

Health and Safety Needs of Older Farmers

Part I. Work Habits and Health Status

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RESEARCH ABSTRACT

Farming is an occupation that blends the work and home environments and traditionally involves active participation of all family members, including older farmers. The work patterns of older farmers, including typical work hours, range of activities, and health status, are not well documented. This study, surveying a random sample of older Illinois farmers ($N = 87$), focused on these gaps in the literature. Older farmers were found to work long hours in many farm tasks, more than would be expected in other occupational groups. Further, older farmers were found to have several chronic diseases at higher rates than the general population of the same age and gender; mental health implications were also identified. Rural occupational health nurses are in an optimal position to positively impact older farmers' mental and physical health status.

Farmers have often been viewed as the hardest of all American workers. Indeed, hard physical work and long work hours have been commonplace among American farmers throughout the history of this country. Farmers do daily chores with equipment, plant and harvest crops, and care for animals; this work is completed in multiple farming specialties.

Livestock and dairy farming is particularly grueling work with feeding and bedding large animals and completing animal husbandry activities, as well as hauling manure and managing grain and hay production. These regular activities are intensified in dairy operations because of the punishing schedule of milking animals twice each day, 7 days per week, every week of the year despite inclement weather conditions or ill health. Grain operations involve planting, tilling, and chemical spraying along with equipment maintenance, in addition to harvest. Travel on roadways with large equipment is often required and is viewed as dangerous by farmers and law enforcement personnel (Iowa Highway Safety

Management System, 2001). Adding to this burden is the brief period of time in most of the United States for harvest, typically September through November, despite the number of acres being farmed. Farming is complex and stressful work.

The American work force is aging, and farmers are no exception to this national trend (Allen & Harris, 2005; Hernandez-Peck, 2001; U.S. Department of Agriculture [USDA], 1997). Indeed, farmers work until they are well in their 70s and 80s or older (Myers, 1990; Purschwitz & Field, 1990). The proportion of U.S. farmers over the age of 55 years increased from 37% in 1954 to 61% in 1997. The average age of the Illinois farmer is now 55 years (USDA, 2006a), while the average age of the Iowa farmer is 54 years (USDA, 2006b). Yet, farmers are an understudied population in occupational health. Older farmers, because they continue to actively farm and may have chronic health conditions and take medications, are a population at risk.

This is the first part of a two-part series exploring older farmers' work habits, health status, and agriculture-related injuries in a random sample of Illinois farmers aged 55 years and older. This part focuses on work habits and health status. Part II will report injury experiences. Research questions addressed in this part include:

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Applying Research to Practice

In interactions with older farmers, occupational health nurses should ask several questions to fully understand their occupational and health status. Occupational health nurses should ask farmers if they are receiving preventive health care or ongoing treatment, including medications for chronic health problems. The number of hours farmers work in a week and the effects of physiologic changes of aging on their ability to perform farm tasks are important factors in fully understanding their occupational and health status. Occupational health nurses should suggest modifications in farm tasks or recommend the delegation of some tasks to other farm workers or family members. If farmers report having felt stressed or "down" lately, occupational health nurses should inquire about symptoms of depression, thoughts or plans of suicide, and whether they own firearms.

- How many hours do older farmers work?
- What is the range of activities performed by older farmers?
- What symptoms, diagnoses, and number of medications taken are reported by older farmers?
- How does the health status of older farmers compare to individuals aged 55 years and older in the general population?

METHODS

Sampling and Survey Procedures

A random sample of farmers aged 55 to 70 years was provided by the Illinois Farm Bureau (IFB), Member Services and Public Relations Division. The IFB was chosen as the source for study participants because most Illinois farmers belong to the IFB and may have been more inclined to complete a questionnaire developed and mailed with IFB support. The IFB supplied a random sample of 401 members from a total of 20,000 farmers in the required age group. One of every 25 IFB members was chosen for participation in the study. Sampling was limited to males because the number of female farm owner-operators in Illinois is small, representing only 6% of all Illinois farmers in the age range (USDA, 1997). The random sample was selected with a computer program used by the IFB.

Response rate to the mailed survey with a repeat 3-week mailing was 43% ($N = 173$), considered adequate for a mailed survey. Of the 173 farmers who responded, 13 did not meet basic eligibility requirements because they were younger than the required age of 55 years ($n = 1$), were female ($n = 9$), or were reported deceased ($n = 3$). Six other farmers returned questionnaires, but refused to participate in the study. The remaining 154

respondents included 67 farmers who were no longer working on their farms, for a final total of 87 working farmers. Isolated missing data provided some analysis categories with a total of only 86 working farmers. Of the 67 no longer working on a farm, 33 older farmers did complete the demographic section of the survey for nonworking older farmers.

Ethical Issues

This study followed a large Midwestern university's protocols for research involving human subjects. Research participants were sent an introductory letter about the study along with the questionnaire. The letter clearly outlined participants' rights regarding involvement in the study and provided investigator contact information. Consent was assumed if participants completed and returned the questionnaire to the IFB. Questionnaires were coded to reduce redundant mailings; returned questionnaires were matched to the coded mailing addresses. Only participants who did not return a questionnaire were sent a second instrument.

The principal investigator managed all study data. All completed questionnaires and data computer disks were kept in a locked file drawer. Codes and addresses were confidential.

Survey Instruments

Measures of Work Habits. Measures of work habits included hours of work and range of work activities. In this study, hours of work was defined as those hours a farmer identified as worked in a typical day and number of days worked per week, based on the time of year. Hours of work were determined using the question structure developed in a study conducted by Colorado State University (1992). This structure allowed for the calculation of work variables, including hours worked in a typical day during the week in each of the four seasons, and the number of days worked in a typical week during the four seasons. Work activities were assessed by descriptive questions about type of farming (dairy, grain, livestock, and other) and the type and combinations of farm tasks. Work activity categories included animal handling, farmstead material handling, crop production, farm maintenance, transport of farm equipment or produce, and other farm activities.

Measures of Health Status. Two approaches were used to assess health status. Respondents reported chronic disease, symptoms, and medications through checklist items (Colorado State University, 1992) and a commonly used general health status questionnaire. Respondents were asked to report personal history of symptoms and diseases they had experienced. Medications were assessed by asking respondents about the number of prescribed medications taken in a given day.

General health status of older farmers was assessed by the SF-36 health survey. Because the SF-36 is a widely used measure of generic health status in population groups, it allowed for comparison of farmers with other U.S. citizens in a similar age group. This instrument has

Table 1
Demographics

	<i>Sample (N = 87)</i>	<i>Illinois Farmer Average*</i>
Mean age (years)	62.12	53.40
Principal type of farm	Crop (60%)	Crop (77%)
Mean acreage (acres)	493.23	355.00

**Data from the Illinois Agricultural Statistics Service (2001).*

Table 2
Respondents' (N = 87) Insurance Status*

	<i>Age (years)</i>		
	<i>55 to 59</i>	<i>60 to 64</i>	<i>≥ 65</i>
Private insurance with deductibles ≥ \$5,000	1	3	2
Private insurance with deductibles < \$5,000	31	23	15
Medicare	0	0	22
No insurance	1	1	0

**Some respondents had more than one type of insurance.*

been demonstrated to have excellent reliability and validity in a variety of studies (McHorney, Ware, Rogers, Raczek, & Lu, 1992; Nerenz, Repasky, Whitehouse, & Kahkonen, 1992; Ware, Kosinski, & Keller, 1994). Validity has been established in elderly populations (Lyons, Perry, & Littlepage, 1994). The SF-36 assesses the following health concepts: limitations in physical activities because of health problems, limitations in social activities because of physical health problems, limitations in usual role activities because of emotional problems, bodily pains, general mental health, vitality (energy and fatigue), and general health perceptions (Ware & Sherbourne, 1992).

FINDINGS

Demographics of the Sample

The 87 respondents included in the analysis were representative of other Illinois farmers, as well as other respondents who did not meet inclusion criteria but who completed demographic questions. Ages ranged from 55 to 70 years, with a mean age of 62.12 years ($SD = 4.13$ years). Farmers' median age was 59 years. Most farmers in the study were married (96.6%), with the remaining widowed (2.3%) or single (1.1%). All farmers were White. The number of years in farming averaged 41.7 ($SD = 11.12$ years), with a range of 10 to 66 years (Table 1).

Types of Farming. Farmers reported working on the following types of farms: grain (89.1%), livestock (33.6%), dairy (2.7%), and other (16.7%). Farmers who delineated "other" as a type of farm identified activities such as growing vegetables, raising horses, poultry,

or goats, and harvesting lumber. Many farmers operated combination farms. Thirty-six percent of the farmers operated farms with two or more operations. A few (3.6%) reported three farm operations. However, most farmers operated a grain farm as a single operation; this is consistent with typical Illinois farms (Illinois Agricultural Statistics Service, 2001). Amount of acreage ranged from 1 acre to 3,000 acres, with a mean acreage of 585.52 acres ($SD = 580.89$ acres).

Only 30% of the respondents farmed in an intergenerational partnership. Younger farmers (aged 55–59 years) tended to farm without an intergenerational family member (45%), while the older groups (aged 60–64 years and aged 65 years and older) farmed with an intergenerational family member (34.6% and 38.5%, respectively).

Health Insurance. Most farmers carried private insurance; 6.7% had \$5,000 or greater deductibles, and 80.7% had deductibles less than \$5,000. Four respondents aged 65 years or older did not have Medicare. Only 2% of the farmers had no insurance at all. Additionally, 44.2% of respondents held other jobs along with their farming work, which could explain the number of farmers with private insurance. Table 2 summarizes respondents' insurance status.

Work Habits

These older farmers were involved in a wide range of farming activities. Participants reported performing an average of 3.37 activities in the fall ($SD = 1.71$ activities), and 3.23 activities in spring ($SD = 1.62$ activities). The most common activity for both spring and fall was crop produc-

Table 3
Percentages of Older Farmers Involved in Specific Tasks in the Spring and Fall

<i>Season</i>	<i>Animal Handling</i>	<i>Farmstead Material Handling</i>	<i>Crop Production</i>	<i>Farm Maintenance</i>	<i>Transport of Farm Equipment or Produce</i>	<i>Other Farm Activities</i>
Spring	31%	40%	57%	43%	45%	40%
Fall	31%	34%	55%	50%	40%	30%

Table 4
Mean Hours Worked per Week by Older Farmers Seasonally

<i>Season and Age</i>	<i>Mean No. of Hours Worked per Week</i>	<i>SD</i>	<i>Range</i>
Spring			
55–59 years (<i>n</i> = 32)	58.00	33.67	1–118
60–64 years (<i>n</i> = 25)	66.37	31.83	14–129
≥ 65 years (<i>n</i> = 23)	59.63	40.94	0–132
Fall			
55–59 years (<i>n</i> = 30)	58.02	36.26	0–126
60–64 years (<i>n</i> = 26)	65.83	28.70	14–125
≥ 65 years (<i>n</i> = 23)	60.34	37.84	0–126
Winter			
55–59 years (<i>n</i> = 32)	23.64	22.13	0–70
60–64 years (<i>n</i> = 27)	20.52	22.04	0–84
≥ 65 years (<i>n</i> = 24)	15.23	19.62	0–63
Summer			
55–59 years (<i>n</i> = 32)	47.63	30.79	0–119
60–64 years (<i>n</i> = 27)	43.88	27.06	1–112
≥ 65 years (<i>n</i> = 23)	42.15	28.31	0–98

tion. Another common activity was farm maintenance. The activity reported by the least farmers was animal handling. Table 3 shows the percentages of older farmers involved in specific tasks in the spring and fall.

Although many combinations of the six farm tasks were studied, some patterns did evolve. The most common combinations of tasks were all tasks (*n* = 15; 17%); all tasks except animal handling (*n* = 14; 16%); and crop production, farm maintenance, transport of farm equipment or produce, and other tasks (*n* = 5; 6%).

Older farmers continued to work long hours, particularly in planting and harvest seasons. Mean hours worked by older farmers based on time of year are summarized in Table 4.

The data from respondents reporting 100 hours or more worked per week in spring, fall, and summer were evaluated for outliers. Outliers (extreme values that could be due to measurement errors) were found in spring and fall among farmers who reported more excessive hours of

work. Four outliers, reporting 139 hours or more of work per week, were omitted from calculations of mean hours worked. Although it is reasonable to expect excessive work hours in spring and fall associated with production agriculture, most respondents (95%) reported working less than 130 hours per week.

Health Status

Health status results are presented by the number of farmers reporting symptoms, diagnoses, and medications. These data are followed by the results of the SF-36 instrument.

Symptoms. The most commonly reported symptoms among these older farmers were trouble hearing (49.5%), frequent urination (32.2%), ringing in the ears (30.3%), and shortness of breath (25.2%). Less frequently reported symptoms were dry mouth (15%), trouble seeing even with glasses (14.2%), chest heaviness or tightness (7.5%), wheezing or whistling in the chest (6.7%), and chronic cough (5.6%).

Table 5
Prevalence of Symptoms and Diagnoses

	<i>Study Percentage</i>	<i>Illinois or National Percentage*</i>
Hearing loss	49.2	26.3 (Illinois)
Tinnitus	30.3	9.9 (Illinois)
Hyperlipidemia	41.5	29.7 (national)
Hypertension	34.7	28.5 (Illinois)
Coronary artery disease	8.5	17.8 (Illinois)
Diabetes mellitus	11.9	8.7 (Illinois)
Allergies	17.9	7.0 (national)
Cataracts	6.8	8.8 (Illinois)

*Illinois (Illinois Agricultural Statistics Service, 2001) and national (Centers for Disease Control and Prevention, 1996) percentages reflect ages 45 to 74 years.

Diagnoses. Diagnoses that were commonly reported included hyperlipidemia (41.5%), hypertension (34.7%), allergies (17.9%), and diabetes mellitus (11.9%). Other diagnoses reported were coronary artery disease (8.5%), cancer (7.6%), and cataracts (6.8%).

Differences were noted in common symptoms and diagnosed diseases reported in this study and national or Illinois norms. Table 5 compares the sample of this study to Illinois or national norms for farmers aged 45 to 74 years. Interestingly, the percentages of many of the reported symptoms or diseases in this study sample were above Illinois or national norms. However, the age range of the sample for this study was 55 to 70 years, which differs from the age range for the normative data.

Medications. Most older farmers (aged 65 years and older) took more than 1 to 2 medications ($n = 23$; 56%), while the youngest farmers (aged 55–59 years) took no medications ($n = 15$; 43%). Additionally, less than half of the farmer group aged 60 to 64 years took no medications ($n = 15$; 39%), while most of that age group took more than 1 to 2 medications ($n = 23$; 59%). A small number of farmers in each age group took 5 or more medications [(aged 55–59 years, $n = 3$; 8%), (aged 60–64 years, $n = 5$; 13%), and (aged ≥ 65 years, $n = 2$; 5%)].

General Health Status (Results of the SF-36 Health Status Survey). In reviewing the SF-36 results, a few key points are important. First, with norm-based scoring, scores below 50 represent values below the general population, and scores above 50 represent values above the general population (Ware et al., 1994). For example, a score in vitality of 53 would mean that the respondent reported a greater level of vitality than the general population of the same age. Second, a difference between a study norm and a U.S. norm of 2 to 4 points is equivalent to a small effect size, whereas a difference of 5 to 7 points would be equivalent to a moderate effect size. The difference between farmers aged 55 to 59 years and the norm in the area of mental health would reflect a moderate effect size. Further, the SF-36 analysis in this study was com-

pleted by the Q Metric researchers for the authors using highly reliable procedures.

Findings from the SF-36 analysis revealed a small to moderate effect size or a difference between the study population and the U.S. norm for that item. Younger farmers (aged 55–64 years) scored about the same as U.S. male norms of the same age in physical function, bodily pain, general health, vitality, and social function. They scored only slightly better in the physical component summary, but worse in role function (effect size of 3.490), role emotional (effect size of 2.276), mental health (effect size of 5.698), and mental component summary (effect size of 3.230). Older farmers (aged 65–74 years) scored about the same as the U.S. male norms of the same age in the mental component summary, but generally better in most other categories, including physical function (effect size of 6.499), role function (effect size of 3.951), bodily pain (effect size of 3.541), general health (effect size of 2.283), vitality (effect size of 3.819), social function (effect size of 6.236), role emotional (effect size of 4.136), and physical component summary (effect size of 5.429). They scored worse than the general population in only one category, mental health (effect size of 3.241).

DISCUSSION

Despite the study limitations of small sample size and methodological weakness, several implications for occupational health nursing practice emerged. It is clear that older Illinois farmers in this study continue to work long hours, typically 10 to 12 hours a day, at what most would consider traditional retirement age (i.e., older than 65 years). These long workdays require physical ability, stamina, and mental alertness, all of which have potential to change with age and fatigue. Long workdays, combined with the variety of tasks reported by farmers in this study, suggest that older farmers do not alter their work patterns as they age. This is not typically the case in other occupational groups. Further, nearly half of respondents (44.2%) held another job outside of farm work.

Some discussion is warranted about SF-36 results in this study. Farmers aged 55 to 59 years reported more emotional stress; a significant relationship between self-reported stress and injuries was also observed in this age group. This could have resulted from farmers who had experienced injuries possibly being more inclined to respond to this survey.

Physical scores are also worthy of discussion. One would think that the years of heavy physical work would result in older farmers' lower physical functioning scores compared to those reported by the general U.S. population of the same age. However, in this sample of older farmers, reported physical functioning scores were higher, suggesting that physical activity may indeed be protective of functional ability. The relationship between activity and functional ability can be applied to occupational health nursing practice. Occupational health nurses who interact with older farmers should incorporate questions to determine whether the farmers' functional ability matches their perceived functional ability. They should also assess whether the farmers' functional ability is appropriate for the tasks they report performing on the farm.

Health status is also a consideration for occupational health nurses. Farmers in this study reported a variety of symptoms that may warrant further investigation (e.g., shortness of breath, chest heaviness, frequent urination, dry mouth, and symptoms of hearing loss, expected in this older population). Further, despite the number of reported chronic diseases and symptoms, approximately one third of farmers 65 years and older reported taking no medications ($n = 12$; 29%). Additionally, although farmers fared well when compared to the general population of similar age using the SF-36 instrument, mental health scores were lower than the general population.

Physiologic changes associated with aging (e.g., changes in hearing, visual acuity, balance, reaction time, and stamina) may impact functional ability in leisure and work environments. Occupational health nurses working with older farmers should ask pertinent questions when assessing these clients. Occupational health nurses play several roles in working with older farmers, including promoting health and explaining the changes associated with aging as well as the influences of health status, chronic disease, and medication use on work safety. Occupational health nurses can promote health status by counseling older farmers to stay as active as possible, eat healthy diets, and drink plenty of fluids. They can also encourage older farmers to rest appropriately to promote optimal functioning in their farm work.

IMPLICATIONS FOR OCCUPATIONAL HEALTH NURSES

Occupational health nurses should assess older farmers' work responsibilities by taking a thorough work history. Work history is important because farmers may have another job outside of farm work. Farmers may also work excessive hours depending on the season. Farmers with long work hours or more than one job may experience fatigue and stress in juggling those responsibilities. Occupational health nurses should not

assume that farmers older than 65 years are retired or working reduced hours. Farmers older than 65 years in this study reported performing multiple tasks and working long hours.

Farmers aged 55 to 60 years should be assessed for mental health problems, including depression, anxiety, and emotional stress. In this small sample, a relationship was observed between emotional stress and injury among farmers aged 55 to 60 years. This age group also scored lower than the general population of the same age in role function, role emotional, mental health, and mental health summary (SF-36 measures), suggesting that farmers aged 55 to 60 years may experience more mental health issues than other age groups.

CONCLUSION

Responses to work pattern questions indicate that long hours and a variety of tasks are the mainstay of older Illinois farmers' work. Although this survey could be replicated with a larger population, implications for occupational health nursing practice are evident. In interactions with older farmers, occupational health nurses should focus on a careful occupational history, systematic review of systems, and mental health assessment, particularly to assess depression. Occupational health nurses should also inquire about other occupational responsibilities because many respondents in this study held other jobs besides farming. Clearly, older farmers are a significant occupational group in many rural areas with risk of occupational injury or death; occupational health nurses offer a unique skill set in partnering with these clients.

The authors thank the Illinois Farm Bureau, Dave Patton for partial funding for mailings, Andrea Doughty, PhD, and Michael Glasser, PhD, for statistical assistance, and Ann Minnick, PhD, and Linda Edwards, DrPH, for their expertise.

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