

# Personal Disaster and Emergency Support Networks of Older Adults in a Rural Community: Changes After Participation in a Preparedness Program

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## ABSTRACT

**Objective:** Personal disaster and emergency support networks of rural older adults are described before and after participation in a disaster preparedness intervention, *PrepWise*.

**Methods:** At baseline, a total of 194 disaster support network members were identified by 27 older adults in a rural Midwest community. After the intervention, these participants identified 232 support network members. Multilevel logistic regression models were constructed to identify characteristics of the network members and social interactions associated with support providers at baseline as well as newly added support sources after the *PrepWise* intervention.

**Results:** Member and interaction characteristics associated with being identified as emergency support sources at baseline were as follows: family, lived in close proximity, weekly or more frequent contact, and being someone whom participants shared concerns with, trusted, and exchanged emotional support with. After receiving *PrepWise*, participants on average identified 3 new sources of emergency support within their networks. Support sources added at follow-up tended to be nonfamily members and those participants trusted.

**Conclusions:** Enhancements in personal emergency support networks occurred after the intervention. Understanding characteristics of the network members and social interactions may assist in identifying additional emergency support sources. Larger studies investigating the impacts of enhanced support networks on disaster-related behaviors and outcomes will be beneficial. (*Disaster Med Public Health Preparedness*. 2017;11:110-119)

**Key Words:** preparedness, older adults, rural community, social support networks

Disasters and emergency situations continue to create great public health challenges in our society. In 2014, the Federal Emergency Management Agency (FEMA) declared 84 major disaster situations in the United States affecting 36 states and territories<sup>1</sup> and causing over \$18 billion in estimated losses.<sup>2</sup> Disasters cause tremendous negative impacts on the physical, emotional, and economic well-being of those affected. Some subgroups of the population, such as older adults and individuals with medical care needs, are especially vulnerable in such situations.<sup>3</sup> Various agencies have called for additional public health research to address the devastating impacts and outcomes of disasters and emergency situations for these population groups.<sup>3,4</sup>

Older adults face disproportionately higher rates of mortality as seen from recent disaster situations including Hurricane Katrina and Hurricane Sandy.<sup>5,6</sup> Of the 1200 people who died from Hurricane Katrina, 74% were over the age of 60.<sup>6,7</sup> Currently in the

United States, nearly 80% of older adults have at least one chronic health condition requiring daily care,<sup>4,6-8</sup> and about 10 million adults ages 65 and older reported having serious difficulty walking or climbing stairs, suggesting the need for assistance in evacuating during and after disaster or emergency situations.<sup>9</sup>

Although many older residents in the community live independently, disaster and emergency situations may limit their access to community services and resources.<sup>4</sup> For example, blocked or closed roadways and limited access to public transportation<sup>5</sup> can prevent older adults from obtaining medications, medical care, food, and products of basic daily needs.<sup>4,10</sup> Older adults who receive community-based services such as meal delivery and home health care may also experience a disruption in services when providers cannot reach them. For older adults, interruptions in such services can significantly diminish their ability to function independently and to maintain well-being, potentially resulting in more serious

and long-term medical conditions.<sup>5,11</sup> Therefore, being prepared for disaster and emergency situations is especially important for older adults living in the community setting to ensure their survival and prolonged independent living.

A great deal of public health efforts have focused on community resilience, for example, by building infrastructure of emergency responses and support systems for the general public.<sup>12</sup> Efforts have also focused on building community infrastructure of disaster response systems that specifically address older adults.<sup>13</sup> Disaster planning information for older individuals is available from governmental and nonprofit agencies in the United States.<sup>13-18</sup> These guidelines focus on listing actions that should be taken or resources to be gathered by older adults and their families in preparation for emergency situations. In addition, older adults can register with their local emergency management agencies to indicate their needs for evacuation or medical assistance in case of emergency or disaster.<sup>8</sup>

Although such plans are in place, emergency responders and aid workers often cannot reach residents in a timely manner owing to the nature of many disaster and emergency situations that affect large geographic areas.<sup>19</sup> Therefore, it is recommended that individuals be prepared to survive independently for a minimum of 3 days.<sup>18</sup> Yet, studies show that older adults have lower levels of preparedness than do younger adults,<sup>15</sup> and that less than 25% of older adults in the United States report having an emergency plan.<sup>20</sup> Furthermore, older adults report difficulty preparing for such situations owing to financial and functional limitations and complexities in recommended actions,<sup>21</sup> highlighting the need for individual-level interventions to help them become prepared.

Familial and community support can improve individuals' ability to handle disasters. Studies have shown the importance of family and community resilience in disaster outcomes.<sup>22-25</sup> Older adults living in a rural setting tend to be more socially isolated than their urban counterparts<sup>26</sup> and thus vulnerable in disaster and emergency situations. Furthermore, reports indicate that disaster and emergency response systems in rural areas are often challenged owing to the geographic dispersions of residents and services and the low availability of emergency responders and volunteers.<sup>14,19,27</sup> Having a strong personal support network is particularly important for older adults living in rural areas. Although some older adults feel that they are well protected by community-based disaster plans and response systems,<sup>28</sup> it is important that they are made aware of the limitations of such systems and be encouraged to develop personal emergency support networks that can be activated when needed.

Vast literature on social networks and social support indicates the importance of personal support networks for the health and well-being of older adults.<sup>29-31</sup> However, less is known

about the personal emergency support networks of rural older adults, and whether and how their networks can be targeted in interventions to strengthen support, particularly in situations like disasters. In order to enhance the outcomes of disaster and emergency situations among older adults within the community, it is important to gain an understanding of the nature of personal networks that can be activated when needed and how to potentially enhance such personal emergency support systems. The purpose of this research was to explore the characteristics of the personal support networks of rural older adults in relation to disaster and emergency preparedness among those who participated in a disaster and emergency preparedness program.

*PrepWise*, a disaster preparedness training program for community-based older adults, was adapted from disaster preparedness programs for adults with disabilities<sup>32</sup> and for families of children with disabilities, *PrepKids*.<sup>33</sup> *PrepKids* was shown to be effective in improving disaster preparedness behaviors in a controlled randomized trial in rural Iowa.<sup>33</sup> *PrepWise* was adapted through a thorough theory-based formative research process that involved in-depth interviews with older community residents and community-based service providers including meal services, home health care, and homemaker services. Similar to the approaches used in the *PrepKids* program, *PrepWise* is designed to assist older adults in developing tailored household-based preparedness plans. A detailed description of this formative research and the impact of *PrepWise* on preparedness behaviors and participants' perceptions are provided elsewhere.<sup>28</sup> In the current study, older adults participated in a 1-hour small group training session during which an experienced disaster preparedness educator walked through each module discussing the contents and assisting the participants to fill in the workbook as needed. The 7 modules of the *PrepWise* program are as follows: (1) knowing types of emergencies and what to do, (2) vulnerability assessment (alerts/warnings, evacuations, transportation, communication, sheltering, personal care, and medical care and equipment), (3) developing a personal emergency support network (formal list of family/friends and local community members), (4) making an emergency plan, (5) keeping a supply of medication, (6) making an emergency supply kit, and (7) making home, school, work, and car travel safer.

A key preparedness activity addressed in module 3 of the intervention was to improve the personal emergency support networks of the participants. In this module, participants were made aware of the need to be self-sufficient after disaster and emergency situations for a period of time before emergency personnel could reach them and were asked to develop and document their own personal emergency support networks by using a worksheet provided (Figure 1). Participants were instructed to consider not only their family but also friends and neighbors who may be able to assist them with emergency-related tasks (eg, evacuation, provide

FIGURE 1

Worksheet to Develop Personal Emergency Support Networks.

Personal Emergency Network Form: Example

How to Fill out This Form:

- 1 Fill in the name and contact information of three people who can help you in case of an emergency.
- 2 Under each person's name, mark an "X" next to each activity they can help you with.
- 3 Please indicate which person should be called upon first, second, and third if needed.

		Support Provider	Support Provider	Support Provider
Name:		Sally Jones	Harry Martin	Chris Nelson
Relationship:		Sister	Son	Neighbor
Phone:		(123) 456-7890	(555) 666-7777	(987) 654-3210
Address:		555 Main Street	987 Memory Lane	222 10th Avenue
Alert/Warning		X (1)		
Preparation	Planning	X (1)	X (1)	
	Shopping	X (1)	X (2)	X (3)
	Making Kit	X (1)		
	Immediate Threat	X (2)		X (1)
	Other			

Personal Emergency Network Form

		Support Provider	Support Provider	Support Provider
Name:				
Relationship:				
Phone:				
Address:				
Alert/Warning				
Preparation	Planning			
	Shopping			
	Making Kit			
	Immediate Threat			
	Other			
Evacuation	Fire			
	Tornado			
Provide Shelter	Short-term			
	Long-term			
Help with Care	In Home			
	In Shelter			
Transportation	To Shelter			
	To Errands			
	To Home			

shelter, transportation, preparing emergency supplies) when developing their emergency support networks. Participants were then instructed to contact the individuals they listed and to discuss their emergency plans to make them aware of the plan.

The aim of this study was to evaluate the compositional and relational characteristics of the personal social support network systems of rural older adults as they specifically related to disaster preparedness and response. More specifically, we evaluated their existing support networks before their participation in the *PrepWise* program and evaluated the changes in their networks after the intervention. The following research questions were addressed:

1. *Who can older adults turn to as potential providers of support and assistance in case of emergency?* We described the characteristics of the social network members who (1) participants “can turn to for help and guidance in emergency” or (2) “would come to assistance if something went wrong” before their participation in the intervention. The characteristics of individual network members as well as the characteristics of the social interactions the participants have with them were explored.
2. *How did emergency support networks change after older adults participated in the preparedness intervention?* After the intervention, the characteristics of the additional emergency support providers and the social interactions the participants have with them were evaluated.

## METHODS

This study involved pilot testing of the *PrepWise* program. Thirty adults aged 60 years and older participated in a one-time group session to receive training on *PrepWise* and reported their personal support networks before and 1 month after the intervention. Five groups were held at a local senior center (2 groups; 10 participants), a church (1 group; 8 participants), and a government-subsidized apartment building for older adults (2 groups; 12 participants). Participants were recruited by research staff who visited each site and presented information about the project and enrolled participants in the study. At the time of the study enrollment, all participants provided written informed consent and received a baseline survey. Participants returned the completed surveys when they arrived to participate in the *PrepWise* program. One month after participation in the program, the research team phoned all participants to inquire about their preference for completing the follow-up survey. Of the total participants, 12 choose to have the follow-up survey mailed to them. All 12 of these participants mailed back a completed follow-up survey. In addition, 9 participants indicated a preference to complete the follow-up survey through a telephone interview, and 6 preferred an in-person interview. Three participants did not complete the follow-up survey. Each participant received a \$20 gift card to a local

retail store after completing the baseline survey and participating in the training and then received another \$10 gift card after completing the follow-up survey. The Institutional Review Board at The University of Iowa approved all procedures of this research.

## Measures

### *Personal Emergency Support Networks*

At baseline, participants listed (1) the members of their household and (2) other “family, friends, or neighbors whom [the participant] can rely on or may be able to help in an emergency situation.” In the post-intervention survey, participants were first presented with the list of network members from their baseline responses and were then asked to list “anyone else who now lives with [them]” and “anyone else like family, friends, or neighbors whom [they] can rely on or may be able to help in an emergency situation” that were not listed at baseline. Because the program emphasizes the importance of household readiness, co-residents were expected to be included in their emergency plans. Given the short follow-up period, no one reported a change in their household composition. Social network sizes were calculated at baseline and follow-up by counting the total numbers of members participants had on their lists at each assessment, with differences between assessments representing changes in network size.

For each network member listed, participants provided information regarding his or her gender, approximate age, relationship (eg, spouse, child, sibling, friend, neighbor), place of residence (eg, live together, city and state), and frequency of contact (ie, face-to-face, over the telephone, over the Internet) at baseline. Information regarding the network members added at follow-up was collected at follow-up by use of the same questions. Indicators were created for each network member being female, living with the participant, living within a 1-hour drive of the participant, being family, or being a relative (as opposed to network members who were not family members, such as friends, coworkers, service providers, and neighbors), and whether the participant saw the member in person (see frequently) and interacted with the member by phone or over the Internet (talk/Internet frequently) once a week or more.

### *Emergency Support Providers*

While looking at the list of support network members, participants further specified members who they considered as sources of emergency support by answering 2 questions: (1) “Whom can you turn to for help and guidance in times of emergency” and (2) “If something went wrong, who would come to your assistance?” The first question aimed to elicit the presence of support providers who can help participants prepare for disasters or emergency or mitigate threats, and the second question aimed to elicit those who can provide assistance after emergency situations have occurred. Participants responded to the same 2 questions both at baseline and



at follow-up regarding each network member in order to assess potential changes in perceptions. For the first set of analyses investigating the characteristics of emergency support providers at baseline, we created an outcome variable to indicate whether each network member was selected for at least 1 of the 2 questions stated above (emergency support provider). For the second set of analyses investigating the enhancement of the personal emergency support network, an outcome variable indicated whether each member added at least one type of support (one or both questions above) at follow-up that was not identified in baseline (newly added support source after the program).

**Social Interactions**

Participants also selected members with whom they had certain types of social interactions by answering 4 questions: “With whom do you share your concerns?” (share concern); “Who helps you? Help may include tangible aid and services like shopping and housework” (instrumental support); “Who supports you emotionally?” (emotional support); and “Who do you feel you can trust?” (trust). Responses were coded as 1 if selected and 0 if not selected for each network member for each question. Responses provided at baseline were used for the first and responses to the follow-up survey for the second set of analyses.

**Participant-level covariates**

Participants self-reported their demographic information at baseline. Age and gender were considered as covariates in the analyses. Other factors (eg, race, marital status, employment status, income) were not included owing to lack of variability in responses and the small sample at the participant level.

**Analyses**

Descriptive statistics were examined to evaluate the characteristics of the participants, personal emergency support networks, and the network members and how the networks changed. Factors associated with 2 outcomes, (1) network member who would provide at least one type of emergency support at baseline and (2) member who added at least one type of emergency support at follow-up, were examined by using two-level logistic regression models with random intercepts to account for the clustered nature of the data in which members are nested within the support networks of each participant<sup>34</sup> by using HLM 7.01.<sup>35</sup> Both analyses included the same participant-level (Level 2) covariates (ie, age, gender, network size) and considered the same set of network member-level (Level 1) explanatory variables including the characteristics of the network members (ie, female, live within a 1-hour drive, family/relative, see or talk/Internet frequency) and quality of the interactions (ie, share concerns, instrumental support, emotional support, trust).

Bivariate associations between each of the explanatory variables and each of the outcomes were evaluated first.

One multivariable model was built for each outcome, and because this exploratory study involved predictive modeling, significant explanatory variables were identified through a backward elimination procedure to derive a final model. Statistical significance was based on a Type I error rate of 0.05 in the final model with covariates, and 95% confidence intervals were constructed for odds ratios.

**RESULTS**

**Characteristics of the Participants and Their Emergency Support Networks**

Twenty-seven participants who completed both the baseline and the follow-up surveys reported a total of 194 network members at baseline, with an average network size of 7.2, ranging from 1 to 23. The average age of the participants was 74.6 years (SD = 8.45), ranging from 61 to 92 years, and most were female (82%), lived alone (81%), were white (93%), and were not employed (80%). Half of the participants reported annual household income of \$20,000 or less (Table 1). The characteristics of the network members and social interactions are presented in Table 2. Half of the network members were close family of the participants such as spouse, parents, siblings, children, and grandchildren, whereas 36% were not family members (eg, friends, service

**TABLE 1**

Characteristics of the Participants and Their Social Networks (N = 27)		
	Mean (SD) or Frequency (%)	Range
<b>Age, years</b>	74.62 (8.45)	61-92
<b>Female</b>	22 (81.5)	
<b>Married<sup>a</sup></b>	7 (25.9)	
<b>Live alone<sup>b</sup></b>	21 (80.8)	
<b>Race</b>		
White	25 (92.6)	
African American/Other	2 (7.4)	
<b>Education</b>		
High school degree	7 (25.9)	
Some college	5 (18.5)	
College degree or more	15 (55.6)	
<b>Employment</b>		
Currently employed	5 (18.5)	
Currently volunteer	5 (18.5)	
<b>Income<sup>c</sup></b>		
Under \$20,000	12 (50.0)	
\$20,000–39,999	4 (14.8)	
\$40,000 or more	4 (14.8)	
<b>Network characteristics: network level</b>		
Size: baseline	7.19 (5.84)	1-23
Size: follow-up	8.59 (5.78)	1-23
Members added	1.41 (1.55)	0-6
Members who added support	2.93 (3.98)	0-14

<sup>a</sup>“Not married” included never married, divorced, separated, widowed, and no spouse.

<sup>b</sup>Information on “live alone” was available for 26 participants.

<sup>c</sup>Information on income was available for 20 participants.

TABLE 2

## Characteristics of the Social Network Members

	Baseline (N = 194)		Newly Added to Network at Follow-up (N = 38)		Follow-up (N = 232)		Added at Least 1 Type of Emergency Support at Follow-up (N = 79)	
	Mean (SD) or Frequency	Range or (%)	Mean (SD) or Frequency	Range or (%)	Mean (SD) or Frequency	Range or (%)	Mean (SD) or Frequency	Range or (%)
Age, years <sup>a</sup>	60.15 (19.54)	0-91	53.44 (14.60)	30-74	59.16 (19.01)	0-91	57.84	13-91
Emergency support provider	125	64.4	29	76.3	137	59.1	36	45.6
Network member female	119	61.7	20	52.6	139	59.9	36	45.6
Live together	4	2.1	0	0	4	1.7	0	0
Live within 1-hour drive	124	63.9	33	86.8	157	67.7	58	73.4
Close family (spouse, parent, sibling, child, grandchild) <sup>b</sup>	97	50.0	7	18.4	104	44.8	24	31.2
Other family (extended)	20	10.3	10	26.3	30	12.9	17	21.5
Not family (friend, service provider, coworker) <sup>b</sup>	70	36.1	19	52.8	89	38.4	36	45.6
Family/relative <sup>b</sup> (combined close and extended family)	117	62.6	17	44.7	134	57.8	41	53.2
See weekly or more <sup>c</sup>	98	50.5	22	57.9	120	51.7	48	61.5
Talk/Internet: weekly or more	97	50.0	14	36.8	111	47.8	38	48.7
Share concern	112	57.7	14	36.8	122	52.6	22	44.0
Instrumental support	31	16.0	15	39.5	66	28.4	4	8.0
Emotional support	115	59.3	18	47.4	133	57.3	29	58.0
You can trust	133	68.6	26	68.4	163	70.3	30	60.0

<sup>a</sup>Information on network member's age was missing for 38 members at baseline and for 49 members at follow-up.

<sup>b</sup>Information on relationships was missing for 7 members at baseline and for 9 members at follow-up.

<sup>c</sup>Frequency of interaction was missing for 4 network members at baseline and follow-up.

providers, coworkers), and the remaining members were other relatives and extended family such as nieces or nephews (5%), sons- or daughters-in-law (5%), and brothers- or sisters-in-law (3%). About half of the network members were identified as someone respondents saw at least weekly. Most network members were someone respondents shared concerns with (58%), could trust (69%), and received emotional support from (59%).

### Changes in Personal Emergency Support Networks

One month after the *PrepWise* intervention, participants identified 38 additional network members (each participant adding 1.4 new members on average), increasing the total number of social network members to 232. Thus, the average network size increased from 7.2 at baseline to 8.6 at follow-up. At baseline, a total of 125 network members (64%) out of all 194 members listed were identified as sources of emergency support (selected for at least 1 of the 2 questions described above; see *Emergency Support Providers* in the Measures section). Participants identified 52% of the network members as someone they "can turn to for help and guidance in an emergency" and 54% as someone who "would come to assistance" if something went wrong; 41% were identified as someone who would provide both types of support (data not presented in table).

At follow-up, a total of 137 network members (59%) out of the 232 members were identified as sources of emergency support (at least one type of support in times of emergency). Furthermore, 79 social network members were identified as someone who would provide at least one additional type of support ("turn to for help" or "would come to assist") that was not present at baseline; this included 29 of 38 members who were newly added to the network at follow-up. Therefore, on average, each respondent gained about 3 emergency support sources after the *PrepWise* intervention.

### Characteristics of the Support Providers Before the *PrepWise* Intervention

Results of the two-level bivariate analyses that controlled for the clustered nature of the data (network members belonging to participants) showed the following factors associated with being identified as a support provider: family and relatives (odds ratio [OR] = 4.25; 95% confidence interval [CI] = 2.45-7.37), those with whom participants interacted over the phone or Internet at least weekly (OR = 5.74; 95% CI = 2.05-16.11), those who provided instrumental (OR = 9.60; 95% CI = 3.32-27.77) and emotional (OR = 8.81; 95% CI = 3.39-22.88) support, those with whom participants shared concerns (OR = 10.19; 95% CI = 2.30-45.07), and those whom participants trusted (OR = 7.73; 95% CI = 2.29-26.12). In the multivariable

TABLE 3

**Predictors of Emergency Support Providers at Baseline and Network Members Who Added Emergency Support at Follow-up<sup>a</sup>**

	Emergency Support Provider: Baseline (N = 194)		Members Who Added Emergency Support at Follow-up (N = 232)	
	OR	95% CI	OR	95% CI
Family/relative <sup>b</sup>	2.97 <sup>c</sup>	(1.14, 7.71)	0.23 <sup>e</sup>	(0.10, 0.54)
Talk or over Internet: once a week or more	6.10 <sup>d</sup>	(1.90, 19.58)		
Instrumental help: who helps	4.47 <sup>c</sup>	(1.18, 16.99)		
Emotional support	7.08 <sup>e</sup>	(2.81, 17.81)		
Trust: you can trust			4.74 <sup>d</sup>	(1.55, 14.50)

<sup>a</sup>Abbreviations: CI, confidence interval; OR, odds ratio. Sample size was 194 for baseline and 232 for follow-up. Both models were controlled for participant-level characteristics including age, female, and social network size.

<sup>b</sup>Reference group was not family (eg, friend, service provider, coworker).

<sup>c</sup> $P < 0.05$ . <sup>d</sup> $P < 0.01$ . <sup>e</sup> $P < 0.001$ .

model controlling for participant characteristics (age, gender, social network size), family and relatives still had almost 3 times the odds of being selected as emergency support providers compared to network members who were not family members (OR = 2.97; 95% CI = 1.14-7.71), and those with whom participants talked or interacted over the Internet at least weekly had over 6 times the odds of being selected (OR = 6.10; 95% CI = 1.90-19.58) as did those with whom participants did not interact as frequently. Providing instrumental (OR = 4.47; 95% CI = 1.18-16.99) and emotional (OR = 7.08; 95% CI = 2.81-17.81) support also remained significant (Table 3).

### Emergency Support Providers Gained After the *PrepWise* Intervention

The bivariate analyses showed that network members who respondents indicated as someone who would provide additional emergency support that was not present at baseline (added emergency support source) had a lower odds of being family or relative compared to not being family members and higher odds of being identified as someone who participants trusted than did those who were not identified as such. These factors remained significant in the multivariable model controlling for participants' age, gender, and social network size: family/relative (OR = 0.23; 95% CI = 0.10-0.54) and trust (OR = 4.74; 95% CI = 1.55-14.50).

### DISCUSSION

In this study, we evaluated the impact of a disaster and emergency preparedness education program, *PrepWise*, on changes in the personal emergency support network systems of rural older residents. Understanding the emergency support networks of older adults and enhancing such support systems are among the major public health priorities for vulnerable populations.<sup>3,4</sup> Although the importance of strong familial and community support systems for older residents in the community has been suggested,<sup>36</sup> the characteristics of

emergency personal support networks of rural older residents are largely unknown. Achieving one of the main goals of the *PrepWise* intervention, participants reported the enhancement of their personal emergency support networks 1 month after receiving the program by adding new members or identifying additional sources of emergency support among the existing network members. Further analyses revealed some characteristics of the network members and social interactions associated with someone being identified by the participants as emergency support sources.

Before receiving *PrepWise*, network members identified as someone who would provide support or assistance in emergency situations were more likely to be family or relatives as opposed to not being family members. This finding is consistent with the general social network literature regarding older adults showing the importance of family relationships.<sup>37,38</sup> Similarly, being able to interact frequently has important implications for the availability and accessibility of support sources.<sup>39,40</sup> In the current study, frequency of interaction via phone or Internet was shown to be an important predictor of being selected as a source of emergency support. Although it has been traditionally thought that face-to-face interactions are important in order to exchange instrumental support,<sup>40</sup> recent advancements in communication technology may be allowing people to exchange support from a distance, which is important even in emergency situations (eg, information provision). Alternatively, such technology-mediated communication may be allowing older adults to develop "backup" support sources for activation in case of emergency even though they may not see these network members frequently in person.<sup>41</sup>

Our results also highlight the importance of social relationship quality, showing that those who provided emotional and instrumental support had higher odds of being identified as emergency support sources compared with those who did not. It has been demonstrated that older adults value high-quality

social relationships.<sup>42</sup> Our findings further highlight the need for public health interventions to consider such relationship quality when trying to enhance older adults' emergency support systems. Notably, this study suggests that efforts to enhance the support networks of older adults cannot simply focus on adding new support providers but rather on activating support sources and interactions with existing network members who have high-quality interactions with the focal individuals. Thus, developing strategies to systematically identify such social relationships and helping these dyads (support providers and the focal individual) discuss, negotiate, and plan additional social interactions (eg, calling or supporting each other if emergency situations occurred) may be beneficial.

In assessing the impacts of the *PrepWise* intervention on the emergency support networks of the participants, we found that participants identified additional emergency support sources that were not identified prior to the intervention. Added sources of support had higher odds of not being family (eg, friends, neighbors, coworkers, service providers) or relatives. This may be because the participants identified most of their family members at baseline, thus providing little room to increase. At the same time, this could also indicate the success of the *PrepWise* program in highlighting the importance of adding those living close by, because family and relatives living farther away may not always be able to assist adequately. *PrepWise* also emphasized the importance of making emergency plans with friends and neighbors. As previous literature suggests, older adults tend to value and focus on familial social relationships.<sup>42</sup> However, when preparing for and dealing with emergency and disasters, it often becomes necessary to work with those who are available and accessible. Thus, encouraging older adults to consider emergency support sources other than family and to discuss their emergency plans with those who may be able to assist can be beneficial. This study demonstrated the feasibility of adding such network members to older adults' emergency support systems. When assisting older adults to identify additional sources of support, older adults may be encouraged to think about their current relationships that involve trust.

This was a small project involving a testing of a disaster preparedness intervention program. All participants were from one community in Iowa; however, we successfully recruited participants from various socioeconomic backgrounds, including residents from government-subsidized housing for low-income adults. Although not generalizable to other populations, our findings shed light on the characteristics of emergency support networks of rural older adults, how such support systems may be changed through interventions, and potential ways to assess changes in support systems in future studies. Although the numbers of participants were small, analyses at network member-level (dyads) could be conducted to identify relationship factors associated with identification of emergency support sources. Characteristics of network members and social interactions were

assessed from the participants' perspective and were not verified by their network members.

## CONCLUSIONS

Much of the public health efforts surrounding disaster preparedness and response have focused on the community-level support systems such as disaster response networks.<sup>13,43</sup> However, personal support networks are important for older adults in ensuring their health and well-being, especially in rural areas. This study found that the enhancement of emergency support networks may be possible through a preparedness education program specifically designed for community-based older adults. The *PrepWise* intervention appears to have influenced not only the composition of participants' social networks but also the interaction patterns (eg, additional support sources). Future studies should investigate the types of changes in emergency support networks and relationship quality that may lead to improved disaster and emergency outcomes among older adults. Older adults living in rural settings are at increased risk for social isolation compared to their urban counterparts. Strong social support networks have been associated with better health behaviors as well as better physical and mental health outcomes.<sup>44-46</sup> Therefore, it is possible that enhancing emergency support networks leads to not only improved emergency preparedness behaviors but also improved overall health and well-being among rural older residents.

## About the Authors

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## Author Contributions

S. Ashida conceptualized and designed the study, supervised data collection, analyzed data, and wrote the paper. E.L. Robinson assisted in data collection



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