BMJ Open

Is lack of social support associated with a delay in seeking medical care? A cross-sectional study of Minnesota and Tennessee residents using data from the Behavioral Risk Factor Surveillance System

Matthew W Reisinger,[1,2] Marc Moss,[3] Brendan J Clark[3]

¹Department of Hospital Medicine, Rose Medical Center, Denver, Colorado, USA
²Department of Medicine, Internal Medicine Residency Program, University of Colorado Denver, Aurora, Colorado, USA
³Department of Medicine, Division of Pulmonary Sciences and Critical Care Medicine, University of Colorado Denver, Aurora, Colorado, USA

Correspondence to
Dr Matthew W Reisinger; reisinmw@gmail.com

ABSTRACT

Objective Previous studies have demonstrated an association between social support and lower morbidity and mortality. Delay in seeking medical care is associated with poor health outcomes. The relationship between social support and delay in seeking medical care has not been established. We sought to determine whether lack of social support is associated with higher rates of delays in seeking needed medical care.

Methods This is a cross-sectional observational study using data from the 2013 and 2014 Centers for Disease Control Behavioral Risk Factor Surveillance System. Participants who were asked questions about delays in medical care and social support were included. The primary outcome was a self-reported delay in seeking needed medical care. The primary independent variable of interest was a dichotomised measure of social support. Multivariable logistic regression was performed, adjusting for demographics, socioeconomic status, comorbidities and access to care.

Results Participants without social support were more likely to report delaying needed medical care when compared with participants with social support (38%vs19%, p<0.001). The association between lack of social support and delays in care persisted after adjustment for demographics, socioeconomic status, comorbidities and access to care (OR 1.72; 95% CI 1.45 to 2.06; p<0.001).

Conclusions Lack of perceived social support is associated with patient-reported delay of needed medical care. This association may contribute to the poor health outcomes experienced by those with a lack of social support.

INTRODUCTION

Social support refers to the process of interaction in relationships that improves coping, esteem, belonging and competence through actual or perceived exchanges of financial, physical or psychosocial resources. Over the past several decades, a consistent association

Strengths and limitations of this study

► Large sample size.
► Professionally collected and validated survey data from the Centers for Disease Control.
► Sample population limited to two US states.
► Cross-sectional data; we are able to find association but unable to determine causation.
► Survey questions do not specify what type of medical care was delayed.

between social support and lower morbidity and mortality has been demonstrated.[1–6] This relationship exists across different populations and has been reported in disease-specific mortality for cardiovascular disease and cancer.[7] The effect size of this association is substantial. The most socially isolated individuals may have a mortality rate 50% higher than the most socially integrated individuals. If viewed as a clinical risk factor, social isolation is comparable with smoking.[8]

The mechanism by which social support is protective is likely multifactorial. Social relationships improve our cognitive function, lower systolic blood pressure, and enhance immune system function and gene expression.[9–14] In addition, social support impacts health-related behaviours including increased physical exercise and decreased tobacco and alcohol use.[15 16] Despite a growing understanding of potential mechanisms that may mediate the poor health outcomes observed in those without social support, the association between the lack of social support and delays in seeking medical care has previously only been studied in small samples, in specific populations such as the elderly or in disease-specific contexts such as HIV.[17–20]

The association between delays in seeking medical care and poor outcomes is well established.[21 22] Time to antibiotics for sepsis, door to balloon time for acute coronary syndrome and timing of cancer diagnosis are examples of the critical importance of prompt medical care.[23–25] Patient delay in seeking medical care is a complex process, with symptom recognition and access to care issues including lack of transportation, financial barriers and lack of a primary care provider all contributing.[26–29] Lack of social support may play an important role in delays in care, and this relationship could partially explain the protective effect of social support on health outcomes seen in previous studies. Using data from the 2013 and 2014 Behavioral Risk Factor Surveillance System (BRFSS), we sought to determine whether a self-reported lack of social support confers higher perceived rates of delays in seeking needed medical care. Understanding this relationship could identify a high-risk group where interventions targeted at addressing barriers to seeking care could lead to improved health outcomes.

METHODS
Study design, setting and participants
We conducted a cross-sectional observational study using data from the Centers for Disease Control BRFSS survey. The BRFSS survey is a nationally representative telephone survey conducted annually by the Centers for Disease Control and Prevention. A random-digit dialling algorithm targeting both landlines and cellular telephones is used to generate a nationally representative sample of adult respondents from all 50 states, the District of Columbia and several United States territories. Adults age 18 or older not living in vacation homes, group homes, institutions and households located outside of the state where the particular BRFSS questionnaire is being administered are included. For landline calls, an adult member of the household is randomly selected to complete the survey; cellular telephone respondents are treated as a single household. The survey includes a core component, which is administered to all respondents. This core component contains questions about demographics, healthcare access, substance and alcohol use, health status and socioeconomic status. There are also optional question modules that are administered at the discretion of each state. Respondents from Tennessee in 2013 and respondents from Minnesota in 2014 were asked questions about social support and delays in seeking medical care; these respondents constitute the sample for this study. This study using de-identified, publicly available data was reviewed by the Colorado Multiple Institutional Review Board and received an exemption.

Patient involvement
Survey respondents were selected as described above and were not involved in the design of this study.

Outcome variable
The primary outcome was a self-reported delay in seeking needed medical care. Two questions were combined to assess delays in seeking needed medical care. The first question asked participants, "Was there a time the past 12 months when you needed to see a doctor but could not because of cost?" The second question asked participants, "Other than cost, there are many other reasons people delay getting needed medical care. Have you delayed getting needed medical care for any of the following reasons in the last 12 months? Select the most important reason". Potential responses included cost, could not reach the office, could not get an appointment, too long of a wait in the waiting room, office was closed, lack of transportation and 'other' reason. Participants answering yes to either or both of these questions were considered to have delayed seeking medical care. Participants answering no to both questions were considered to not have delayed seeking needed care. The secondary outcome was the reason for delaying needed medical care.

Explanatory variables
Social support was defined by response to the question, "How often do you get the social and emotional support you need?" Respondents answering *always* or *usually* were categorised as having social support. Respondents answering *sometimes*, *rarely* or *never* were categorised as not having social support, as previously described.[28 29] Because there was no assessment of the actual social support received by survey participants, the response to this question is best viewed as perceived social support.

Covariates
Covariates were included based on their potential or reported association with delays in seeking medical care. Demographic data included age considered as a continuous variable, gender, race/ethnicity and marital status. Race/ethnicity was categorised as white non-Hispanic, African American, Hispanic and other. Marital status was categorised as married or other. Socioeconomic status variables included education level and employment status. Education level was categorised as non-high school graduates, high school graduates and college graduates according to the highest education level achieved. Employment status was categorised as employed, unemployed or student status, and retired. Comorbidity data included whether the participant had ever been told by a healthcare professional that they had depression, diabetes mellitus, chronic obstructive pulmonary disease, coronary artery disease and perceived general health. Perceived health was reported as a general health status of fair or poor versus excellent, very good or good. Alcohol misuse was determined by reported number of drinks per day using previously described cut-offs.[30] Variables pertaining to access to care included whether or not the participant had an established primary care physician and whether they had any health insurance coverage in the last 12 months.

Statistical analysis

Differences between participants with and without social support were evaluated using a t-test for continuous variables and a χ^2 test for proportions. To determine whether delay in seeking medical treatment was associated with the level of perceived social support, we used a forward stepwise multivariable logistic regression model adding the following groups of covariates, which were identified a priori: demographics (age, gender, race/ethnicity and marital status), socioeconomic status (education level, employment status), health factors (depression, diabetes mellitus, chronic obstructive pulmonary disease, coronary artery disease, alcohol misuse, perceived general health) and access to healthcare (health insurance coverage, established primary care physician). This approach was chosen because it would allow us to assess for confounding by clinically relevant groups of variables. Those who reported high levels of social support were used as a reference group. As previously described and recommended for this dataset, a weighting formula was applied in descriptive as well as multivariable analyses.[31] Weighting assures that data are representative of the population on several characteristics including age, sex, race, education, marital status, home ownership, phone ownership and sub-state region.[31] Our main multivariable analysis included all respondents who were asked questions about delays in care and social support, which in 2013 and 2014 included respondents from Tennessee and Minnesota. In order to explore the generalisability of our findings as only two states administered the question modules required for inclusion, we performed a sensitivity analysis examining the association between social support and delays in seeking medical treatment separately in participants enrolled in Tennessee and Minnesota. Respondents with missing variables were dropped from the multivariable analyses. A p value of <0.05 was considered significant and the primary inference for the study was made based on the fully adjusted multivariable logistic regression model.

RESULTS

A total of 22 234 participants were asked questions about social support and delays in seeking medical care, and 18 980 (weighted n=7 459 000) (85%) had complete data (figure 1). Of the 3254 with incomplete data, 2631 (81%) were missing answers to the question on social support, 14 (4%) were missing answers to questions about delays in care and 481 (15%) had missing data for both social support and delays in care (figure 1). Those with missing data were more likely to be men (53% vs 48%, p<0.001), African American (15% vs 10%, p<0.001), have no primary care physician (29% vs 22%, p<0.001) and be uninsured (14% vs 9%, p<0.001), but had similar levels of lack of perceived social support (16% vs 18%, p=0.56) (online supplementary table S1). Respondents who participated in the BRFSS in 2013 and 2014 but who were not included in this analysis because they were not asked the appropriate modules were more likely to be Hispanic (16% vs 3%, p<0.001) and more likely to delay care (34% vs 23%, p<0.001) (online supplementary table S2).

Respondents included in the analysis had an average age of 48 years and were predominately non-Hispanic whites (83%) (table 1). The majority of the population had at least a high school education (88%) and were currently employed (58%), while 18% were retired and 24% were unemployed or students. Depression was the most common comorbidity (19%), while 10% had diabetes, 7% had COPD, 5% had coronary artery disease and 15% had alcohol misuse. Nearly one quarter of respondents reported a lack of social support (23%). Participants without social support were of similar age but were more likely to be men (54% vs 46%, p<0.001), African American (17% vs 8%, p<0.001), not have a high school degree (21% vs 10%, p<0.001), to report fair or poor state of general health (35% vs 14%, p<0.001), to not have a primary care physician (28% vs 22%) and lack health insurance (17% vs 7%). Those with social support were more likely to be married (58% vs 42%, p<0.001) and employed (60% vs 50%, p<0.001) (table 1).
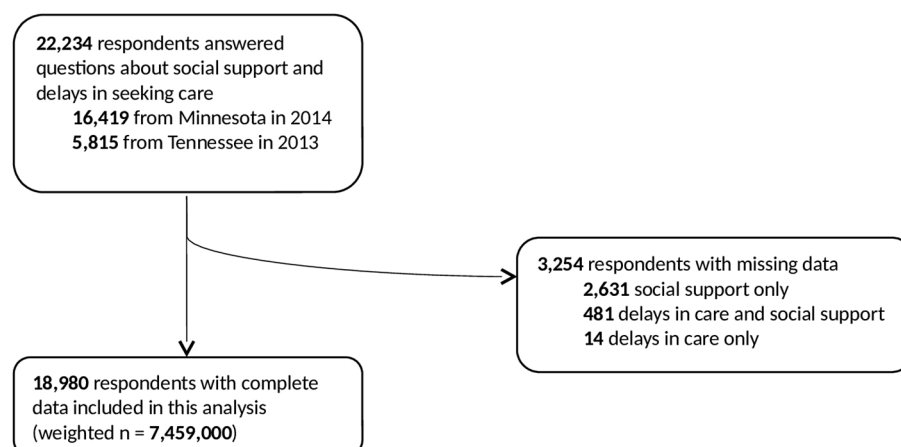
Figure 1 Selection of sample for this study.

Table 1 Baseline characteristics of respondents

	Overall (n=7459*)	With support (n=6087*)	No support (n=1372*)	P values
Age (mean, range)	48 (18–80)	48 (18–80)	48 (18–80)	
Gender (male)	3551 (48)	2811 (46)	739 (54)	<0.001
Race/ethnicity				
White non-Hispanic	6158 (83)	5168 (85)	990 (72)	<0.001
African American	717 (10)	478 (8)	239 (17)	<0.001
Hispanic	182 (2)	152 (3)	31 (2)	0.57
Other	180 (5)	127 (4)	53 (6)	0.06
Married	4102 (55)	3526 (58)	576 (42)	<0.001
Education				
Non-high school graduate	896 (12)	609 (10)	286 (21)	<0.001
High school graduate	4611 (62)	3730 (61)	881 (64)	0.06
College graduate	1943 (26)	1743 (29)	200 (15)	<0.001
Employment				
Unemployed/student	1763 (24)	1299 (21)	464 (34)	<0.001
Employed	4340 (58)	3652 (60)	688 (50)	<0.001
Retired	1334 (18)	1120 (18)	215 (16)	0.01
Comorbidity				
Depression	1430 (19)	961 (16)	470 (34)	<0.001
Diabetes	759 (10)	581 (10)	178 (13)	<0.001
COPD	507 (7)	339 (6)	168 (12)	<0.001
CAD	379 (5)	283 (5)	96 (7)	<0.001
Alcohol misuse	1120 (15)	935 (16)	185 (14)	0.11
Perceived health				
Fair/poor	1302 (18)	830 (14)	472 (35)	<0.001
Access				
No primary care physician	1641 (22)	1258 (21)	384 (28)	<0.001
Uninsured	643 (9)	418 (7)	224 (17)	<0.001
Delay				
Delay cost	995 (13)	643 (11)	352 (26)	<0.001
Delay non-cost	996 (13)	686 (11)	310 (23)	<0.001
Delay†	1673 (22)	1153 (19)	520 (38)	<0.001

*All data weighted according to Behavioral Risk Factor Surveillance System formula. Multiplication by 1000 gives weighted n. Total weighted n=7 490 000.
†Respondents reported both cost and non-cost reasons for delaying care; therefore, total number of delays is less sum of cost and non-cost delays.
CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease.

Overall, 22% of respondents reported a delay in seeking needed medical care. Participants without social support were twice as likely to report delaying needed medical care when compared with participants with social support (38% vs 19%, p<0.001). Among participants who reported a delay in seeking medical care, the most common reason was concern for the cost of care (59%), followed by unspecified reason (22%), inability to get a timely appointment (16%) and lack of transportation (10%). Those without social support were more likely to report a primary reason for delayed care due to cost (68% vs 56%, p<0.001) (figure 2). Respondents without social support were also significantly more likely to report delays because there was too long of a wait in the waiting room (8% vs 7%), they lacked transportation (11% vs 10%) or for another reason (24% vs 22%) (p<0.001 for all comparisons).

The association between a lack of social support and a delay in seeking medical care was unchanged after adjustment for demographic variables (OR 2.64; 95% CI 2.26 to 3.09) (table 2). Further adjustment for socioeconomic status (adjusted OR 2.37; 95% CI 2.01 to 2.81) and health
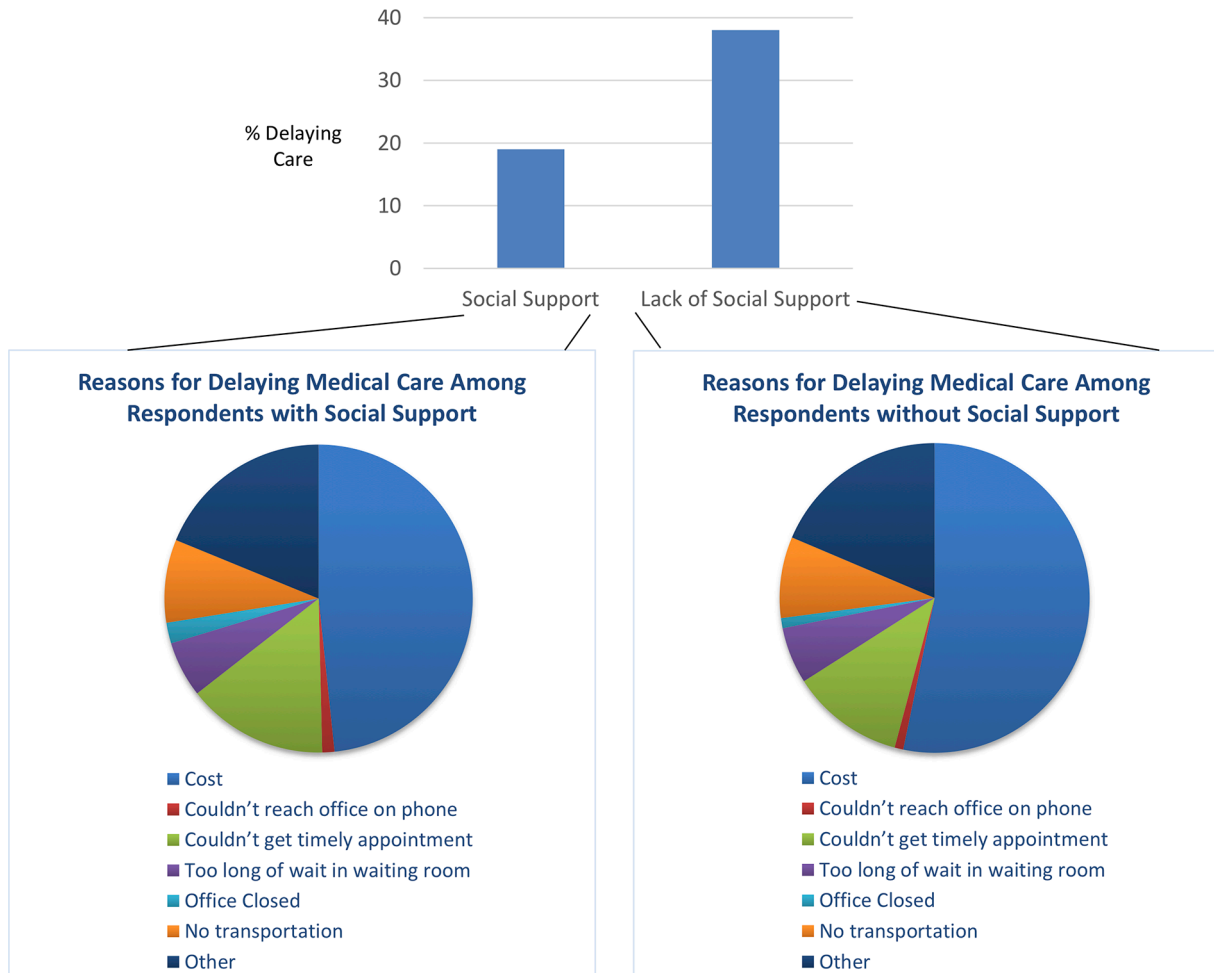
Figure 2 Reasons for delaying medical care.

factors (adjusted OR 1.88; 95% CI 1.58 to 2.23) led to an attenuation of the association between lack of social support and delays in seeking medical care. There was little change in the magnitude of the association between a lack of social support and delays in seeking care after further adjustment for access to care (fully adjusted OR 1.72; 95% CI 1.45 to 2.06).

In a sensitivity analysis examining the findings separately in Tennessee and Minnesota, a lack of social support was associated with delays in seeking medical care in respondents from both Tennessee and Minnesota (table 3; online supplementary tables S3–8). However, after full adjustment for potential confounding variables, the association between a lack of perceived social support and delay in seeking medical care was stronger in Minnesota than in Tennessee (p value for interaction term <0.001). In Minnesota, the odds of delaying medical care were 2.16 times higher (95% CI 1.83 to 2.56) in participants without social support compared with those with social support. In Tennessee, the odds of delaying medical care was 1.50 times (95% CI 1.16 to 1.94) higher in participants without social support when compared with those with social support.

DISCUSSION

This study demonstrates that a lack of social support is associated with delays in seeking medical care. The overall rate of reported delay in seeking needed medical care was 22% and respondents with a perceived lack of social support were twice as likely to report delays when compared with those with social support (38% vs 19%). While it is difficult to directly compare reported delays in care in this study with studies evaluating delays in care for specific conditions, similar rates have been previously reported.[32–34] This association persisted after adjustment for demographic variables, socioeconomic status, health factors and access to care raising the possibility that a lack of social support is independently associated with delays in seeking care.

Previous studies have demonstrated that lack of social support is an important risk factor for mortality.[1–6] This study identifies delays in seeking needed medical care as a potential mechanism by which a lack of social support may affect health outcomes. As recognition of the importance of social and behavioural determinants of health on health outcomes at the population level increases, the Institute of Medicine has encouraged identification of these factors in the clinical setting and has recommended

Table 2 Adjusted and unadjusted association between social support and delays in seeking medical care

	Model 1	Model 2	Model 3	Model 4	Model 5	95% CI	P values
Social support							
Good social support	1.00	1.00	1.00	1.00	1.00	Ref	Ref
Poor social support	2.61†	2.64†	2.37†	1.88†	1.72	1.45 to 2.06	<0.001
Demographics							
Age		1.02†	1.01†	1.01†	1.01	1.01 to 1.02	<0.001
Gender (male)		0.63†	0.67†	0.69†	0.62	0.53 to 0.72	<0.001
Race							
White non-Hispanic		1.00	1.00	1.00	1.00	Ref	Ref
African American		1.01	1.07	0.97	1.01	0.78 to 1.31	0.92
Hispanic		1.37	1.18	1.31	1.21	0.73 to 2.01	0.45
Other		1.27	1.18	1.26	1.02	0.53 to 1.98	0.95
Marital status (married)		0.76†	0.79†	0.85†	0.93	0.80 to 1.07	0.31
Socioeconomic status							
Education (highest Level)							
Non-high school graduate			1.00	1.00	1.00	Ref	Ref
High school graduate			0.61†	0.71†	0.76	0.58 to 0.99	0.046
College graduate			0.53†	0.66†	0.80	0.59 to 1.07	0.13
Employment							
Employed			1.00	1.00	1.00	Ref	Ref
Unemployed/student			1.59†	1.19†	1.11	0.94 to 1.32	0.22
Retired			0.50†	0.47†	0.50	0.40 to 0.63	<0.001
Health factors							
Comorbidity							
Depression				1.93†	1.99	1.72 to 2.31	<0.001
Diabetes mellitus				1.14	1.22	0.97 to 1.53	0.09
COPD				1.49†	1.53	1.18 to 1.97	0.001
CAD				1.00	1.01	0.74 to 1.40	0.94
Alcohol misuse				1.09	1.11	0.93 to 1.33	0.24
Perceived health							
Fair/poor				2.11†	2.14	1.75 to 2.62	<0.001
Access to care							
No primary physician					1.18	0.99 to 1.42	0.07
No insurance					4.21	3.24 to 5.48	<0.001

*95% CIs and p values refer to model 5. All other values expressed as ORs.

†Denotes p <0.05 for variables in models other than model 5.

CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease.

incorporation of standardised assessments of social isolation or connection into the electronic medical record. Identification of patients with low levels of social support may provide opportunity to target a high-risk population that could benefit from care management systems or group-based interventions to build social support and encourage prompt medical care. Specifically, patient navigators may be uniquely suited to address the needs of patients with low levels of social support. Previously described roles of patient navigators include facilitating access to and coordination of healthcare, helping patients select the best insurance plan for their health needs, and providing emotional and informational support. These roles may be particularly important in reducing unnecessary delays in care for patients with low levels of social support.[35]

There are several limitations to our study. First, Tennessee and Minnesota were the only states in the BRFSS dataset that included all of the survey questions required for inclusion in our analysis. While

Table 3 Subgroup analyses by state

	Minnesota			Tennessee		
	Fully adjusted OR	**95% CI**	**P values**	**Fully adjusted OR**	**95% C I**	**P values**
Social support						
Good social support	1.00	Ref	Ref	1.00	Ref	Ref
Poor social support	2.16	1.83 to 2.56	<0.001	1.50	1.16 to 1.94	<0.01
Demographics						
Age	1.01	1.01 to 1.02	<0.001	1.01	1.00 to 1.02	0.04
Gender (male)	0.66	0.58 to 0.75	<0.001	0.60	0.47 to 0.76	<0.001
Race						
White non-Hispanic	1.00	Ref	Ref	1.00	Ref	Ref
African American	0.58	0.42 to 0.80	<0.001	1.22	0.88 to 1.70	0.22
Hispanic	1.44	1.00 to 2.06	0.05	1.06	0.26 to 4.35	0.94
Other	1.08	0.56 to 1.68	0.73	0.93	0.48 to 1.80	0.84
Marital status (married)	0.88	0.77 to 0.99	0.04	0.95	0.76 to 1.20	0.68
Socioeconomic status						
Education (highest level)						
Non-high school graduate	1.00	Ref	Ref	1.00	Ref	Ref
High school graduate	0.98	0.71 to 1.35	0.90	0.71	0.49 to 1.03	0.07
College graduate	0.97	0.71 to 1.35	0.83	0.81	0.52 to 1.25	0.34
Employment						
Employed	1.00	Ref	Ref	1.00	Ref	Ref
Unemployed/student	1.09	0.92 to 1.29	0.33	1.08	0.83 to 1.41	0.57
Retired	0.58	0.48 to 0.71	<0.001	0.45	0.31 to 0.64	<0.001
Health factors						
Comorbidity						
Depression	2.02	1.75 to 2.32	<0.001	2.00	1.56 to 2.56	<0.001
Diabetes mellitus	1.07	0.86 to 1.33	0.56	1.29	0.93 to 1.78	0.12
COPD	1.70	1.35 to 2.15	<0.001	1.44	1.01 to 2.06	0.04
CAD	0.88	0.65 to 1.20	0.42	1.08	0.70 to 1.65	0.73
Alcohol misuse	1.14	0.98 to 1.33	0.10	1.19	0.82 to 1.72	0.36
Perceived health						
Fair/poor	2.21	1.85 to 2.64	<0.001	2.04	1.51 to 2.75	<0.001
Access to care						
No primary physician	1.10	0.93 to 1.29	0.27	1.28	0.95 to 1.74	0.11
No insurance	1.75	0.41 to 7.53	0.45	3.90	2.88 to 5.28	<0.001

CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease.

these two states differ in racial composition compared with the national population, the analysis presented in online table S2 demonstrated that they are nationally representative in terms of socioeconomic status, rates of comorbidities and access to care. One exception is that the state of Minnesota had a very small uninsured population. While Minnesota does have one of the lowest rates of uninsured status in the USA, the extremely low rate (<1%) found in this study may represent a bias in the survey. Although our findings were consistent in both states, the magnitude of the association varied highlighting that these results should be generalised to the rest of the USA with caution.

Second, there may be a selection bias wherein those with low levels of social support may be less likely to participate in the survey. Therefore, the rates of poor social support may be underestimated. Third, our primary outcome of delay in needed medical care is patient reported and we were unable to determine what type of care was delayed. It is plausible that the likelihood of delay in seeking care or the reasons for seeking care vary by illness, symptom and/or severity.

Our outcome variable lacked sufficient specificity to explore this hypothesis. Fourth, assessment of the reason for care delay was determined by response to two separate questions, one of which solely addressed cost. While this inherently biases the responses towards reporting cost as a reason for care delay, other studies support that concern for cost of care is a common reason for care delay.[32] Fifth, although we incorporated several demographic variables and measures of socioeconomic status, health factors and access to care, it is possible that these results are explained by residual or unmeasured confounding. Examples may include personality factors or unmeasured mental health conditions.

Additionally, because this is a cross-sectional study, we are unable to establish a temporal relationship between lack of social support and treatment delays, and thus the ability to infer causality is limited. Finally, this study likely underestimates the rates of delays in care. Respondents in this study were asked about delaying *needed* medical care and therefore care delay due to symptom appraisal, the process by which a patient recognises that their condition requires medical attention, is not accounted for. While this may lead to an underestimation of care delay, delays due to symptom appraisal would likely be targeted by different types of interventions, such as education about the symptoms of specific conditions. Common examples of these types of interventions include educational campaigns about the symptoms of stroke or breast cancer. By eliminating symptom appraisal as a cause of care delay, this study likely better identifies care delays that may be modifiable by interventions targeting a lack of social support.

In conclusion, lack of perceived social support is associated with patient-reported delay of needed medical care in a sample of residents from two states in the USA. Identification of patients with low levels of social support could help identify a high-risk population that may benefit from interventions targeted at reducing social isolation and improving access to care.

REFERENCES

1. Berkman LF, networks S. support, and health: taking the next step forward. *Am J Epidemiol* 1986;123:559–62.
2. Blazer DG. Social support and mortality in an elderly community population. *Am J Epidemiol* 1982;115:684–94.
3. Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: a meta-analytic review. *PLoS Med* 2010;7:e1000316.
4. House JS, Landis KR, Umberson D. Social relationships and health. *Science* 1988;241:540–5.
5. Lyyra TM, Heikkinen RL. Perceived social support and mortality in older people. *J Gerontol B Psychol Sci Soc Sci* 2006;61:S147–52.
6. Zhang X, Norris SL, Gregg EW, et al. Social support and mortality among older persons with diabetes. *Diabetes Educ* 2007;33:273–81.
7. Berkman LF, Melchior M, Chastang JF, et al. Social integration and mortality: a prospective study of French employees of Electricity of France-Gas of France: the GAZEL Cohort. *Am J Epidemiol* 2004;159:167–74.
8. Pantell M, Rehkopf D, Jutte D, et al. Social isolation: a predictor of mortality comparable to traditional clinical risk factors. *Am J Public Health* 2013;103:2056–62.
9. Cole SW, Hawkley LC, Arevalo JM, et al. Social regulation of gene expression in human leukocytes. *Genome Biol* 2007;8:R189.
10. Holt-Lunstad J, Uchino BN, Smith TW, et al. Social relationships and ambulatory blood pressure: structural and qualitative predictors of cardiovascular function during everyday social interactions. *Health Psychol* 2003;22:388–97.
11. Lamkin DM, Lutgendorf SK, McGinn S, et al. Positive psychosocial factors and NKT cells in ovarian cancer patients. *Brain Behav Immun* 2008;22:65–73.
12. Miyazaki T, Ishikawa T, Nakata A, et al. Association between perceived social support and Th1 dominance. *Biol Psychol* 2005;70:30–7.
13. Seeman TE, Lusignolo TM, Albert M, et al. Social relationships, social support, and patterns of cognitive aging in healthy, high-functioning older adults: MacArthur studies of successful aging. *Health Psychol* 2001;20:243–55.
14. Yang YC, Boen C, Mullan Harris K. Social relationships and hypertension in late life: evidence from a nationally representative longitudinal study of older adults. *J Aging Health* 2015;27:403–31.
15. Oka RK, King AC, Young DR. Sources of social support as predictors of exercise adherence in women and men ages 50 to 65 years. *Womens Health* 1995;1:161–75.
16. Steptoe A, Wardle J, Pollard TM, et al. Stress, social support and health-related behavior: a study of smoking, alcohol consumption and physical exercise. *J Psychosom Res* 1996;41:171–80.
17. Berkanovic E, Telesky C, Reeder S. Structural and social psychological factors in the decision to seek medical care for symptoms. *Med Care* 1981;19:693–709.
18. Henning-Smith CE, Gonzales G, Shippee TP. Barriers to timely medical care for older adults by disability status and household composition. *J Disabil Policy Stu* 2016;27:116–27.
19. McCoy SI, Strauss RP, MacDonald PD, et al. Social support and delays seeking care after HIV diagnosis, North Carolina, 2000–2006. *AIDS Care* 2009;21:1148–56.
20. Pedersen AF, Olesen F, Hansen RP, et al. Social support, gender and patient delay. *Br J Cancer* 2011;104:1249–55.
21. Garbuz DS, Xu M, Duncan CP, et al. Delays worsen quality of life outcome of primary total hip arthroplasty. *Clin Orthop Relat Res* 2006;447:79–84.
22. Yan J, Liu Y, Zhou B, et al. Pre-hospital delay in patients with diabetic foot problems: influencing factors and subsequent quality of care. *Diabet Med* 2014;31:624–9.
23. Ferrer R, Martin-Loeches I, Phillips G, et al. Empiric antibiotic treatment reduces mortality in severe sepsis and septic shock from the first hour: results from a guideline-based performance improvement program. *Crit Care Med* 2014;42:1749–55.
24. Martin S, Ulrich C, Munsell M, et al. Delays in cancer diagnosis in underinsured young adults and older adolescents. *Oncologist* 2007;12:816–24.
25. McNamara RL, Wang Y, Herrin J, et al. Effect of door-to-balloon time on mortality in patients with ST-segment elevation myocardial infarction. *J Am Coll Cardiol* 2006;47:2180–6.
26. Dracup K, Moser DK. Beyond sociodemographics: factors influencing the decision to seek treatment for symptoms of acute myocardial infarction. *Heart Lung* 1997;26:253–62.
27. Esteva M, Leiva A, Ramos M, et al. Factors related with symptom duration until diagnosis and treatment of symptomatic colorectal cancer. *BMC Cancer* 2013;13:87.
28. MacLeod KE, Ragland DR, Prohaska TR, et al. Missed or delayed medical care appointments by older users of nonemergency medical transportation. *Gerontologist* 2015;55:1026–37.

29. Raczynski JM, Finnegan JR, Zapka JG, *et al*. REACT theory-based intervention to reduce treatment-seeking delay for acute myocardial infarction. Rapid Early Action for Coronary Treatment. *Am J Prev Med* 1999;16:325–34.
30. Woerle S, Roeber J, Landen MG. Prevalence of alcohol dependence among excessive drinkers in New Mexico. *Alcohol Clin Exp Res* 2007;31:293–8.
31. CDC. *The BRFSS Data User Guide*, 2013.
32. Kullgren JT, McLaughlin CG, Mitra N, *et al*. Nonfinancial barriers and access to care for U.S. adults. *Health Serv Res* 2012;47(1 Pt 2):462–85.
33. Sabatino SA, Coates RJ, Uhler RJ, *et al*. Health insurance coverage and cost barriers to needed medical care among U.S. adult cancer survivors age <65 years. *Cancer* 2006;106:2466–75.
34. Weissman JS, Stern R, Fielding SL, *et al*. Delayed access to health care: risk factors, reasons, and consequences. *Ann Intern Med* 1991;114:325–31.
35. Natale-Pereira A, Enard KR, Nevarez L, *et al*. The role of patient navigators in eliminating health disparities. *Cancer* 2011;117(15 Suppl):3543–52.