationale for a call for a “positive psychiatry of aging” movement to eliminate mental illness and actively promote late life resiliency. In longevity research, Poon et al. (7) showed that centenarians share the positive mental health attributes of optimism, adaptability, and positive attitudes towards aging. While evidence grows that lifestyle and attitude impact longevity, clinicians have minimal direction on how to translate this understanding into clinical practice.
The following project offers direction to mental health clinicians by providing reliable positive-aging information and patient education tools. The Fountain of Health (FoH) (8) is a novel initiative within Canada, aiming to promote seniors’ mental and cognitive health. It is a collaboration of physicians, allied health-care providers, government, and non-profit organizations serving seniors in Nova Scotia in order to: (1) improve seniors’ health and quality of life through evidence-based mental health education, (2) empower seniors and care providers with accurate knowledge to change negative views about aging and instill hope about positive aging, (3) strengthen community experts and leaders through knowledge transfer, and (4) create successful programs and support a healthier provincial senior population within the next 10 years.

The FoH developed over several years: year 1 (2012) addressed preventative strategies and health promotion related to older adults through collaboration of 13 organizations involved in providing care to seniors. Year 2 (2013) developed five evidence-based positive-aging messages. Year 3 (2014) developed clinical tools and materials and disseminated information to front line mental health clinicians.

Knowledge transfer (KT) is defined as “the process of moving knowledge into practice” and requires three components: (1) relevant research or practice-based evidence, (2) a supportive learning environment, and (3) targeted mechanisms meeting the needs of the community of practice. (9) In a 2009 review of the application of KT within medicine, only 20 out of 492 clinicians identified KT resources of which 4% were pertinent to the mental health of seniors.

The investigation of KT in seniors’ mental health care is scarce. Some evidence suggests the increased efficiency of KT within a well-structured “network,” in contrast to informal organizations. (10) Other identified factors include the identification of “change agents” or learning facilitators, (11) and provision of the appropriate context and learning environment. (12,13) Bosma et al. (14) previously demonstrated that the Nova Scotia Seniors’ Mental Health Network (NSSMHN), a provincial network unique to Nova Scotia, was effective in the provincial dissemination of national guidelines published by the Canadian Coalition of Seniors’ Mental Health.

Building on these findings by Bosma and colleagues, the present study examines the capacity of the NSSMHN to disseminate FoH seniors’ mental health promotion information across urban and rural settings. Similar to Bosma et al., open-ended feedback regarding the quality of the FoH education and intent to apply to practice was included, and clinician behavior change was measured following the educational intervention.

The primary hypothesis is that knowledge of the FoH and intention to apply the information would increase among NSSMHN members following an educational session. The secondary hypothesis is that members of the NSSMHN would use the new knowledge and materials in clinical practice.

**METHODS**

**Design**

This pilot project was an observational study utilizing existing KT mechanisms of a provincial network for dissemination of mental health promotional information to mental health clinicians in secondary and tertiary care teams. The following KT mechanisms were utilized via the study protocol (Figure 1).

**KT Mechanism 1: Engage Local Change Agents via NSSMHN**

In attending meetings of the NSSMHN, the authors established relationships with clinical-change champions with each of nine District Health Authorities (DHAs). These clinician disseminators of FoH materials received the following tools:

![Diagram](image)

**FIGURE 1.** Study Protocol with two stages. The first stage was the initial KT and the second stage occurred two-months later for follow-up of translation to practice.
1) 10–20 copies of an interactive FoH handbook (Figure 2) for each of the 9 DHAs, 2) access to a FoH website (www.fountainofhealth.ca), 3) a 2-minute educational video for patients accessed via the website, and 4) a condensed single-page information sheet regarding the FoH content. These clinical-change champions were also asked to record their and their colleagues’ use of the FoH materials with a knowledge translation-to-practice evaluation tool in the subsequent two months following an educational session.

KT Mechanism 2: Seniors’ Mental Health Team In-Person Education Session

An in-person educational session regarding the FoH information was provided to 14 clinicians on the CDHA seniors’ mental health (SMH) team. A live role-play demonstrated the application of the FoH material within a clinical scenario. The SMH team members completed a 16-point knowledge translation questionnaire pre- and post-educational intervention. Each clinician also received 5–10 copies of the FoH handbook, was challenged to apply this and other FoH tools to their practice in the subsequent two months, and was provided a tracking form to record use of the materials.

KT Mechanism 3: NSSMHN Tele-Education Session

The same educational session including the live role-play was presented to 60 clinicians via the NSSMHN Tele-Education program reaching 18 sites in nine DHAs across Nova Scotia. Change champions in each of the nine DHAs facilitated the sessions locally, including promoting the sessions to local mental health teams and distributing the evaluation forms and FoH handbooks mailed to them in advance. These participants also completed a tele-education quality evaluation form.

Outcome Measures

The primary outcome measure of the KT process was a pre- and post-intervention knowledge transfer questionnaire (Table 1), capturing knowledge of and attitudes towards the FoH information prior to, and following, the educational session. The pre- and post-questionnaire included questions regarding clinician’s knowledge of the FoH information and attitudes about using the materials. These attitudes were measured again two months later specifically regarding awareness of the FoH initiative, utilization of the FoH information, awareness of assessment of lifestyle factors outlined in the FoH, and counseling of patients in health promotion using the FoH (Table 2).

Secondary outcome measures were: 1) a standard quality evaluation tool of the tele-education session following the education session, 2) a self-report questionnaire regarding each clinician’s perceptions and use of the materials two months later, and 3) a knowledge translation-to-practice tracking tool to record clinicians’ use of the FoH multimedia materials during the two months following the educational session.

FIGURE 2. Sample page of the FOH Handbook demonstrating the key message and associated suggestions for increasing physical activity.
### TABLE 1.
Pre- and post-intervention questionnaire

**Fountain of Health: Pre-/Post-Intervention Questions**

| Question                                                                 | Options                                      | Pre-intervention | Post-intervention |
|--------------------------------------------------------------------------|----------------------------------------------|------------------|-------------------|
| 1. I am aware of the Fountain of Health (FoH) Initiative to promote mental/cognitive health in seniors. | • True • False                              |                  |                   |
| 2. Currently, I directly utilize the information from the Fountain of Health (FoH) Initiative in working with my patients. | • True • False                              |                  |                   |
| 3. List the five evidence-based mental health promotion interventions outlined by the Fountain of Health: | • True • False                              |                  |                   |
| 4. Which of the above five interventions has the strongest evidence-base for “cognitive” protecting benefits? (circle a letter) | • True • False                              |                  |                   |
| 5. Currently I am aware of how to **assess** patients needing FoH lifestyle changes to promote their mental and cognitive health. | • True • False                              |                  |                   |
| 6. Currently I am aware of how to **advise/counsel** patients in FoH evidence-based life-style interventions to promote their mental and cognitive health. | • True • False                              |                  |                   |
| 7. The percentage of human longevity found to be determined by our genetics/family genes is: | a) 25% b) 45% c) 65% d) 85%               |                  |                   |
| 8. Regarding mood disorders, depression has generally been found to be less treatable in seniors than it is younger adults. | • True • False                              |                  |                   |
| 9. Social activity has been shown to: | a) Improve brain performance b) Decrease depression c) Increase longevity d) All of the above e) None of the above - There is a lack of evidence for social activity |                  |                   |
| 10. How much additional duration of life is associated with a positive self-perception of ageing? | a) 6 months b) 2.5 years c) 5.5 years d) 7.5 years e) None of the above |                  |                   |
| 11. In terms of exercise, the recommended amount of physical activity in seniors to promote mental and cognitive health is: | a) 60 minutes/week b) 120 minutes/week c) 150 minutes/week d) 180 minutes/week e) None of the above |                  |                   |
| 12. In terms of cognitive activity, if your patient already speaks French and regularly plays bridge, which of the following tasks would be of greatest cognitive benefit according to the evidence? | a) Learning to speak Spanish b) Learning to speak Russian c) Playing bridge at a more advanced level d) All of the above - Activities are equal in benefit e) None of the above |                  |                   |

### Statistical Measures

The results of the pre- and post-intervention knowledge transfer questionnaires were analyzed via an unpaired $t$-test protocol, calculating mean scores ± SD. Additionally, the information from the knowledge translation-to-practice tools was subgrouped into rural and urban communities. At the two-month interval, data were analyzed using mean scores ± SD, along with subgrouping into Likert score categories. Responses to the open-ended questions of the questionnaire were categorized and examined for common themes, along with the informal oral feedback obtained in further interactions with the NSSMHN.

Return rates of assessment tools were calculated as a percentage.
RESULTS

Participants

In total, 74 clinicians attended the FoH intervention through the seniors’ mental health team in-person seminar or the NSSMHN tele-health educational sessions (14 attended the in-person seminar and 60 attended the NSSMHN tele-health session). Participants were from a variety of multidisciplinary services including psychiatrists or psychiatry residents, nurses, social workers, psychologists, and family physicians.

Pre- and Post-Intervention Knowledge Transfer Questionnaire

With a return rate of 100% (N=14) from the in-person education session and 44% (N=23) from the tele-education sessions, a total of 37 (50.0%) of pre- and post-intervention knowledge transfer questionnaires were completed. Unpaired t-test calculations were performed with IBM SPSS Statistics 21 which found the difference (Figure 3) between the pre- and post-intervention questionnaire means (7.08±3.65 and 14.24±0.93, respectively) to be significantly different (p < .0001). Effect size calculations were also performed, with a Cohen’s d of 2.69 and an effect size correlation of 0.80.

Tele-Education Quality Evaluation Forms

Fifty-two (86.7%) of the participants in the NSSMHN tele-education seminar completed quality evaluation forms following the intervention (Table 3). Ratings of various aspects of the educational seminar were taken, ranging from 1 (poor) to 5 (excellent). The average participant score for the rating was 4.36±0.55. Forty-three (71.2%) participants responded “Yes” when asked if the session would have an impact on their clinical practice, with 9 (17.3%) respondents marking that this question was “not applicable,” and 6 (11.5%) respondents choosing not to answer the question.

TABLE 2. Knowledge and attitudes towards FoH: pre- and post-intervention questionnaire mean scores*

| Questions Assessing Knowledge and Attitudes Regarding Health Promotion | Pre-Intervention | Post-Intervention |
|-------------------------------------------------|-----------------|-----------------|
| 1. I am aware of the Fountain of Health (FoH) Initiative to promote mental/cognitive health in seniors. | 0.57±0.50 | 1.00±0.00† |
| 2. Currently, I directly utilize the information from the Fountain of Health (FoH) Initiative in working with my patients. | 0.19±0.40 | 0.95±0.23† |
| 5. Currently, I am aware of how to assess patients needing FoH lifestyle changes to promote their mental and cognitive health. | 0.30±0.46 | 0.97±0.16† |
| 6. Currently, I am aware of how to advise/counsel patients needing FoH lifestyle changes to promote their mental and cognitive health. | 0.24±0.43 | 1.00±0.00† |

*Binary scale (0=false, 1=true). †p < .05.

FIGURE 3. Pre-intervention (7.08±3.65) and Post-intervention (14.24±0.93) questionnaire scores. Two-tailed p-value < 0.0001. Cohen’s d 2.69, effect size correlation 0.80.

Quality Assurance Questionnaire: Quantitative

Of the 74 total participants, 19 (25.7%) completed the quality assurance questionnaires distributed at the two-month interval; however, as the group targeted for this outcome measure included only those in the in-person session and our identified change champions, the completion rate increases to 19 in 23 (82.6%). Of these respondents, 15 (78.9%) reported the handbook to be the most useful tool, with the remaining 4 (21.1%) opting to leave the question unanswered. All 19 (100%) of the respondents stated that they would recommend the information to colleagues and patients if clinically applicable. Likewise, all respondents stated that the FoH information was either “somewhat relevant” or “very relevant” to their patients and also found that patients were either “somewhat receptive” or “very receptive” to the FoH materials.
Quality Assurance Questionnaire: Open-Ended Feedback

Open-ended feedback was also obtained at the two-month post-intervention interval, both via informal oral feedback and through open-ended survey questions on the questionnaire, with generally positive feedback being obtained from respondents. One participant stated, “I feel this is an awesome initiative and will definitely be looking for opportunities to continue to spread the word.” Other participants suggested that the FoH was “overall, very useful material” and a “great initiative,” with “patients [being] responsive.”

Suggestions for improvement of the initiative included “information in a [presentation] capacity would be helpful” and that “the material should be disseminated for use by general practitioners, geriatricians, nurse practitioners, in-patient teams, caregivers, and Continuing Care.”

Regarding the educational intervention, one respondent said, “I didn’t know how to use the FoH materials until I saw the role-play.” Another participant suggested, “after a long assessment, there is little time to go through the video and elicit commitment from the patient.”

Knowledge Translation-to-Practice Tool

In the same targeted group at the two-month interval, 11 (57.9%) completed translation-to-practice tools were collected, which demonstrated that the FoH initiative was discussed with 102 members of the target population for an average of 9.27 patients per clinician. The handbook was reviewed with 96 (94.1%) of these patients for an average of 8.73 patients per clinician. The media-based components of the website and the video were viewed by 41 (40.1%) and 33 (32.4%) of patients, respectively (for 3.73 and 3.00 patients per clinician).

Sixty (58.8%) patients set a specific goal and 50 (49.0%) patients signed the FoH “agreement,” or pledge, to indicate their commitment to taking action by following through on at least one of the goals they set for the subsequent month (for 5.45 and 4.55 patients per clinician, respectively). The FoH was communicated to primary care providers in 73 (71.6%) of cases, or 6.64 family physicians per clinician.

Subgroup analysis was also performed between urban and rural providers (Figure 4). Of those clinicians using the media-based components, the website was viewed by 21 (20.6%) and 20 (19.6%) urban and rural clients, respectively. The video was used in 19 (18.7%) cases in urban regions, in comparison to 14 (13.7%) in rural locations. By comparison, the handbook was utilized more in the rural setting, with 53 (52.0%) patients discussing the handbook, versus 43 (42.2%) in the urban location. Likewise, rural clients appeared to follow through more frequently on the action-oriented items of goal setting (n=35, 34.3%) and signing the pledge (n=28, 27.5%), in comparison to the urban clients, of whom 25 (24.5%) set goals and 22 (21.6%) signed the pledge.

DISCUSSION

As the Canadian population ages, the role of health promotion for seniors continues to grow in importance. Effective and evidence-based seniors’ mental health promotion initiatives are increasingly relevant embedded within a “positive psychiatry of aging” movement.

The FoH aims to provide evidence-based information on mental and cognitive health promotion for seniors and clinicians. To our knowledge, this is the first study of seniors’ mental health promotion to evaluate clinician KT and translation into practice. Existing KT mechanisms of the NSSMHN previously demonstrated by Bosma et al. (14) were leveraged,
feedback on the quality assurance questionnaire indicates both clinician uptake and a favorable response by patients as indicated by clinicians’ perceived relevancy of the health promotional information to the target population. Clinicians who completed the translation-to-practice tool shared the FoH information with an average of 8.73 patients each.

Several multimedia tools were provided to clinicians, and, in urban areas, there was greater use of the FoH video; conversely, in rural areas, there was greater use of the interactive handbook.

The in-person and network-based educational models were previously established as positive KT environments. The identification of local change champions was instrumental in generating support for the initiative and in developing capacity for study participation.

There were a number of limitations to this study. The self-reported nature of the outcome measures and the lack of anonymity due to tracking of Continuing Medical Education credits, invokes a potential reporting bias. Response to the two-month follow-up survey was low, which may result from clinician workload, perceived applicability of FoH information, and resource availability. The NSSMHN tele-health broadcast reached 18 sites across nine DHAS, but only 9 sites were assessed due to change champions physically present in these locales. While patients were determined to be responsive to the FoH material, information was not obtained regarding patient selection, with possible associated selection bias. Finally, patient response was not measured.

Despite the limitations, this is the first study, to our knowledge, which directly examines KT and translation into clinical practice with respect to clinician behavior change. We found that an educational intervention utilizing both in-person and a formal network model was effective in KT of a new health promotional initiative targeting seniors. We also found the session helped to catalyze behavior change in clinicians with limited time to educate seniors.

With a growing senior population and a call for a “positive psychiatry of aging” movement to reduce mental illness and promote resiliency in late life, initiatives such as Nova Scotia’s FoH initiative are of increasing relevance. The results of this project give early positive signals for Nova Scotia’s FoH initiative, its materials, and its provincial network. These findings suggest that the FoH initiative might be relevant for application to a national audience, in alignment with the seniors’ mental health promotion guidelines of the Mental Health Commission of Canada, for example, through national networks such as the Canadian Dementia Knowledge Translation Network. A national FoH collaboration has already begun through the Canadian Coalition for Seniors’ Mental Health.

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CONFLICT OF INTEREST DISCLOSURES

The authors declare that no conflicts of interest exist.

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