



The Stepping On Fall Prevention Program in North Dakota

Project Overview and Summary Report 2012-2020

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Purpose

The goal of this report is to fulfill two specific objectives: (1) to provide a report on statewide program operations and findings for the *Stepping On* fall prevention program in North Dakota from 2012 to 2020; and (2) share information with stakeholders who have assisted and supported implementation of the *Stepping On* program in North Dakota. *Stepping On*, a national evidence-based program, is designed to assist older adults to take control of their fall risk, explore different coping behaviors, and encourage follow-through of safety strategies in everyday life. Implementation of the *Stepping On* program in North Dakota began in 2012, and has been supported through a collaborative partnership between the North Dakota Department of Health, NDSU Extension, and other community professionals and local entities throughout the state.

Evidence-based programs for senior health and wellness have the potential to provide enormous benefits to quality of life and maintenance of daily living activities, particularly for older adults who dwell in their communities. This report highlights the *Stepping On* fall prevention program, its implementation and program operations in North Dakota from 2012 to 2020, and key findings from research with program participants in the state.

Acknowledgments

Collaboration among the North Dakota Department of Health (Division of Injury and Violence Prevention), the North Dakota Department of Human Services (Division of Aging Services), NDSU Extension, and local community entities, professionals and trainers has made possible the implementation of the *Stepping On* fall prevention program in North Dakota. Further, this collaboration and support has made this report possible. We thank these partners for supporting program evaluation and research relevant to this important program.

Work on this project was conducted in association with ND Department of Human Services Contract #190-12479, a contract extended to NDSU Extension to support evidence-based programming with older adult populations. Additionally, we extend our thanks to the professionals and seniors who participated in this project. Their insights and feedback on the *Stepping On* program provided valuable contributions regarding the program in North Dakota. The information for this report was gathered by *Stepping On* program trainers, then analyzed and interpreted by a team of faculty, staff and graduate students in NDSU Extension and the Department of Human Development and Family Science at North Dakota State University. With this study and report, we aspire to enhance the lives of seniors, families and communities in North Dakota. This project is supported by funding from the United States Department of Health and Human Services, Administration for Community Living, Administration on Aging, and granted through the North Dakota Department of Human Services, Aging Services Division.



Summary of Key Findings

Falls are a leading cause of injury and death for older Americans. In fact, national research indicates that one out of every three people ages 65 years and older experiences a fall each year (Tromp, Pluijm, Smit, Deeg, Bouter & Lips, 2001). In North Dakota, falls remain the third leading cause of injury-related fatalities for all ages behind motor vehicle crashes and suicides (North Dakota Department of Health, 2011).

In North Dakota an estimated 28% of older adults experience a fall annually, while a total of 926 residents died due to falls from 2008 through 2017, an average of 92 deaths per year. The majority of falls among older adults occur in their homes.

Evidence-based programs for senior health and wellness have the potential to provide enormous benefits to quality of life and maintenance of daily living activities, particularly for older adults who dwell in their communities. The *Stepping On* fall prevention program, a national evidence-based program, is designed to assist older adults to take control of their fall risks, explore different coping behaviors, and encourage follow-through of safety strategies in everyday life.

This report highlights the *Stepping On* fall prevention program, its implementation and program operations in North Dakota from 2012 to 2020, and key findings from research with program participants in the state. Selected key findings from this report are noted below:

■ **Between March 2012 and March 2020 (8 years), the *Stepping On* fall prevention program grew consistently in North Dakota and has reached a significant number of North Dakota counties and citizens.** These results include:

- Expansion from just seven North Dakota counties in the first two years (2012 and 2013) to 21 North Dakota counties by 2020.
- Increased implementation from ten *Stepping On* workshop sessions in the first two years (2012 and 2013) to 24 workshop sessions in the highest year (2018).
- Outreach to higher numbers of North Dakota citizens, going from 127 participants in the first two years (2012 and 2013) to a high of 287 participants in 2018, with a total of 1,502 North Dakota participants in *Stepping On* through 2020.

■ **Demographic characteristics of *Stepping On* participants in North Dakota from 2012-2020 showed that individuals were typically between 71 and 90 years of age; the majority were female; most identified as White or Caucasian; nearly half were widowed; and a majority lived alone.** More specifically, the results showed:

- Among participants, 74.5% were women while 25% were men.
- With regard to age, 41% were between 71 and 80 years of age while another 36% were between 81 and 90 years of age (total 77%).
- With respect to race or ethnicity, 96% of individuals identified as white, followed by 1.5% who were American Indian or Alaska Native, and the remaining 2.5% in other groups (Black or African American; Hispanic; Asian or Asian American; multiracial; etc.).
- About half of the participants were widowed (49.4%), with 38.3% being married, 6.5% divorced, and those remaining in other partnered categories.
- A majority of individuals lived alone (59.2%), followed by those who lived with one other person (38.2%).

- **With regard to prior fall experience, 46.9% of *Stepping On* participants in North Dakota had experienced a fall at least once in the past year.**
- **Common reasons identified for falls in the past year were a missed step or stumble (31.9%), slipping on ice or snow (16.5%), having a balance difficulty (11.4%), or tripping over an item (rug, chair, etc.) (12.6%).**
- ***Stepping On* participants noted high satisfaction with the program, with 95% of them indicating they had learned about fall risk to a “significant” or “great” extent.**
- **Participants in *Stepping On* indicated becoming much more knowledgeable about fall risks due to participation in the program, increasing their awareness of risks related to vision and falls, balance, home safety hazards, safe footwear, and other fall risk issues.** For example, participant awareness of the importance of balance and strength exercises for fall prevention increased by 62%. Additionally, confidence in understanding safe movement strategies to avoid falls increased by 57%.
- **Involvement in *Stepping On* was strongly linked with increased efforts by participants to take behavioral steps to reduce their fall risks.** Three months following their participation, participants reported:
 - 72.4% reported practicing exercises learned routinely.
 - 94.4% reported practicing techniques for safe transfers, standing, walking, climbing curbs and stairs.
 - 87.3% reported giving attention to safe footwear.
 - 78.6% reported making adaptations to reduce home hazards.
- **North Dakota participants in *Stepping On* responded to open-ended questions about changes most likely to occur due to their participation.** Participants expressed commitment to *increase the quality and quantity of their exercises* after partaking in the program. Also, other changes they intended were *practicing safer techniques while walking, making safety changes to the home environment, and taking steps to increase vision safety.*
- **Additional qualitative feedback from North Dakota participants in *Stepping On* highlighted the positive social connections made in the program, the quality of instruction, and the value of the overall learning experience.** A few selected comments from participants illustrate this feedback:
 - *“This has been excellent. I recommend this to all seniors. Far exceeded my expectations. Great fellowship among participants.”*
 - *“I waited too long to take a class like this – it might have prevented some falls had I taken it 5-10 years earlier. Taking time to think things out and not being in such a hurry all the time. Having the right mindset.”*
 - *“The instructors gave us information for safety, confidence, strengthening exercises. A+ in my opinion.”*
- **In North Dakota, an estimated 28% of older adults (65 years of age and older) experience a fall each year, with an average of 92 deaths per year due to falls from 2008 through 2017. Also in North Dakota, an estimated \$91 million is spent annually on direct medical costs treating fall injuries. Cost-benefit analysis research shows that the *Stepping On* program has an average cost per participant of \$211.38 and an ROI of 64% for each dollar invested. The benefits from averted medical costs were found to greatly outweigh the cost of program implementation.**

Stepping On Fall Prevention Program in North Dakota

Project Overview and Summary Report for 2012-2020



Fall Risk Issues in North Dakota

Falls are a leading cause of injury and death for older Americans. In fact, national research indicates that one out of every three people ages 65 years and older experiences a fall each year (Tromp, Pluijm, Smit, Deeg, Bouter & Lips, 2001). Additionally, it is estimated that 50% of older adults who are 80 years of age or older will fall each year (Soriano, DeCherrie, & Thomas, 2007). The consequences of falls are substantial, including serious injury or death, loss of independent living, social anxiety, and limits on physical activity (Watson et al., 2011). By the year 2020, the total cost of fall-related injuries in the United States was projected to reach \$55 billion annually (Burns, Stevens, & Lee, 2016).

In North Dakota, falls remain the third leading cause of injury-related fatalities for all ages, behind motor vehicle crashes and suicides (North Dakota Department of Health, 2011). Between 2009 and 2013, 89% of falls-related deaths among North Dakota residents were individuals 65 years of age and older. The majority of falls among older adults occur in their homes.

Fall death rates among adults age 65 and older increased almost by 30% from 2009 to 2018. For example, in the United States in 2016, a total of 29,668 individuals aged 65 and older died as the result of a fall (Centers for Disease Control and Prevention, 2019). Falls were the second leading cause of injury-related deaths in North Dakota in 2019, and the first leading cause of injury-related deaths in individuals over the age of 65. A total of 437 North Dakota residents died due to falls from 2015 through 2019, an average of 87 deaths per year (Burns & Kakara, 2018).

The Stepping On Fall Prevention Program in North Dakota

Evidence-based programs for senior health and wellness have the potential to provide enormous benefits to quality of life and maintenance of daily living activities, particularly for older adults who dwell in their communities. The *Stepping On* fall prevention program, a national evidence-based program, is designed to assist older adults to take control of their fall risk, explore different coping behaviors, and encourage follow-through of safety strategies in everyday life. It is a community-based workshop offered once a week for seven weeks using adult education and self-efficacy principles in a small-group setting. Older adults who should attend are those who: a) are at risk of falling, b) have a fear of falling, or c) who have fallen one or more times. Workshops are facilitated by two trained leaders who are professionals who work with older adults.

Implementation of the *Stepping On* program in North Dakota began in 2012 and has been supported through a collaborative partnership between the North Dakota Department of Health, North Dakota Department of Human Services, NDSU Extension, and other community professionals and local entities throughout the state. This report highlights the *Stepping On* fall prevention program, its implementation and program operations in North Dakota from 2012 to 2020, and key findings from research with program participants in the state.



Stepping On Fall Prevention Program in North Dakota

Program Description and Operations for the *Stepping On* Program

The *Stepping On* Fall Prevention Program

In order to increase knowledge of fall risk factors and reduce the potential for falls, organizations such as the Centers for Disease Control and Prevention (CDC) and the federal Department of Health and Human Services furnish resources and program funding for states and communities to provide evidence-based fall prevention programs (National Center for Injury Prevention and Control, 2015). In addition, state and local governments and other stakeholders also provide resources and support for the implementation of such fall prevention programs.

The *Stepping On* program is an evidence-based intervention that focuses on fall prevention and reduction. The program is intended to guide individuals in understanding and managing fall risk factors, share steps for dealing with fall risk and support application of fall reduction steps in everyday living (Strommen, Brotherson, & Yang, 2017). Originally, the *Stepping On* program was developed in the country of Australia under the direction of Lindy Clemson (OT, PhD, University of Sydney, Australia). Rigorous research on the program in that country indicated that participants experienced a 31% reduction in falls compared to those who did not participate (Clemson, Cumming, Kendig, Swann, Heard, & Taylor, 2004). The program operates as a 7-week intervention for individuals seeking a program that can assist them with reducing fall risk and improving their well-being.

In 2008, interest in the *Stepping On* program brought it to the United States under the guidance of Jane Mahoney (M.D., University of Wisconsin-Madison), who began it in the state of Wisconsin. The program was adapted for audiences in the United States and continued research has further validated the positive impacts of the program. For example, additional research has established that participation in *Stepping On* is associated with a 50% reduction in falls for participants and a cost savings of

\$345 for each program participant. The Wisconsin Institute for Healthy Aging (WIHA, 2010) was established to further support the dissemination of *Stepping On* and other helpful evidence-based programs in the United States. The program has been evaluated and meets the criteria for the highest level of evidence-based programs by the Administration for Community Living under Title III-D of the Older Americans Act (National Council on Aging, 2016). The *Stepping On* program has continued to gain interest and is now available in at least 22 states across the nation.

Program Focus and Objectives

Stepping On is designed as an educational and skills training program for use with individuals with fall risk concerns. The program is implemented as a community-based workshop, which is offered as a weekly two-hour workshop for seven weeks, and it uses a small-group educational model based on principles of adult education and self-efficacy. Its primary objectives are:

- Increase awareness of specific fall risk factors.
- Focus on strength and balance needed to limit falls.
- Build skills to manage fall risk factors.
- Implement safety strategies to limit fall risk.
- Build social support and confidence in one's physical and environmental well-being.
- Reduce falls and fall risk among participants.

Individuals who typically attend the *Stepping On* program include those who: a) are at risk of falling, b) have a fear of falling, or c) have fallen one or more times.

Participation in the program typically occurs by self-referral, a referral from a community health professional, or other mechanisms. Also, individuals who are encouraged to participate may live in a variety of residential settings, have the ability to walk without assistance and are not typically using assistive devices for mobility (e.g., walker, scooter), and have the ability to cognitively understand and follow guidance (Clemson & Swann, 2008). The class workshops

are led by two trained facilitators who are professionals working with older adults. After completion of the workshop, participants also benefit by an individual home visit or phone call and a class get-together (“booster session”) after three months. Topics covered in the course include fall risk factors, strength and balance exercises, hazards in the home, safe footwear, vision and fall risk, mobility in the community, medication issues, and other relevant topics.

The *Stepping On* program is a multifaceted program that gives attention to a variety of possible risk factors that are important in reducing falls. The model for the program is based on social learning theory and principles of adult learning, which indicate that a small-group learning environment is the optimal approach for encouraging interaction, shared learning, social support, and change in behavior. In the state of North Dakota, the *Stepping On* program has been in operation since 2012 and has operated primarily under the guidance of the North Dakota Department of Health and NDSU Extension.

Participant Recruitment and Program Sites

Individuals involved in the *Stepping On* program in North Dakota are typically senior individuals at risk of a fall who live in communities that have a trained program facilitator to offer the workshop. As more facilitators have been trained in the state of North Dakota, the potential for offering local workshops has gradually expanded. The program is most commonly offered in urban centers around the state of North Dakota and a local site may offer one or more sessions of the program during a given year. This summary shares information gathered about the operations of the program since its inception in North Dakota in March 2012 through the end of 2019.

Since the *Stepping On* program began in North Dakota in March 2012, there have been 132 workshops conducted across the state. During the time period assessed, reports indicate that a total number of 1,502 participants have been involved in the *Stepping On* program in North Dakota. Not all workshops have gathered evaluation data. However, the available information shows that 621 individuals have participated in 80 *Stepping On* workshops where data were collected. Over the course of the program’s eight years of operation in North Dakota, two yearly class leader trainings have been offered in each year (except in 2017) and 11 complete training opportunities have been held. As a result, 120 *Stepping On* class leaders have been trained in North Dakota, building a substantial number of community professionals who have been certified to offer the program in local communities.

The program sites where *Stepping On* workshops have been held include the following 21 North Dakota counties: Barnes, Benson (Spirit Lake Tribal Community), Bowman,

Burleigh, Cass, Cavalier, Dickey, Emmons, Grand Forks, McIntosh, McKenzie, McLean, Mercer, Morton, Pembina, Ramsey, Richland, Rolette, Stark, Walsh, and Ward counties.

Program Implementation and Participation

Participants who were involved in the *Stepping On* program attended a weekly class session for seven weeks in their local community. The seven-week course was followed up by a single “booster session” held two to three months later, which allowed for further support and assessment with participants. The sessions typically lasted up to two hours with class sessions focused on group learning, discussion, and skills practice. Enhancements to the program typically included program supplies and other supports identified as important to program operation.

Each class session was led by two trained local facilitators who partnered to operate the *Stepping On* program in their community. To highlight specific topics during the course and link class participants with local resources, local community professionals were often invited to attend and share on key topics being addressed in the course for a particular session. For example, an eyecare professional might attend the session on vision and falls and provide important information on this topic and available resources to address related difficulties.

Between 2012 and the end of 2019, the *Stepping On* program was facilitated in 21 counties across the state. Support for the program was funded by the North Dakota Department of Health, which holds the license for its administration in North Dakota. A summary of program participation during the period 2012-2019 is explored below.

The number of residents with a fall risk in North Dakota that have been served by the *Stepping On* fall prevention program has steadily increased. In the inaugural years of the program in 2012-13, 127 residents across the state were

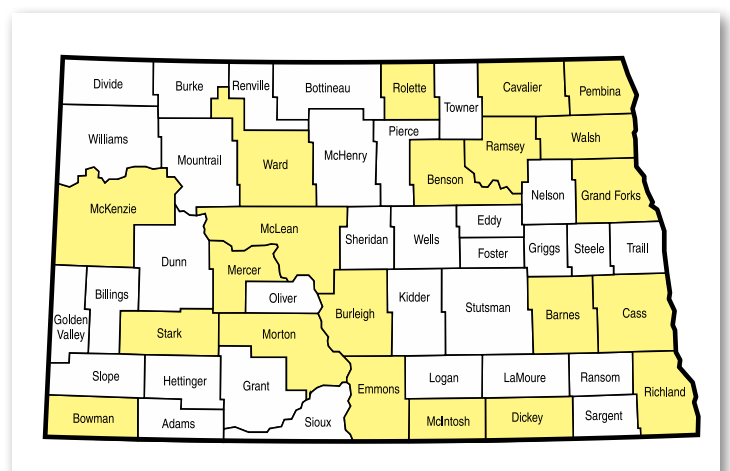


Figure 1: Map of ND Stepping On Sites (2012-2020)

served by the program and 10 workshops were held in that first two years. There were 189 residents served in 2014, 230 residents in 2015, and then 212 families in 2016. The year 2017 saw a substantial increase in residents involved in *Stepping On* with 258 individuals across North Dakota participating in the program. There was a further increase in 2018 when 287 individuals participated in *Stepping On* that year. In the most recent year (2019), there was a decrease as 199 individuals participated in the program across the state. Early in 2020, the COVID-19 pandemic emerged and required the suspension of in-person programming efforts for an indefinite period until classes began again in 2022.

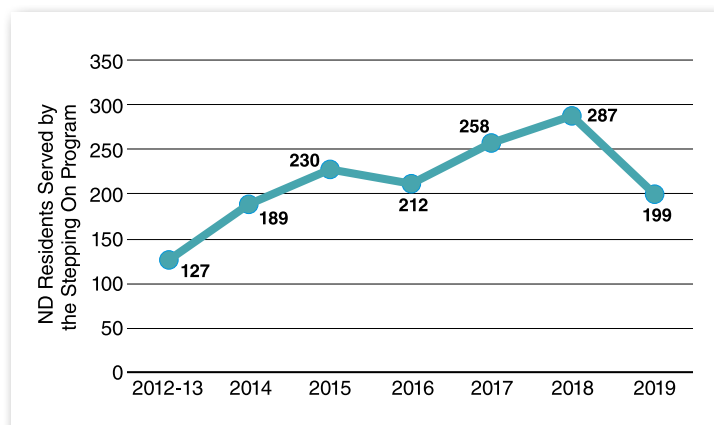


Figure 2: Chart of North Dakota Residents Served by the Stepping On Program

Table 1 provides a summary of *Stepping On* program locations in North Dakota by county and yearly sessions held at those sites from 2012-2020. As noted, there were ten *Stepping On* workshops held in North Dakota during the first two years of its introduction in 2012-13. The yearly total of workshops increased to 17 in 2014, then 23 in 2015. The number of workshops held each year in ND has remained fairly steady since that time, with 20 being held in 2016, 22 in 2017, 24 in 2018, and then 16 in 2019.

An overall summary of the *Stepping On* program and participation data for the years 2012-2020, based solely on available data, indicates the following:

- *Stepping On* operated in 21 counties across North Dakota from 2012-2020, with between seven and 15 counties offering the program in any given year.
- The least number of *Stepping On* program sessions offered was 10 in the initial period of 2012-2013; the highest number of *Stepping On* program sessions offered was 24 in 2018.
- The North Dakota counties offering the highest number of *Stepping On* sessions were in larger population centers, including: (1) Cass County, ND – 21 (Fargo); (2) Burleigh County, ND – 20 (Bismarck); (3) Grand Forks County, ND – 17 (Grand Forks); and (4) Ward County, ND – 8 (Minot). However, other locations such as Benson County (6), Emmons County (6), and Mercer County (7) also offered a substantial number of workshops.

Table 1. Stepping On Program Sites and Sessions in North Dakota (2012-2019)

County Site in ND	Year and Number of Workshops							Number of Workshops	Number of Program Participants
	2012 & 13	2014	2015	2016	2017	2018	2019		
Barnes County, ND			2	1				3	28
Benson Co, ND (Spirit Lake Tribal Community)			1	1	2	2		6	37
Bowman Co, ND	1	1	1	1				4	26
Burleigh Co, ND	2	2	2	1	3	6	4	20	254
Cass Co, ND	2	2	3	3	3	4	4	21	208
Cavalier Co, ND		1			1	1		3	39
Dickey Co, ND			1	2				3	41
Emmons Co, ND				1	2	2	1	6	65
Grand Forks Co, ND	2	3	3	2	2	2	3	17	244
McIntosh Co, ND				1	1			2	18
McKenzie Co, ND		1	1					2	24
McLean Co, ND		1	1		1	1		4	48
Mercer Co, ND	1	1	2		1	1	1	7	92
Morton Co, ND			1	2	1	1		5	57
Pembina Co, ND				1	1			2	27
Ramsey Co, ND		1	2	2				5	48
Richland Co, ND	1	1	1					3	27
Rolette Co, ND					1	2		3	19
Stark Co, ND			1	1			1	3	41
Walsh Co, ND	1	1			1	1	1	5	54
Ward Co, ND		2	1	1	2	1	1	8	105
21 ND Counties	10	17	23	20	22	24	16	132	1,502



Stepping On Fall Prevention Program in North Dakota

Evaluation of the *Stepping On* Fall Prevention Program in North Dakota 2012-2020

Ongoing evaluation of the experience of participants involved in the *Stepping On* fall prevention program has been conducted to assess progress in meeting the program's objectives and assisting individuals. This state-level report for 2012-2020 provides results gathered from multiple years of the *Stepping On* program's operation from spring 2012 through the end of 2019 (from March 1, 2012 to December 31, 2019). These results were compiled using feedback gathered from program participants who completed an evaluation measure designed for the *Stepping On* program. The evaluation measures are briefly summarized below along with the evaluation design. The project report summarizes key aspects of the data available for analysis.

Overview of Evaluation Design

The evaluation process of *Stepping On* primarily used a retrospective pre- and post-program design. Participants were encouraged to complete a retrospective self-report questionnaire at the completion of the program, which followed seven weeks of regular weekly classes. The intent of this process was to allow for assessment of a variety of key indicators among participants before and after their participation in the *Stepping On* program. Three months after completing the program, a program "booster session" was held and participants were again encouraged to complete a follow-up survey. No comparison group data is available.

Several reasons were important in adopting the post-program retrospective study design with this program and population. First, asking participants to provide their feedback immediately at the end of the program can assist them with responses when the program experience is recent and also limits memory concerns if the individual has cognitive limitations related to memory. Second, the retrospective design furnishes a practical, valid approach to assess basic program outcomes, limit response-shift

bias among participants, and account for lack of content familiarity among participants (Nimon, Zigarmi, & Allen, 2011). Additionally, this study design was relatively simple to administer in a community-based setting. This is critical because program staff likely have limited research experience, but this helps them to maximize gathering responses from participants. Also, this design was adopted because there were no funds designated for program evaluation but program stakeholders (state agency personnel, etc.) were interested in information on program outcomes.

Class leaders were responsible for handling informed consent, distributing and gathering the questionnaires, and sending the completed surveys to the state Extension office for evaluation. Data were entered into the IBM SPSS Statistics program for analysis. No incentives were provided for survey completion. The project was approved by the North Dakota State University Institutional Review Board (IRB).

Summary of *Stepping On* Study Measures

As noted, the retrospective post-program questionnaire used for this project was originally developed by NDSU Extension as a program evaluation instrument based on the objectives and content of the *Stepping On* program. Development of this evaluation measure for *Stepping On* offered a more substantive amount of information than the existing tools which accompanied the program materials, which were limited initially to single-session assessments of program satisfaction. The instruments used were: (1) retrospective post-program questionnaire and (2) three-month follow-up questionnaire.

The post-program questionnaire included the following items: six questions related to the demographic characteristics of participants; five questions on perceived value and impacts of the program (four open-ended

questions); seven questions related to knowledge of fall risk factors taught in the program content; and one question on prior fall experience. Additionally, the follow-up survey repeated the question on fall experience (since the workshop), included nine questions on behavioral actions to limit fall risk, and four questions on perceived value and impacts of the program.

Demographics. Specific demographic characteristics that were reported include sex, age, race/ethnic background, family status, household population, and residential setting. Also, additional background information included workshop location and whether the participant had experienced a fall in the past year, and if yes, the cause of the fall. The information on reason for falling was categorized into specific categories.

Perceived program value and impacts. Each of the project questionnaires used a single question to gather feedback on perceived impact of the *Stepping On* program. The post-program survey measured perceived program value with a question about what participants learned on a 5-point scale from 1 (*nothing*) to 5 (*a lot*). The three-month follow-up survey asked a single item about how being involved in the program influenced fall risk reduction on a 5-point scale from 1 (*not at all*) to 5 (*a great deal*). Additional impacts were examined using open-ended questions on each survey, which asked about most important things learned, planned behavior changes, and other feedback.

Knowledge related to fall prevention. The *Stepping On* program engages participants in learning content that is linked to risk of falling and approaches to minimize such risk. The knowledge of participants about risk factors associated with preventing a fall was assessed using multiple questions that asked about their knowledge of content in *Stepping On*. The participant scores were measured using a retrospective self-report approach, in which they assessed their knowledge level prior to the program and their knowledge level at the end of the program. The survey included seven questions on a 5-point scale from 1 (*low*) to 5 (*high*), with such items as “my knowledge of recognizing hazards in home environments” or “my understanding of the relation between medications and falls.”

Behavioral steps linked to fall prevention. Specific actions taken by program participants to limit their fall risk were assessed via a self-report approach in the three-month follow-up survey. This assessment included nine items that participants were asked about and they responded with a simple *no* (0) or *yes* (1) in response to each action step. Some of the items included whether the participant had “talked with a vision expert about improving [their] vision” or “practiced techniques for safe transfers, standing, walking, and climbing curbs or stairs.” The participants were asked to respond regarding their actions in the three months since finishing the program.

Qualitative feedback from participants. Each participant was encouraged to share responses to some simple open-ended questions: (1) Which of your behaviors are you most likely to change? (2) List the three most important things you learned in this workshop. (3) Other comments on the workshop.



Stepping On Fall Prevention Program in North Dakota

Summary of Evaluation Findings for Stepping On Program in North Dakota 2012-20

The *Stepping On* fall prevention program in North Dakota was evaluated using data available from its operations in the state from March 2012 to March 2020. During this eight-year period, over 1,500 individuals participated in the *Stepping On* program in the state. A subset of program participants completed questionnaires following involvement in the seven-week program and also at three months following program completion. Questions asked in the survey included demographic characteristics of participants, program satisfaction, knowledge related to fall risk factors, behavioral steps related to fall risk, and open-ended feedback. The findings related to each of these topical areas are presented in this section of the report.

Basic Characteristics of Program Participants

A total sample of 621 participants from multiple sites enrolled in the *Stepping On* fall prevention program in North Dakota from March 2012 to March 2020 completed surveys that could be used for analysis. A total of 132 programming sessions were held in 21 counties across the state during that time period. Individuals participating in the program completed a retrospective post-then-pre questionnaire following the program that included information on demographic characteristics. Demographic characteristics of **all** individuals who enrolled in the program and completed the program questionnaire are listed below.

■ **Gender** – Women, 73.6% ($N = 457$); Men, 25% ($N = 149$); No Information, 2.4% ($N = 15$)

■ **Age** – Participants ranged from 31 to 100 years of age;
By age group:

- Ages 31 to 40 – 2 (0.3%)
- Ages 41 to 50 – 1 (0.16%)
- Ages 51 to 60 – 15 (2.4%)
- Ages 61 to 70 – 90 (14.5%)
- Ages 71 to 80 – 248 (39.9%)
- Ages 81 to 90 – 217 (34.9%)
- Ages 91 to 100 – 28 (4.5%)
- No Information – 20 (3.2%)

■ **Racial or ethnic background** – By category:

- White or Caucasian – 580 (93.4%)
- American Indian or Alaska Native – 9 (1.4%)
- Black or African American – 3 (0.5%)
- Hispanic – 4 (0.7%)
- Asian or Asian American – 3 (0.5%)
- Other – 5 (0.8%)
- No Information – 17 (2.7%)

■ **Family Status** – By category:

- Never Married – 27 (4.3%)
- Married – 230 (37%)
- Separated or Divorced – 45 (7.2%)
- Widowed – 297 (47.8%)
- Partnered (living with someone) – 2 (0.3%)
- No Information – 20 (3.2%)

■ **Living Circumstances** – By category:

- Lives alone – 322 (51.8%)
- Lives with 1 person – 207 (33.3%)
- Lives with 2+ persons – 13 (2.1%)
- No Information – 79 (12.7%)

These demographic findings indicate that participants enrolled in the *Stepping On* program in North Dakota are more likely to be women than men; tend to cluster in age between ages 71 and 90; are predominantly White or Caucasian; and are mostly a mix of widowed or married individuals. The majority of participants live alone or with one other person. Finally, close to half of the participants had experienced a fall in the year prior to the program.

Prior Fall Experience and Fall Reasons

Since the *Stepping On* fall prevention program is intended to increase usage of fall prevention strategies and reduce fall risk, it is helpful to understand the fall-related experience of individuals prior to their participation in the program. Each participant is asked whether a fall has been experienced in the previous year.

Among individuals who responded (97.6% of survey participants), 45.6% ($N = 283$) indicated “yes” to a fall experience in the previous year. The remainder (52%; $N = 323$) stated “no” regarding a fall experience in the prior year. Thus, nearly one of two participants who entered the program had a fall experience in the year prior to their program involvement.

What are the main reasons that people indicated for experiencing a fall in the prior year? In response to an open-ended question on this topic, participants identified particular reasons for a fall experience (not all listed a reason). These responses were categorized into a set of identified reasons for falls. Table 2 provides a summary of these responses.

Among those who encountered a fall, a third of the respondents ($N = 81$; 31.9%) identified it as being due to a missed step or stumble (varying reasons), while an additional 16.5% of individuals said it was because of slipping on ice or snow ($N = 42$). Thus, approximately half of identified fall reasons (48.4%) in this population are linked with one of these two categories, a careless or inattentive stumble or slipping on ice or snow. Beyond these options, 29 stated the fall was due to a “balance” difficulty (11.4%), 32 because of tripping over an item (e.g., rug, chair) (12.6%), and 25 indicated it was because of an uneven walking surface (9.8%). These three additional reasons account for an additional third (33.8%) of the fall reasons noted. Finally, 19 individuals noted the fall was due to missing a step on stairs (7.5%), 13 suggested it was due to physical injury (e.g., hurt ankle) (5.1%), and others noted footwear or other issues that contributed to the fall (5.1%).

Perceived Program Value and Impacts

Older individuals participating in the *Stepping On* program provided supportive feedback regarding what they learned due to their involvement. The post-program questionnaire included a single question assessing perceived program impact. It was measured using a question that assessed participant learning on a 5-point scale from 1 (*not at all*) to 5 (*to a great extent*). There were 580 *Stepping On* participants who responded to this question.

All respondents felt they learned something from the program, with 95%, or 552 participants, responding they had learned about fall risk “to a significant extent” (20.2%) or “to a great extent” (75%). Also, an additional 4.5% indicated learning “to a fair extent” as well, with an overall mean score of 4.7 out of 5 ($SD = .56$) for the whole group. These results reinforce findings from earlier studies on *Stepping On*, which found high levels of perceived program value and learning among participants. For a graphic figure illustrating these findings, see Figure 3.

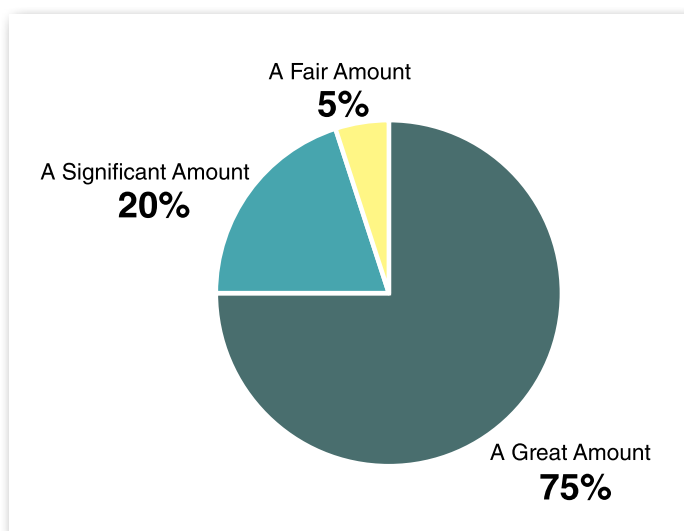


Figure 3: ND Participant Learning About Fall Risk

Table 2. Fall Reasons for Adults in the Year Before Program Participation ($N = 254$)

Identified Reason for Fall	N	%
General misstep or stumble (being careless, feet tangled, etc.)	81	31.9%
Slipping on ice or snow	42	16.5%
Balance difficulties	29	11.4%
Tripping over item (e.g., rug, chair)	32	12.6%
Uneven walking surface	25	9.8%
Missed a step on stairs	19	7.5%
Physical injury (e.g., hurt ankle, bad back)	13	5.1%
Footwear issues	4	1.6%
Other reason	9	3.5%

Perceived Program Impacts on Knowledge Related to Fall Prevention

Older adults in the *Stepping On* program were asked to complete a retrospective assessment of their specific knowledge related to risk factors influencing falls following program completion. These areas of knowledge are linked with specific fall risk factors that can be addressed or modified by adult learners after the program experience. By assessing the older adults' perceptions of their knowledge levels both prior to and following the program, it is then possible to gain further insight into how their experience in the program may have impacted their knowledge gain.

Participants responded to seven items on a 5-point Likert scale with response options ranging from 1 (*low*) to 5 (*high*). The average mean knowledge scores on each item from "before participation" were compared with the scores from "now, after participation," making it possible to do a statistical comparison of the differences in knowledge level before and after program participation. Steps were first taken to assess whether the data met the statistical assumptions associated with this type of analysis. Statistical assumptions were met, and then a paired sample *t*-test analysis was conducted to perform the comparisons and examine whether the program had any impact on participant knowledge levels regarding fall risk factors.

The findings from this project indicate that participants described largely positive impacts as a result of participating in the *Stepping On* program. Table 3 includes the average mean knowledge scores and standard deviations before and following the program, as well as mean score differences, *t*-test findings, and effect sizes. A set of paired sample *t*-test analyses showed substantial increases in participant knowledge of fall risk factors for each item measured and each of the before-and-after mean comparisons was significant ($p < .05$). The mean scores

for self-reported knowledge levels of fall risk factors after participation thus increased significantly versus the mean scores for knowledge levels before the program.

Following the program, participants felt much more knowledgeable about vision and falls, balance, home safety hazards, safe footwear, and other fall risk issues. The largest gains occurred in participant awareness of the importance of balance and strength exercises for fall prevention ($M = 2.95$ before program versus $M = 4.78$ after program) and confidence in understanding how to apply safe movement strategies to avoid falls ($M = 2.93$ before program versus $M = 4.59$ after program). Effect sizes were calculated using Cohen's *d* and indicated large program effects on knowledge gain ranging from 1.32 to 1.67.

Behavioral Steps Linked to Fall Prevention

Following their involvement in the program, participants were asked to complete a follow-up survey three months later and asked about steps taken related to reducing their fall risk. Figure 4 portrays behavioral steps linked to the *Stepping On* fall prevention program taken by participating older adults as reported at the three-month booster session.

Among those who completed the booster session survey ($N = 201$), 59% reported having a regular eye exam, and 48.4% talked with a vision expert about improving their vision. A majority of those who participated, in fact over two-thirds (72.4%), reported practicing exercises they had learned routinely since the workshop. Additionally, 94.4% reported practicing techniques for safe transfers, including while standing, walking, climbing curbs or stairs. With regard to footwear, 87.3% of participants noted that they considered safety features when choosing footwear.

In regard to home hazards and safety, nine out of 10 participants (89.9%) noted that they assessed their home environment for safety hazards, with 78.6% reporting that

Table 3. Differences in Knowledge of Fall Risk Scores Before and After Participation in the *Stepping On* Program (2012-2020)

Knowledge Item	Before		After		t	N	Mean difference	Cohen's <i>d</i>
	Mean Score	SD	Mean Score	SD				
Importance of vision and falls	3.18	1.06	4.65	.58	-31.13	483	1.47*	1.42
Importance of exercises and falls	2.95	1.08	4.78	.50	-39.71	560	1.83*	1.67
Awareness of hazards at home	3.18	1.01	4.73	.55	-35.60	554	1.55*	1.51
Safe footwear and falls	3.19	1.06	4.70	.56	-32.80	551	1.51*	1.39
Applying safety strategies	2.93	1.00	4.59	.60	-38.77	552	1.66*	1.59
Relation of medication and falls	3.02	1.12	4.65	.58	-34.72	548	1.63*	1.60
Bone health and falls	3.33	1.07	4.71	.55	-31.17	553	1.38*	1.32

*Each asterisk denotes a mean score difference that is significant at the $p < .05$ level.

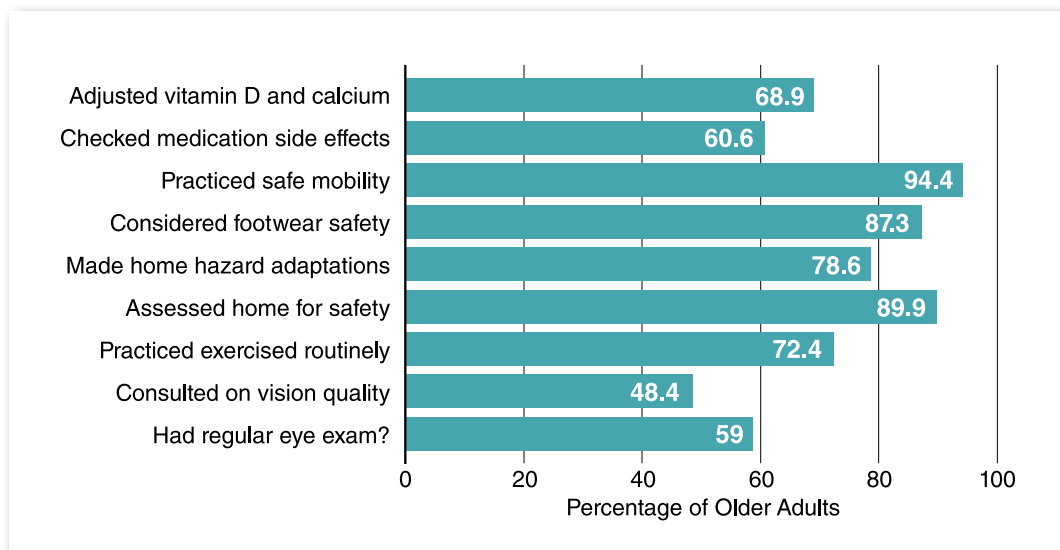


Figure 4. Behavioral Steps Linked to Fall Prevention

they made adaptations or problem solved ways to reduce home hazards. Finally, 60.6 % of participants reported using ways to learn about the side effects of medications, such as talking with a pharmacist or doctor. Also, 68.9% of the adults noted that they have assessed (or know how to determine) intake of vitamin D and calcium and make adjustments to their intake if needed.

Qualitative Feedback on the Stepping On Program

Participants in *Stepping On* were asked to respond to a brief series of open-ended questions at the end of the program. These responses were grouped for each question and analyzed for key themes that emerged in the answers.

Changes most likely to be made. Older adults in the program identified several changes that were most likely to occur due to their program participation. First, participants expressed commitment to *increase the quality and quantity of their exercises* after being involved in the program. Learning and practicing strength and balance exercises was a key element of the program. Also, many participants became *more mindful of practicing different techniques while walking that enhance safety*, such as heel-to-toe stride, form while walking, and gait. Another notable pattern mentioned by participants was *making safety changes to the home environment*, such as removing barriers and adding safety features around the house. Lastly, *taking precautions to care for eye safety* was a notable change. These changes included wearing sunglasses outside, as well as being more alert while traveling around.

General comments on the workshop. Overall, the comments shared by *Stepping On* participants were very positive with three themes emerging:

- 1) **Social benefits.** Participants enjoyed the camaraderie and social connection with everyone in attendance as a whole. Also, they commented on the friendliness of instructors and staff.
- 2) **Quality of instruction.** Multiple comments praised the high-level instruction in the program and voiced their appreciation for the instructors and their delivery.
- 3) **A valuable and informative learning experience.** Many individuals noted that *Stepping On* was a valuable learning experience that informed them in detail about fall risk issues. One participant even hinted at an earlier onset to the prevention program, commenting, “*We should all start to do exercises for falls at 40!*”

To elaborate on the themes above, the following quotes represent participant responses that were shared:

- “*Everybody should attend such a learning opportunity!*”
- “*This has been excellent. I recommend this to all seniors. Far exceeded my expectations. Great fellowship among participants.*”
- “*Everyone is so friendly and it was not only educational, it was fun.*”
- “*I felt the information contained everything I needed to learn about balance – why – when where.*”
- “*I waited too long to take a class like this. It might have prevented some falls had I taken it 5-10 years earlier. Taking time to think things out and not being in such a hurry all the time. Having the right mindset.*”
- “*The instructors gave us information for safety, confidence, strengthening exercises. A+ in my opinion.*”

Program Sustainability and Return on Investment

Thirty million older adults experience a fall annually in the United States, of which 3 million are hospitalized as a result. Common fall-related injuries include concussions, sprains, and broken bones, including an estimated 95% of hip fractures (Centers for Disease Control and Prevention [CDC], 2020; Parkkari et al., 1999). Nationally, the total cost of fall injuries is billions of dollars annually, and results in discomfort, injury, and even death.

Each year in the United States, approximately \$50 billion in direct care costs is spent on non-fatal fall injuries, not including long-term costs such as loss of independent living, loss of employment, and reduced quality of life. An additional \$754 million is spent on expenses related to fatal falls (Florence et al., 2018). Fall injury costs are projected to increase substantially over the next decade as the population continues to age, placing a significant burden on the health care system. Also, 20% to 30% of people who fall suffer moderate to severe injuries that may make it difficult to get around or live independently, increasing the risk of early death.

In the United States, the population of older adults (aged 65 and older) is projected to increase by 30 million over the next two decades (2020-2040) (Ford et al., 2017). In North Dakota, an estimated 28% of older adults experience a fall annually, while a total of 926 residents died due to falls from 2008 through 2017, which means between 85 and 100 older adults die each year in the state due to falls. In North Dakota alone, an estimated \$91 million is spent annually on direct medical costs treating fall injuries, not including long term costs associated with fall injury. Of the \$91 million spent on medical costs treating fall injuries in North Dakota, an estimated \$18 million in funds are private out-of-pocket expenses covered by older adults and their families, placing a significant financial burden on an already vulnerable population (CDC, 2020; Haddad et al., 2019; Florence et al., 2018). This is a significant cost that is expected to trend upwards in coming years as the state population continues to age.

While falls are common in older adult populations, they are not considered a normal part of aging and may be greatly reduced by evidence-based falls prevention programming (CDC, 2020). Fall prevention efforts show promise in reducing falls among older adults and subsequently lowering health care costs. In a randomized controlled trial, older adults who participated in the *Stepping On* program

demonstrated a 31% reduction in falls, while an evaluation of 2,018 *Stepping On* participants in the U.S. showed a significant 50% reduction in falls from six months prior to six months post program (Clemson et al., 2004; Mahoney, 2015; Strommen et al., 2017).

A cost-benefit analysis of evidence-based falls prevention programs found the *Stepping On* program has an average cost per participant of \$211.38 and an ROI of 64% for each dollar invested (Carande-Kulis et al., 2015). The benefits from averted medical costs were found to greatly outweigh the cost of program implementation (Carande-Kulis et al., 2015). Multifaceted fall prevention programs such as *Stepping On* should be strongly considered by organizations concerned with both the efficient use of resources and the prevention of falls among older community dwelling adults. Even a reduction of falls among older adults in North Dakota by one third (30-35%) could save millions of dollars in Medicare, Medicaid, and out-of-pocket expenses for older adults and their families.

Summary

The *Stepping On* fall prevention program has been implemented in the state of North Dakota since 2012. This report summarizes program operations and key research findings related to the *Stepping On* program in North Dakota from 2012 through 2020.

The *Stepping On* fall prevention program in North Dakota has benefited over 1,500 participants since its implementation began in the spring of 2012. Research findings from the program indicate that participants find the program to be beneficial, increase their knowledge about fall risk issues, take steps to ensure greater safety after the program, and appreciate the quality of the program itself. Additional research also shows that the return on investment for such programs is valuable since it reduces injury, enhances social wellbeing, and limits healthcare costs that are incurred when older individuals experience a fall.

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