A Program of Nursing Research in a Rural Setting

Clarann Weinert, SC, PhD, RN, FAAN [1]

Elizabeth Nichols, PhD, RN, FAAN [2]

Jean Shreffler-Grant, PhD, RN [3]

[1] Professor Emerita, College of Nursing, Montana State University, cweinert@montana.edu

[2] Professor Emerita, College of Nursing, Montana State University, elizabeth59715@gmail.com

[3] Professor, College of Nursing, Montana State University, jeansh@montana.edu

Abstract

Recounted in this article is the saga of a team's rural research journey over nearly 20 years. From the outset the overall goal of our research was the promotion of informed health care choices by older rural dwellers. The purpose of sharing our journey story is to illustrate how a program of nursing research can thrive despite being conducted in a low nursing research resource environment, across geographic distances, and with a limited patchwork of funding. This journey began with several collaborative studies on the use of complementary and alternative therapies (CAM) by older rural dwellers. A detour in the research journey trajectory occurred with the advent of national recognition of the key role of general health literacy and more specifically the lack of research in the area of health literacy regarding CAM. The research team's journey moved to the conceptualization and development of a model of CAM health literacy. This model then served as the basis for creating and the initial testing a measure of CAM health literacy. The intention of this article is to be instructive to other research teams as they travel along their own research journeys.

Keywords: nursing research, rural, CAM health literacy

A Program of Nursing Research in a Rural Setting

Sustaining a program of nursing research in a rural setting is a journey with many opportunities and challenges. The purpose of recounting the story of our journey is to share how a program of nursing research can thrive despite being conducted in low nursing research resource environments, across geographic distances, and with a limited patchwork of funding. We attribute our success to an active and astute research team, a topic of interest to all team members, the ability to work across long distances, and a large dose of persistence. In telling this story, only the highlights of our studies are presented. The full descriptions of these studies have been published previously

The Research Team

The early phase of this journey was launched by a senior administrator at the University of North Dakota (UND) and a senior investigator from Montana State University (MSU), institutions separated by 800 miles. A master's student and junior faculty member at UND rounded out the original team. Shortly into the research adventure, these two junior individuals moved on – the master's student into a doctoral program in another state, the faculty member to clinical practice. To replace the lost team members and enrich this two-institutional research team, the two senior investigators then sought additional members from each institution who were junior in their research roles but interested and competent. A junior investigator from MSU with an interest in complementary and alternative therapies (CAM) and previous rural research joined and was quickly mentored into the role of principal investigator. In addition, a senior faculty member from UND joined the team. These four researchers began a research collaboration that has continued for almost twenty years.

Depending on the needs of the research program, other investigators have joined the team for specific tasks. For example, two senior MSU investigators were hired: one to conduct interviews in an early study, and one to collect data in a more recent study. Graduate and undergraduate students enriched the research team and engaged in library searches, assisted with data collection and management, and helped with the preparation of manuscripts and presentations.

A significant challenge to the team was working over long distances-- not only across states but also within the state of Montana. For example, the principal investigator's location is 200 miles from the main campus of Montana State University (MSU) and the second MSU investigator. The key to successfully meeting this challenge has been ongoing and frequent communication among the members of the team, utilizing a variety of strategies. The increased ease of electronic and telephone communication facilitated productive meetings. Highly important were annual face-to-face meetings that promoted team cohesion, allowed for concentrated group work time, and resulted in the production of grant applications, publications, and presentations.

Over the course of the journey, the core research team has adapted to a variety of changes: new academic roles/status, the relocation of one of the North Dakota team members to Montana, and the death of the other North Dakota colleague. The remaining three core members continue to work successfully as an engaged research team.

Identifying the Focus of Research

Central to our program of research has been an emphasis on examining strategies for enhancing the health of older rural adults. Our early studies on the use of CAM by older rural dwellers were driven by the interests of the initial junior team members and that meshed well

with the broader research endeavors of the senior investigators. Further, the cutting edge studies by Eisenberg, et al (1993; 1998) on CAM use did not differentiate between urban and rural populations, our area of interest.

During the late 1990s and early 2000s, several well-known national studies were conducted which demonstrated that the use of CAM among the general U.S. population was more common than previously thought. Further, researchers found that often there was limited communication between consumers and providers about treatment options and the consumer's use of CAM (Astin, 1998; Eisenberg, et al., 1993). Researchers noted that CAM therapies were used more often for chronic than acute health problems. Use was more common among women, younger adults, those with higher incomes, more education, and those living in the western United States (Astin, Pelletier, Marie, & Haskell, 2000; Cherniak, Senzel, & Pan, 2001; Eisenberg, et al. 1998). These investigators tended not to differentiate between rural and urban populations. However, when studies were designed to focus on the use of CAM among rural dwellers, the results were inconsistent. Vallerand, Foulabakhsh, and Templin, (2003) found that CAM use was less prevalent among rural dwellers than among urban. Yet, Harron and Glasser (2003) reported that the use of CAM was more common among rural residents. Conversely, other researchers found that the prevalence of use among rural and urban dwellers was similar (Arcury, Preisser, Gesler, & Sherman, 2004).

Initial Studies on the Research Journey

The initial research on our journey included a series of studies with older adults living in rural areas to further understand the role of CAM in health decisions. The primary purpose was to explore the use of, and satisfaction with, CAM from the perspectives of older rural people. The team also sought to gain a better understanding of why CAM was used and what sources

were used to obtain information about CAM therapies. Throughout these early studies, participants were recruited from counties in Montana and North Dakota that met the federal definitions for rural and frontier. All studies discussed in this journey were approved by the universities' institutional review boards for protection of human subjects.

In the first study, 325 randomly selected older adults in 19 rural communities were interviewed by telephone. Participants had a mean age of 72 years and most (67.7%) reported having one or more chronic illnesses. Only 17.5% reported using complementary providers, while 35.7% used self-prescribed CAM practices, such as home remedies, nutritional supplements, and herbal products. Participants most often learned about the therapies from relatives and friends or consumer marketing rather than from health care professionals. Those most likely to use CAM were women who were fairly well educated, not currently married, and in their early older years. They had one or more significant chronic illnesses and lower health related quality of life (Shreffler-Grant, Hill, Weinert, Nichols, & Ide, 2007; Shreffler-Grant, Weinert, Nichols, & Ide, 2005). From this survey, the research team gained an overview of who used CAM and what type they used, but it did not provide information about why they used CAM, or how much they knew about what they used.

To obtain more in-depth information, ten older rural adults with a chronic illness who had reported using CAM in the initial interview were re-interviewed. Six of the 10 participants were women; eight were between the ages of 70-80; and two were between 60-70 years. Their mean education level was 12.5 years. They primarily used self-prescribed CAM therapies to compensate for perceived dietary deficiencies. For the most part, they were satisfied with the results they attributed to the CAM. It was clear, however, that some participants used the therapies in an inconsistent manner and did not understand the purpose of the products.

Participants attempted to use reputable sources for information; yet, few sought information from their allopathic providers due to a perception that the providers were too busy to answer their questions about CAM (Nichols, Sullivan, Ide, Shreffler-Grant, & Weinert, 2005).

It was of interest to the team that most of the respondents in the original study did not interact with CAM providers. The team questioned whether this phenomenon was related to the availability of providers in rural areas and concluded it merited further study. Internet and telephone directory searches were used to locate CAM resources in 20 small rural communities in Montana and North Dakota. Seventy-three providers, representing a wide variety of CAM therapies, were identified in these communities. The team also sought to ascertain the contribution of one type of CAM provider, naturopathic physicians to rural health care (Nichols, Weinert, Shreffler-Grant, & Ide, 2006) through an on-line survey. Most naturopaths were located in population centers, but some offered outreach clinics to rural communities.

In summary, participants in all of these early studies tended to use self-directed or self-prescribed CAM rather than therapies provided by practitioners. Local availability of practitioners did not appear to be a factor in the use of CAM by older rural residents. The residents gleaned information about the therapies primarily by word of mouth or from the media. Some respondents used CAM inconsistently; others did not seek information about the effects or risks, and when they did, the information sources used were those generally considered unreliable.

CAM Health Literacy- A Detour

As on any journey, it is wise to be aware of changing circumstances and respond appropriately. On a road trip, if there is construction indicated ahead, one needs to be prepared to slow, stop, or perhaps take a detour. On our research journey, we became astutely aware of the

growing national focus on the role of health literacy, that is, "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (U.S. Department of Health and Human Services, 2000). Creating a health literate populace had become a major priority in the nation's public health care policy, research, practice, and education arenas. The Institute of Medicine (IOM) included health literacy as one of 20 priority areas and noted that it is fundamental to improving self-management of health conditions (IOM, 2004). The IOM cited a critical need for more rigorous work to develop appropriate, reliable, and valid measures of health literacy (IOM, 2004). More specific to the teams' program of research, the Institute of Medicine also noted that there was very little research on how American consumers obtain, understand, and evaluate information about the various CAM therapies (IOM, 2005). With the advent of these critical documents, there was a clear need for research in the area of CAM health literacy. It was evident to our team that a detour from our focus on informed CAM use was needed. In order to develop and test an intervention to enhance health decision making related to CAM, a measure of CAM health literacy was essential. Prior to developing a measure, it was critical to have a definition and conceptual model of CAM health literacy.

CAM Health Literacy Model Development

The team's working definition of CAM health literacy was the information about CAM that individuals need to make informed health decisions. The MSU Conceptual Model of CAM Health Literacy was constructed from a comprehensive review of the literature, the team's prior research, the definition of CAM health literacy, and input from national experts (Shreffler-Grant, Nichols, Weinert, & Ide, 2013). There are three major components to the model: antecedents, structure, and outcome. The primary outcome of the model is informed self-management of

health. Antecedents are factors that can affect the structural component. Four concepts, dose, effect, safety, and availability, compose the structural component and were the focus for the subsequent CAM health literacy instrument development. The MSU Conceptual Model of CAM Health Literacy is the first known attempt to conceptualize the essential elements of health literacy regarding CAM. Health literacy, in this model, is expanded in a context different from allopathic health care and goes beyond reading and computational skills. (see Figure 1.) The development and refinement of the model was thoroughly discussed in an earlier publication (Shreffler-Grant, Nichols, Weinert, & Ide, 2013).

Figure 1.

Conceptual Model

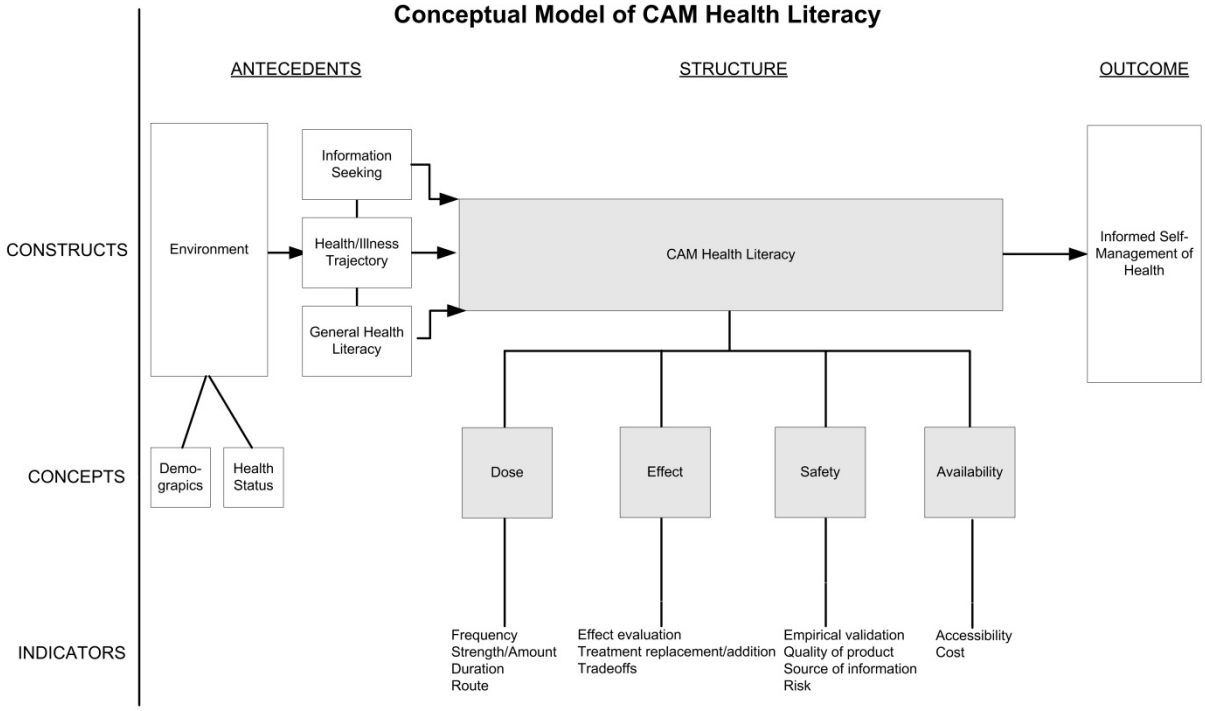

Figure 1 Montana State University (MSU) conceptual model of Complementary and Alternative Medicine (CAM) health literacy. Shreffler-Grant, Nichols, Weinert, and Ide (2013), The Montana State conceptual model of complementary and alternative medicine health literacy. *Journal of Health Communications, 18,* 1193 – 1200. Doi: http://dx.doi.org/10.1080/10810730.2013.778365 . Reprinted with permission of Taylor & Francis Ltd. Http://www.tandfonline.com

Instrument Development

Following the articulation of the conceptual model, the next segment of our research journey was the development of a measure of CAM health literacy. DeVellis' well-established and tested eight-step process for scale development was used to guide our efforts (DeVellis, 2012). (see Table 1.)

Table 1

DeVellis' Guidelines for Scale Development

Step 1	Construct determination
Step 2	Generate item pool
Step 3	Determine measurement format
Step 4	Review of item pool
Step 5	Consider validation items
Step 6	Administer to development sample
Step 7	Evaluate items
Step 8	Optimize scale length

The structural component of the newly developed model provided the constructs and concepts necessary to initiate the instrument development process. Empirical indicators were identified for each of the four major concepts, and two to seven items for each indicator were generated. A six-point Likert scale response format with equally weighted items was selected to allow for a summed single scale score. To ensure that the items were clear and understandable plain language principles (Plain Language, 2013) were used and medical jargon was avoided. Items were written at an 8th grade or less reading level based on the Flesch-kincaid Grade Level (Readability Formulas, 2013).

To refine the item pool, a panel of experts in the areas of tool development and CAM therapy generously reviewed the items for consistency with the model and clarity of wording. They also suggested additional items. A revised item pool and response set was reviewed and

critiqued by four focus groups. Two focus groups were comprised of community dwelling senior citizens and two of allopathic and complementary health care providers. Recommendations from the experts and the focus groups resulted in the team's careful re-review of the item pool. At this point in the journey, the initial instrument consisted of 54 items with two versions of the measure. One version had a dichotomous response option of agree/disagree, the other version had a four-point response set with anchors of agree strongly to disagree strongly.

Refining the Instrument

A professional research interview company was hired to administer the draft CAM health literacy instruments, obtain basic demographic data, including CAM use, and a single item health literacy measure included for validity assessment: the participant's ease of completion of medical forms (Chew, Bradley, & Boyko, 2004). Interviews were conducted with a random sample of 1200 adults over the age of 55 from households in non-metropolitan areas of the north-western quadrant of the United States. One half of the sample (n = 600) completed the version with the four-point response set, the other half with the dichotomous response option.

Decision Point

The availability of resources required a team decision as to how to proceed with the initial data analysis. We had the skill and statistical programs necessary to analyze the four response data set. However, to appropriately analyze the two-response set required different statistical resources and personnel. In addition, DeVellis, a consultant on the project, recommended focusing on the four-point response set. Thus the decision was made to initially analyze only the four-point response set version. The analysis procedures were conducted on one-half of that sample (n = 300), and then were validated by comparing the results with results of duplicate analyses from the second half of that data set. The procedures were then run on the data from the

entire sample (n = 600). Standard exploratory factor analysis procedures with the number of factors (three) based upon parallel analysis were used. Principal components extraction with oblimin rotation was used to determine factors and item loadings. Items with weak loadings or that loaded on more than one factor were deleted. The reliabilities of each factor as well as each item's contribution to that alpha were also examined to determine which items to retain. This process continued until a stable solution with an adequate alpha was obtained. The final 21-item four-response set instrument had a Cronbach's alpha of 0.75. The correlation between the CAM health literacy scale and the medical forms completion item was 0.174 (p = .003) (Shreffler-Grant, Weinert, & Nichols, 2014).

Validation study

The final leg of the instrument development detour was to conduct a study to further assess validity by comparing CAM Health Literacy Scale scores with those on a general health literacy measure. The validation procedures were implemented with a convenience sample of 110 community dwelling older adults (average age 68). The data collection packet included the MSU CAM Health Literacy Scale and two health literacy measures: the Newest Vital Sign (Osborn, et al., 2007) and one question about ease of completion of medical forms (Chew et al., 2004). Also included were basic demographics, CAM use information, and presence of chronic illness. Sixty-six percent of the sample was women, 75% had more than a high school education, and 51% were currently married. Eighty-two percent indicated that they used CAM, and 51% said that they had no significant health problems. The alpha on the CAM health literacy scale in this sample was 0.73. The correlation with the Newest Vital Sign was 0.221 (p = .002) and with the single medical forms completion question was 0.277 (p = .004) (Shreffler-Grant et al. 2014). Now, with an instrument in hand, the team was ready to return to the main trail – how to improve

the CAM health literacy of older rural dwellers and thus enhance the information they bring to bear on the management of their health.

Funding the Journey

Ideally, a program of research is continuously funded; however, life is not always ideal. Yet, there are times when the "financial planets" do align! The launching of our journey fortuitously coincided with the National Center for Complementary and Alternative Medicine becoming a funding agency. This Center funded our first exploratory study and also our most recent work to develop the CAM health literacy scale. Between the two grants, the research journey was sustained by small intramural grants, investigator dedication, the generosity of time and expertise donated by our nursing and non-nursing research colleagues, and the ongoing commitment of the team members. At times we felt like "the little engine that could!"

Lessons Learned on the Journey

This research program has been a journey filled with twists and turns that are likely to continue as we travel down the CAM health literacy path. The success of this research team can be attributed to active, committed investigators, a topic of interest that has engaged all members, and, at least, occasional funding. Maintaining sufficient continuity in the research team while also being open to enlisting help from additional investigators was critical to the development and sustainability of this program of research.

The importance of building from one study to the next was an ever-present precept. We invested significant time and energy reflecting, discussing, and "cogitating" about the results of each step of the research program in order to tease out the meaning from the data and identify remaining questions to be answered along with the most appropriate approaches to answering them.

Being alert to historical events that have relevance to the program of research is critical. The CAM Health Literacy "detour" was inspired by the IOM report which indicated a critical need for more rigorous work to develop appropriate, reliable, and valid measures of health literacy (IOM, 2004). In retrospect, what we thought was a detour may have been a main road on the map. From the outset of our research endeavors, the overall goal was the promotion of informed health care choices by older rural dwellers. Addressing the definition, model, and measurement of CAM health literacy has enlightened and enhanced our research program and is a genuine fit with our goal.

This research journey has not been without obstacles. The several definitions of health literacy complicated the task of developing the model of CAM health literacy. Further, it became clear that there were no markers on the trail, other than our own model, to guide the writing of items and the selection of the response option anchors. An additional challenge was the lack of an appropriate and mature measure of general health literacy against which to validate the MSU CAM Health Literacy Scale. Additional obstacles were the geographic distance between team members along with limited and inconsistent funding.

Reviewing the journey of a team of researchers over time, including the original intent, of the challenges, and the detours, can be instructive to other teams as they travel on their own research journeys. The way is seldom straight, nor paved with continuous funding, but persistence, a meaningful goal, and good working relationships have kept this team on task and energized.

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