Association Between Fear of Crime and Mental Health and Physical Functioning

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Objectives. Studies have reported an inverse association between fear of crime and subjective mental and physical health. We investigated the direction of causality and the curtailment of physical and social activities as a possible mediating pathway.

Methods. We analyzed data from 2002 to 2004 of the Whitehall II study, a longitudinal study of more than 10 000 London-based civil servants aged 35 to 55 years at baseline.

Results. Fear of crime was associated with poorer mental health, reduced physical functioning on objective and subjective indicators, and lower quality of life. Participants reporting greater fear were 1.93 (95% confidence interval [CI] = 1.55, 2.41) times as likely to have depression as those reporting lower fear of crime and had lower mental health scores (0.9 points on the Medical Outcomes Survey Short Form 36; 95% CI = 0.4, 1.3). They exercised less, saw friends less often, and participated in fewer social activities compared with the less fearful participants. Curtailed physical and social activities helped explain the link between fear of crime and health.

Conclusions. Fear of crime may be a barrier to participation in health-promoting physical and social activities. Public health practitioners should support fear-reduction initiatives. (*Am J Public Health.* 2007;97:2076–2081. doi:10.2105/AJPH.2006.097154)

Irrespective of recorded crime levels, public perception is that crime is on the increase,[1,2] and halting crime has been the public's priority for government spending for several years.[3] Studies report an inverse association between fear of crime and subjective measures of physical, general, and mental health.[4–6] The direction of causality and linking pathways remain unclear. Although fear of crime could lead to poorer health, it is equally plausible that physical health limitations and poor mental health could increase a person's sense of vulnerability and fear of the effect of crime.[7] Longitudinal studies that control for the effect of physical or mental frailty on fear are needed to assess whether fear of crime contributes to the development of ill health.

What links fear of crime to health? One behavioral response to fear of crime is avoidance: those who are worried may restrict how much they leave the home and which places they visit, reducing the number of opportunities to form social ties and participate in social activities.[6,8–10] Fear of crime may also result in mistrust of others, in turn limiting the ability to form social ties.[9,11] Social ties and social activities appear to be protective for physical and mental health and functioning.[12–14]

Fear of crime may also lead to restrictions in outdoor activities, including walking and cycling,[15] and to increased car use.[16] Those who fear crime may therefore be less physically active, a lifestyle that increases the risk of cardiovascular disease, poor mental health, and poorer physical and cognitive functioning.[17,18] Fear of crime may have direct effects on psychological well-being.[19] Finally, fear of crime may be a stressor that has direct physiological and behavioral consequences for health. It has been proposed that perceived or actual threat increases the vulnerability to pathogens[20]; stimulates repeated physiological responses, producing wear and tear on the nervous and immune systems[4,21]; and increases the likelihood of heavy drinking.[22] However, few studies have examined the evidence for the pathways linking fear of crime to health status.

Our analysis of data from the Whitehall II study built on existing literature in the following ways: (1) we examined fear of crime and objective health measures as well as subjective ones, (2) we exploited longitudinal data to allow for the possible influence of frailty on subsequent fear of crime, and (3) we explored restrictions in social and physical activities as possible mediating pathways between fear of crime and health status.

METHODS

Participants and Measures

Data came from the sixth and seventh phases of the longitudinal Whitehall II study of British civil servants.[23] All nonindustrial civil servants aged 35 to 55 years working in the London offices of 20 government departments were invited to participate, and 10 308 persons took part at baseline (1985–1988). The response rate was 73%, although the actual rate was probably higher because 4% of those on the employee list had moved before the study began and thus were not eligible for inclusion.

The phase 6 questionnaire provided information on prior mental health and physical functioning (7537 respondents). Questionnaires were mailed to participants for self-completion. At phase 7 (2002–2004), 6944 participants aged 50 to 75 years completed a questionnaire covering sociodemographic characteristics, health status, and fear of crime, and 6336 of these also attended a screening clinic, where trained nurses collected data on physical functioning, anthropometric data, and blood samples.

Participants were asked how worried they were about the following events in their neighborhood: home being broken into, being mugged or robbed, car being stolen or things being stolen from the car, or being raped. Possible responses to each item were very worried (score 3), fairly worried (2), not very worried (1), or not worried at all (0). These responses were summed to create a fear scale ranging from 0 to 12 (Cronbach's $\alpha = 0.77$).

The 30-item General Health Questionnaire[24] captured common mental disorders and included anxiety and depression subscales (Cronbach's α=0.88 and 0.86, respectively).[25] Participants scoring 5 or more out of a total of 30 were classed as having a common mental disorder. Cut-off points of 5 out of 15 and 4 out of 12 were used to identify anxiety and depression cases, respectively.

Physical health functioning was measured by the Medical Outcomes Survey Short Form 36 (SF-36) Physical Component Summary (PCS).[26] Per standard practice, data from the SF-36 PCS were normalized to the US general population. Lower scores represent greater functional limitation. Two objective measures of physical functioning were taken at the screening clinic: walking speed and lung function.[27] The time participants took to walk 2.4 m from standing was measured 3 times and averaged. Forced expiratory volume (in liters) was also measured 3 times and averaged.

Quality of life was measured with the CASP-19,[28] which is comprised of 4 domains (control, autonomy, self-realization [i.e., life satisfaction and fulfillment of self], and pleasure) that also form an overall scale. It was derived from a needs satisfaction model for early old age (65–75 years).

Participants reported on their frequency of contact with friends and with family outside the household. They were also asked about frequency of involvement in 13 activities: gardening, practical activities (e,g., pottery, drawing), leisure use of a home computer, household tasks (e.g., home maintenance, decorating), holding office in organizations, religious activities, voluntary work, going to pubs and social clubs, visiting friends and relatives, social games (e.g., cards), cultural visits, individual occupations (e.g., reading and listening to music).

Physical activity was measured by 2 items: time spent walking outside the home or workplace and number of occasions per week engaged in vigorous physical activity.

Current or most recent civil service employment grade was hierarchically ranked from high to low and used as an indicator of socioeconomic position. Years at current address was approximated because postal code data were available at discrete time points coinciding with participant screening (1992, 1998, and 2003).

Analytic Methods

Continuous variables were split into tertiles (3 groups of equal numbers of participants) for presentation. We used linear regression to assess the association between fear of crime and SF-36 scores, walking speed, lung function, and CASP-19 quality of life (1 model for each health outcome). We used logistic regression to assess the association between fear of crime and common mental disorders. Because frailty might lead to an increase in fear of crime and might also predict future health, we adjusted models for previous mental health and physical functioning. The models then were used to estimate the relationship between current health and fear of crime among persons with comparable health status at the previous phase. We included length of time at current address as a main effect and as an interaction effect with fear of crime, because longer residence might indicate greater exposure to fear of crime.

To assess the contribution of social and physical activities to the fear of crime–health relationship, we compared nested models. Social and physical activities were omitted in the simple model. In the first enhanced model, we included social activities (contact with friends and participation in 13 social activities) as explanatory variables. In the second enhanced model, we tested participation in vigorous activity. If b_1 and b_2 estimate the association between fear of crime and health in the simple and first enhanced models, respectively, then $[(b_1-b_2)\times 100\%]\div b_1$ is the percentage of the fear of crime–health association explained by social activities. We performed tests for significant mediation.[29]

RESULTS

Mean fear of crime was 2.63 (SD=1.72) among men and 3.75 (SD=2.28) among women. This indicates generally low levels of fear, although it is consistent with being very worried about 1 item. Gender differences were especially large for worry about being mugged or robbed and being raped (Table 1). People in lower employment grades were more fearful of crime, especially burglary and mugging, than those in high employment grades.

After we adjusted for age, gender, employment grade, length of residence, and previous mental health status, the odds of a participant having a total General Health Questionnaire score above the threshold for common mental disorders increased with increased fear of crime (Table 2). The adjusted odds ratio (AOR) of common mental disorders for participants reporting fear of crime in the highest compared with the lowest tertile was 1.56 (95% confidence interval [CI]=1.32, 1.85). Fear of crime was associated with the anxiety and depression subscales. The AOR for depression was 1.93 (95% CI=1.55, 2.41) for participants with high compared with low fear. Although women had higher levels of fear of crime, there was no interaction between gender and fear of crime; the direction and magnitude of the association between common mental disorder and fear of crime was the same for men and women. There was no evidence of an interaction between length of residence at current address and fear of crime.

Fear of crime was associated with reduced physical functioning on 2 indicators—the SF-36 PCS and walking speed—and with quality of life (Table 2). A borderline association between fear of crime and lung function was also apparent. The SF-36 PCS was 0.9 points lower for those with the highest compared with the lowest fear of crime. A difference of this magnitude is comparable to a 9-year difference in age. For CASP-19, the difference between participants with high and low fear was comparable to the difference between people with and without limiting long-standing illness.[30]

Fear of crime was lowest among those who saw friends regularly and took part in more social activities (Table 3). Fear of crime was higher among those who had high contact with relatives compared with those with low contact, possibly indicating support required from family members for health or other reasons. Fear was lower among those who took part in vigorous physical activity but was not significantly associated with time spent walking outside. The associations were similar after adjustment for previous social and physical activity, providing some support for the notion that fear of crime was associated with changes in social and physical activities (data not shown).

TABLE 1—Fear of Crime, by Demographic Characteristics and Health Status, Among Civil Servants Aged 50–75 Years: Whitehall II Study, London, England, 2002–2004

	Participants, No.	Fear of Crime Score,[a] Mean	*P*	Very or Fairly Worried About Burglary, %	Very or Fairly Worried About Car Crime, %	Very or Fairly Worried About Mugging, %	Very or About Fairly Worried Rape, %
Demographic characteristics							
Men	4782	2.63	<.001	18	13	9	0.4
Women	1995	3.75		27	17	26	12
Age, y							
50–54	1230	2.89	<.05	19	12	11	2
55–59	2014	2.89		20	14	12	3
60–64	1439	2.96		20	15	14	3
65–69	1419	3.12		23	16	17	6
70–74	673	3.00		21	14	17	5
Employment grade			<.001				
High	3083	2.64		16	11	7	0.8
Medium	2933	3.06		22	16	16	3
Low	729	3.91		32	21	35	17
Health status							
General Health Questionnaire, 30 items, score			<.001				
≥5 (common mental disorder)	1370	3.46					
0–4 (no disorder)	5339	2.83					
Physical Component Score, tertile			<.001				
Lowest	2188	3.36					
Middle	2203	2.89					
Highest	2201	2.60					
Walking speed, tertile			<.001				
Lowest	2097	3.32					
Middle	2101	2.92					
Highest	2049	2.68					
Lung function, tertile			<.001				
Lowest	1574	3.58					
Middle	1590	2.79					
Highest	1598	2.57					
Quality of life (CASP-19 score), tertile			<.001				
Lowest	2175	3.50					
Middle	2243	2.96					
Highest	2288	2.44					

Note. CASP = control, autonomy, self-realization, and pleasure. See "Methods" section for details on health status measures.
[a]Participants were asked how worried they were about the following events in their neighborhood: home being broken into, being mugged or robbed, car being stolen or things being stolen from the car, being raped. Possible responses to each item were very worried (score 3), fairly worried (2), not very worried (1), or not worried at all (0), and these were summed to create a fear scale ranging from 0 to 12.

The nested regression models showed that participation in social activities explained 25% of the association between fear of crime and walking speed ($P<.001$) and 16% of the association between fear of crime and lung function ($P=.002$; Table 4). Physical activity explained 20% of the association between fear of crime and lung function ($P<.001$) but not other health outcomes.

DISCUSSION

Fear of crime is associated with poorer mental health and greater limitations in physical functioning. Participants reporting high levels of fear (i.e., those in the top tertile) were 50% more likely to exhibit symptoms of common mental disorder and more than 90% more likely to exhibit symptoms of depression than were those with the lowest levels. Participants in the top tertile had limitations in physical functioning (captured by the SF-36 PCS) that were commensurate with that of people 9 years apart in age.

It would be unreasonable to claim that this observational study demonstrated a causal relationship between fear of crime and mental health and physical functioning. However, we adjusted for previous mental health and health functioning, and thus it is reasonable to conclude that the experience of poor health leading to increased fear was not the only driver of the associations seen here. Furthermore, objective measures of physical functioning, captured by walking speed and lung function, as well as subjective measures of health were associated with fear of crime. The study therefore demonstrated that affect or reporting style (the tendency to report generally positively or negatively according to mood) did not explain the fear-of-crime–health relationship.

Another original finding was that participation in vigorous physical activities, contact with friends, and involvement in a variety of social activities were lower among those with greater fear of crime, supporting the hypothesis that curtailment of physical and social activities is one pathway linking fear of crime to mental and physical health. On the other hand, much of the fear of crime–health relationship was not mediated by these activities. This is attributable in part to an inevitable degree of measurement error, but other mediating pathways should be explored.

Limitations

Some limitations should be acknowledged. Data on actual crime victimization were not available, so it was not possible to explore the possibility that the experience of crime (rather than fear of it) is important for health. The correlation between actual victimization and fear

TABLE 2—Association Between Fear of Crime and Mental Health, Physical Functioning, and Quality of Life Among Civil Servants Aged 50–75 Years: Whitehall II Study, London, England, 2002–2004

	Overall Common Mental Disorder, OR (95% CI)	Anxiety Subscale, Case OR (95% CI)	Depression Subscale, Case OR (95% CI)	SF-36 Physical Component Score, Mean (SE)	Walking Speed, m/sec, Mean (SE)	Lung Function Forced Expiratory Volume, L, Mean (SE)	CASP-19 Quality of Life, Mean (SE)
Fear of crime, tertile							
Lowest	1	1	1	49.3 (0.1)	1.23 (0.005)	2.79 (0.02)	50.3 (0.1)
Middle	1.13 (0.94, 1.36)	1.13 (0.95, 1.34)	1.23 (0.96, 1.58)	48.8 (0.2)	1.22 (0.006)	2.77 (0.02)	49.1 (0.2)
High	1.56 (1.32, 1.85)***	1.75 (1.49, 2.04)***	1.93 (1.55, 2.41)***	48.4 (0.2)***	1.21 (0.006)**	2.75 (0.02)*	48.2 (0.2)***
Time living at current address, y							
2.5	1	1	1	48.5 (0.2)	1.22 (0.006)	2.78 (0.02)	49.3 (0.2)
5	1.03 (0.83, 1.26)	1.01 (0.83, 1.23)	1.33 (1.02, 1.74)	49.1 (0.2)	1.21 (0.008)	2.81 (0.02)	48.7 (0.2)
11	0.91 (0.77, 1.07)	0.94 (0.81, 1.10)	1.04 (0.84, 1.29)	48.9 (0.1)	1.22 (0.004)	1.75 (0.01)	49.2 (0.1)
Gender	1.05 (0.89, 1.23)	1.15 (0.98, 1.34)	0.82 (0.66, 1.01)	−1.0 (0.2)	−0.08 (0.008)	−0.95 (0.02)	1.6 (0.2)
Age (per 1 y increase)	0.97 (0.96, 0.98)	0.98 (0.97, 0.99)	0.98 (0.97, 1.00)	−0.1 (0.001)	−0.008 (0.001)	−0.04 (0.001)	0.04 (0.01)
Employment grade							
High	1	1	1	0	0	0	0
Medium	1.22 (1.05, 1.42)	1.07 (0.93, 1.23)	1.12 (0.92, 1.37)	−0.7 (0.2)	−0.06 (0.007)	−0.16 (0.02)	−1.3 (0.2)
Low	1.15 (0.89, 1.48)	1.12 (0.89, 1.42)	1.33 (0.97, 1.81)	−0.9 (0.3)	−0.14 (0.1)	−0.31 (0.04)	−1.5 (0.3)
Previous poor mental health case[a]	6.62 (5.73, 7.64)	9.01 (7.90, 10.28)	14.25 (11.76, 17.28)				
Previous SF-36 physical component score				0.6 (0.01)	0.006 (0.0004)	0.006 (0.001)	0.3 (0.01)
Previous SF-36 mental component score							0.4 (0.01)

Note. OR = odds ratio; CI = confidence interval; SF = Medical Outcomes Survey Short Form 36; CASP = control, autonomy, self-realization, and pleasure. Model estimates for each outcome were mutually adjusted for age, gender, employment grade, length of residence, and previous mental health status. See "Methods" section for details on measures and scores.
[a]Previous overall common mental disorder for column 1; previous anxiety case for column 2; previous depression case for column 3.
*P = .10; **P = .05; ***P = .001.

is weak, and rates of actual victimization are much lower than the prevalence of fear of crime,[1,31] although the evidence is not extensive.

Fear of crime was measured concurrently with social activities and health. This limited the opportunity to explore the temporal sequence linking fear of crime to changes in behavior, such as curtailment of social activities, and health. Assuming the relationship between fear of crime and health is a causal one, it seems reasonable to assert that fear of crime has a fairly immediate effect on social activity and mental health. The lag time for physical functioning may plausibly be a little longer. Adjustment was made for previous health status, so estimates were independent of the effect of previous health on subsequent activity.

The use of surveys to measure fear of crime has limitations, because many attitudes toward crime and wider social trends can be captured by items purporting to capture fear of crime.[32] The items used here did not identify the frequency or intensity of people's fear or the risk of becoming a victim.[33,34] It is important to understand these details if interventions to tackle the fear of crime are to be developed. Nevertheless, the results showed that this general measure was associated with declines in people's mental health, physical functioning, and quality of life. Irrespective of whether those effects were generated by a high intensity of fear or a high frequency of occasions on which people felt fearful, greater fear was associated with poorer health.

One quarter of women were very or fairly worried about being mugged or robbed. Twenty percent of men and women were very or fairly worried about burglary, and a small percentage less were worried about car crime. Recent work suggests that the self-reported measures employed in the British Crime Survey, on which the Whitehall II measures were based, may have overestimated levels of fear generally but underestimated men's fear of crime.[35,36] Even if absolute levels of fear were overestimated here, our study showed that the one third of participants with the greatest levels of fear had significantly poorer health and functioning compared to the participants in the lower 2 tertiles. Even low levels of fear may affect people's health and health-related behaviors.

Individual and Contextual Determinants of Fear of Crime

Research has identified individual influences (age, gender, physical frailty, car ownership, and living alone[37,38]) on reported fear of crime. Individual factors are related to the vulnerability hypothesis, whereby individuals

TABLE 3—Relationship Between Fear of Crime and Social and Physical Activities Among Civil Servants Aged 50–75 Years: Whitehall II Study, London, England, 2002–2004

	Mean Fear of Crime,[a] No.	*P*
Visit relatives		<.05
Never	2.84 (1754)	
Sometimes	2.98 (4124)	
Often	3.04 (673)	
Visit friends		<.001
Never	3.10 (540)	
Sometimes	2.92 (3600)	
Often	2.78 (2567)	
Participation in social activities, tertile		<.001
Lowest	3.21 (2371)	
Middle	2.85 (2005)	
Highest	2.80 (2341)	
Time spent walking outside, tertile		>.1
Lowest	3.05 (2033)	
Middle	2.92 (2377)	
Highest	2.91 (2203)	
Participation in vigorous activity, weekly		<.001
None	3.00 (3402)	
1–2 occasions	2.91 (1541)	
≥3 occasions	2.80 (1353)	

Note. See "Methods" section for details on social and physical activity measures.
[a]Participants were asked how worried they were about the following events in their neighborhood: home being broken into, being mugged or robbed, car being stolen or things being stolen from the car, being raped. Possible responses to each item were very worried (score 3), fairly worried (2), not very worried (1), or not worried at all (0), and these were summed to create a fear scale ranging from 0 to 12.

TABLE 4—Social and Physical Activities as Mediators of the Fear of Crime–Health Relationship Among Civil Servants Aged 50–75 Years: Whitehall II Study, London, England, 2002–2004

	Fear-of-Crime Estimate for Simple Model[a]	Fear-of-Crime Estimate for Model Including Social Activities,[b] Change From Simple Model, %	Test for Significant Mediation Effect of Social Activities, t (*P*)	Fear-of-Crime Estimate for Model Including Physical Activities,[c] Change From Simple Model, %	Test for Significant Mediation Effect of Physical Activities, t (*P*)[d]
General Health Questionnaire	–0.1102	0.1022 (7%)	0.3 (>.1)	0.1178	NA[d]
Physical Component Score	–0.204	–0.202 (1%)	0.6 (>.1)	–0.218	NA[d]
Walking speed	–0.0044	–0.0033 (25%)	5.5 (<.001)	–0.0043 (2%)	0.3 (>.1)
Lung function	–0.0091	–0.0076 (16%)	3.0 (<.01)	–0.0073 (20%)	3.6 (<.001)
CASP-19	–0.520	–0.501 (4%)	1.9 (>.1)	–0.545	NA[d]

Note. CASP = control, autonomy, self-realization, and pleasure. See "Methods" section for details on measures.
[a]Includes gender, age, employment grade, length of residence at current address, and health status at previous phase of study.
[b]Simple model plus contact with friends plus participation in 13 social activities.
[c]Simple model plus vigorous activity.
[d]Association between fear of crime and health magnified.

who see themselves as vulnerable are more likely to fear crime.[39] Fear of crime has been given more prominence as a research topic for older people. The findings from this study of healthy civil servants aged 50 to 75 years indicate that fear of crime can have implications for the general population. It is significant that greater fear was reported by those in lower employment pay grades. This highlights the additional burden of fear experienced by those with fewer socioeconomic resources and suggests that fear of crime may contribute to socioeconomic inequalities in health and functioning. Initiatives to reduce the fear of crime should be directed to all ages and especially to the more disadvantaged.

Contextual influences, including physical and social aspects of neighborhoods such as social disorder, deprivation, overcrowding, vandalism, and vacant housing, are also related to fear of crime.[4,40–42] These physical and social cues may signal to residents a greater risk of crime, thereby increasing fear (the incivilities hypothesis).[38] However, neighborhood hazards covary, so a neighborhood characterized by social and physical disorder may also lack green spaces, good street lighting, and other aspects of urban design as well as high-quality health care facilities, which may directly affect mental and physical health. The possibility that fear of crime is confounded by these unmeasured features of the neighborhood cannot be excluded. Inclusion of these neighborhood features in analytic models was beyond the scope of the data available in the present study, although the relationship of various social, physical, and service characteristics of the neighborhood to fear of crime is empirically testable.

One neighborhood feature that shows a surprisingly weak relationship to fear of crime is actual (recorded) crime rate.[42] Although this association may be weakened by an underreporting of criminal events, there is evidence that the effect of an event on fear of crime is amplified if knowledge of that event arises through a local social contact[43] or if signs of physical and social disorder are also present in the neighborhood.[42] Cognitive habituation to high levels of crime may also explain the relatively weak correlation.[42] These findings suggest that reduction of actual crime rates may not be sufficient to reduce the fear of crime (and its subsequent effect on health).

Initiatives addressing visible cues and the public response to those cues are also needed (although not as a substitute for actual crime reduction[44]). Environmental design, including clear sight lines, good street lighting, and mixed land use, is being used to reduce opportunities for crime and fear of crime.[45,46] Police and government can provide information on the true (rather than perceived) risk and crime rate, can educate about self-protection, and can involve communities in crime prevention (such as existing Block Watch and Neighborhood Watch programs), which may be effective in reducing opportunity for criminal activity and residents' sense of vulnerability through shared community action.

Americans and Europeans alike are fascinated by crime, a testament to which is its extensive media coverage. Crime and disorder are primary concerns for the general public. Our findings show that fear of crime is not merely an affective response; it is associated

with impaired physical and mental health functioning. Public health practitioners should recognize that fear of crime may be a barrier to participation in health-promoting physical and social activities. Initiatives to reduce the fear of crime may encourage greater participation in physical and social activities and improve a nation's health. ■

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Contributors

M. Stafford originated the study, analyzed the data, wrote the article, and completed the revisions. T. Chandola and M. Marmot helped originate the study, write the article, and contributed to the revisions.

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Human Participant Protection

Each phase of the Whitehall II study received ethical approval from the research ethics committee of University College London Hospitals.

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