Prevalence of Major Life Events Among Patients and Community Dwellers

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Abstract *Background:* Life events have been shown to be associated with health and illness. *Methods:* We studied the number of life events experienced by hip fracture patients, nonfracture rheumatology patients, and community-dwelling asymptomatic residents in the year before interview. Fifty-four hip fracture patients, 63 ambulatory patients, and 115 community-dwelling residents participated in the study. All were older than 65 years. Descriptive statistics and nonparametric analyses were performed. *Results:* The number of events reported in the previous 12 months was higher for hip fracture patients than for community participants ($p = 0.02$). At least one bereavement was reported by 32% of hip fracture patients, 27% of ambulatory patients, and 26% of community dwellers ($p = 0.8$). Ten percent of all respondents reported experiencing more than one bereavement. *Conclusion:* This has important consequences when considering the care of these patients and the mental distress

they may be experiencing, especially in the aftermath of local disasters or trauma. Medications may not always be the best treatment, and better psychosocial assessments and delivery systems are needed.

Key words bereavement · life events · hip fracture · elderly · health status

Background

In recent years there has been increasing interest in life events and their association with the health and well-being of the elderly. Recent reviews have reported on the development of an illness or an increase in severity in a chronic illness after the occurrence of a major life event or the accumulation of several major life events [1–4]. The importance of major life events and their effect in the chronically ill elderly has been discussed by Sherbourne et al [5]. They reported that different events could have delayed or immediate effects and that age was a mediating factor in the effect.

In a previous study, Peterson et al [6] found that people who had suffered a hip fracture reported a higher number of major life events in the year before their fracture than did a sample of healthy people without fractures drawn from the same community. The authors had avoided surveying people with known health problems when assembling the control group. They had also followed the pattern of previous questionnaires and merely asked about the occurrence of an event, not about the frequency of the occurrence.

This new study was designed to investigate further the number of life events experienced in the previous year by people older than 65 years and to compare the number of such events for those who had subsequently fractured a hip, for nonfracture ambulatory rheumatology patients, and for people living in the community.

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Materials and methods

Study participants

The study was approved by the hospital Institutional Review Board and study participants were informed that participation was entirely voluntary. All participants were aged 65 years or older. None of the participants in the current study had participated in the previous study. Hip fracture patient participants were recruited among those patients who had been treated for a fractured hip at New York Presbyterian Hospital, a major referral center in New York. New York Presbyterian Hospital and Hospital for Special Surgery are affiliated with Cornell University, thus facilitating the collaboration.

These people were asked to participate in the study 3 or 4 weeks after the fracture, so that the effect of postsurgical pain and medications on their recall was minimal. In addition, we recruited from people living in the community, those who attended education programs at the hospital, and from residents of some nursing, rehabilitation, and community homes. The residents of homes were recruited in an effort to recruit less active and older participants. A third group was recruited from ambulatory people with rheumatic disease. Our earlier study had raised questions about people who specifically had medical problems, and recruiting ambulatory patients would answer some of these questions.

In addition to recording the total counts by all respondents, “matched” groups were drawn from those who completed most of the demographic questions. Those in the ambulatory and community control groups who reported a hip fracture in the previous 12 months were removed. This comprised the matched subset of the data.

Procedure

An extended version of the Holmes and Rahe Social Readjustment Scale [7] used in the earlier study [6] was pilot tested on a group of people older than 65 years. A few items were added. The language level was adjusted and some minor alterations were made as suggested by our test group. Each question asked if an event had occurred in the previous 12 months and, if it had, whether it had no effect, a little effect, or a great effect on the participant. Participants were asked about the different events. The questions on change in the health of a family member, death of a close family member, and death of a close friend were extended to allow the recording of up to 4 such events each. In addition, participants were asked to complete a short demographic questionnaire. In several cases, people refused to complete the demographic section although names were not requested.

Data analysis

A total score was calculated for each person by counting the number of events that occurred, but even this could be done in one of two ways. We counted each type of event once. In other words, “Did this event occur ever?” This mirrored the

score on the form in our earlier study. The other way, we counted each recorded occurrence. This gives more weight to the deaths and changes in health, since those were the questions that allowed more than one occurrence to be recorded. If two siblings died, then in the first total, one would be added for a family death, but in the second total, two would be added because two deaths occurred.

In addition, for each person the occurrences could be weighted by the effect that the event had. We scored “occurred but no effect” as a 1, “a little effect” as a 2, and “a great effect” as a 3. These scores were then added to give a total “effect” score.

The data were analyzed using SPSS. In general, non-parametric comparisons were used for comparing the scores because these were frequency data and because there were “floor” effects and the data were skewed. Pairwise comparisons are corrected for that particular analysis, but values are not corrected in general for multiple comparisons.

Results

There were 232 responses in all: 54 hip fracture patients, 63 ambulatory patients, and 115 community-based partici-

Table 1 The most commonly occurring events that “affected” people^a

Event	All participants who were affected by event		Participants living in community who were affected by event	
	<i>n</i> = 222	%	<i>n</i> = 112	%
Change in work hours	15	6	11	10
Change in sex life	13	7	6	5
Other	17	7	6	5
Retirement	19	8	10	9
A new family member	18	8	8	7
Revision of personal habits	19	8	7	6
Change in living conditions	20	9	9	8
Change in family gatherings	26	11	14	13
Outstanding personal achievement	30	13	18	16
Change in recreation	32	14	11	10
Financial problem	32	14	11	10
A family death	32	14	17	15
Death of a friend	40	17	22	19
Other family problem	45	19	21	19
Change in social life	47	21	16	14
Family health problem	49	21	24	21
Change in sleeping habits	50	22	24	22
Change in activities	57	26	23	20
Previous illness	92	40	30	27

^a These events not only occurred, but also had an effect (scored a 2 or a 3). Community and ambulatory figures exclude those who reported a fractured hip. Percentages were calculated from those who responded to the question.

Table 2 Number of bereavements in previous 12 months^a

Number deaths per respondent	Number and percentage of respondents, <i>n</i> (%)			
	Hip fracture (<i>n</i> = 54)	Ambulatory (<i>n</i> = 56)	Community (<i>n</i> = 112)	Total (<i>n</i> = 222)
0	37 (69)	41 (73)	74 (65)	152 (68)
1	12 (22)	10 (17)	24 (22)	46 (21)
2	4 (7)	2 (3)	10 (10)	16 (7)
3	0	2 (3)	2 (2)	4 (2)
4	1 (2)	1 (3)	2 (2)	4 (2)

^a Number of people reported dead per respondent counting all friends, family, and spouses.

pants, including those from the homes. Seven (11%) of the ambulatory patients and 3 (3%) of the community participants had suffered a hip fracture in the previous 12 months. Because we did not know how long before completing the questionnaire the fractures had occurred or which other events had occurred before or after the fracture, these people were dropped from the main analysis.

The data from the remaining 222 people were analyzed. The most common events experienced were illness 94 (41%), change in activities 67 (29%), change in sleeping habits 59 (26%), and change in social life 59 (26%). Of the community group, 29% had experienced an illness, of the ambulatory group 55% experienced illness, and of the hip fracture group 48% experienced an illness other than the hip fracture. The most commonly occurring events that affected (as opposed to just occurred) people are shown in Table 1 (events scored as a 2 or a 3 for effect). These numbers are slightly smaller than the number of events that occurred.

Of these 222 people, 7 (3%) reported the death of a spouse, 35 (15%) reported at least one death in the family, and 46 (20%) reported the death of at least one friend. The number of bereavements that respondents reported experiencing in the previous 12 months is shown in Table 2. Most of the deaths that occurred were reported to have affected the respondent. The number of deaths that affected each respondent is shown in Table 3. In general, about 32% of the people had been affected by at least one death in the past year and 10% of the people were affected by more than one death.

Table 3 Number of deaths that “affected” each respondent (scored a 2 or a 3 for effect)

No. of deaths that affected each respondent	Number and percentage of respondents <i>n</i> (%)			
	Hip fracture (<i>n</i> = 54)	Ambulatory (<i>n</i> = 56)	Community (<i>n</i> = 112)	Total (<i>n</i> = 222)
0	38 (70)	42 (75)	76 (68)	156 (70)
1	12 (22)	10 (17)	24 (21)	46 (20)
2	3 (6)	2 (3)	8 (8)	13 (6)
3	0	1 (2)	2 (2)	3 (1)
4	1 (2)	1 (3)	2 (2)	4 (2)

Table 4 The results of scoring the total score by different methods on the matched groups

	Study population	Mean (SD)
Count of type of life event, each type that occurred = 1 ^a	Hip fracture	3.4 (3.5)
	Ambulatory	4.0 (3.5)
	Community	3.0 (3.0)
Total of occurrences, each death = 1 ^b	Hip fracture	3.7 (3.6)
	Ambulatory	4.0 (3.5)
	Community	3.0 (3.0)
Count of types of life events with “great effect” only ^c	Hip fracture	2.6 (2.9)
	Ambulatory	2.7 (2.8)
	Community	1.5 (2.5)
Count of number of occurrences with “great effect” ^d	Hip fracture	2.8 (3.0)
	Ambulatory	2.7 (2.8)
	Community	1.5 (2.5)

Note. Total number of the study population is 128: hip fracture patients, *n* = 53; ambulatory patients, *n* = 33; and community participants, *n* = 42.

^a Each type of life event that occurred scores 1 point. Multiple deaths of friends count as one point.

^b Each occurrence scores 1 point, so 3 deaths score 3 points.

^c Each time a life event has a “great effect”, it scores 1 point. Multiple occurrences ignored.

^d Each occurrence which has a “great effect” scores 1 point.

The subgroups were then compared. To do this, all those with incomplete demographic records were discarded. This left 187 people. The average ages were hip fracture subgroup 82±9, ambulatory 75±7, and community 73±7 ($p < 0.001$). The groups also differed on years of education ($p < 0.001$) and income ($p = 0.05$). The ambulatory and community respondents tended to be better educated and to have higher incomes. More of the ambulatory patients resided outside New York state ($p = 0.003$). The male to female ratio was 0.17 in the hip fracture participants, 0.65 in the ambulatory, and 0.28 in the community ($p = 0.01$). The ethnicity was 91% white. More of the fracture group were widowed (54%) and more of the ambulatory group were married (52%) ($p < 0.001$).

The community and ambulatory groups were adjusted to more closely match the hip fracture group by retaining those in the other two groups who matched on education, age, and sex, etc. The one respondent with a hip fracture who was 105 years old was dropped as no ambulatory or community respondent was older than 95 years. This left 128 people. The male/female ratio overall was 0.25 ($p = 0.4$) by subgroup. The average ages were hip fracture patient 81±9 years (*n* = 53), ambulatory patient 78±5 years (*n* = 33), and community participant 78±6 years (*n* = 42) ($p = 0.09$).

The number of people who experienced at least one death was 17 (32%) in the hip fracture group, 9 (27%) in the ambulatory group, and 11 (26%) in the community ($p = 0.8$). Those in the community always averaged fewer events than either the ambulatory or hip fracture groups. In most instances, the sample sizes were too small to show statistical significance, except where the events that had a “great effect” were considered. The results are shown in Table 4.

Discussion

The original scale was based on the Holmes and Rahe Social Readjustment Scale, a scale that was carefully designed and had a large group of subjects assign weights to the events [7]. However, the weights were assigned out of context, and how they should be adjusted for age, circumstances, and multiple events is problematic. Many life event scales ask about only one occurrence and do not give respondents a chance to report multiple occurrences of the same event. For example, the Life Experiences Survey asks about events over the past year and lists the possible deaths, injuries, or illnesses of all family members, but only asks about death of a close friend once [8]. There is one interesting study that focuses on two measures of stress measurement, “daily hassles” and “uplifts”. While respondents are asked, “how severe the hassle has been” in the last month, they are then asked, “how often the uplift has occurred” [9], so only the uplift scale had a measure of frequency. In developing the CRISYS scale, which asked for a 6-month recall, Shalowitz et al [10] deliberately restricted the scale to recording only occurrence, not frequency.

As mentioned previously, Sherbourne et al [5] examined the effect of age on the effect of life events. Murrell et al [11] had concluded that for older respondents individual events might not have much effect on health and functioning since cumulative earlier experiences would outweigh them. Lichtenberg et al [12] found that older adults with osteoarthritis were less affected by life stress and that subjective pain was lower for older adults despite greater arthritic severity.

Cohen [13] has discussed the scoring of life scales, the nonadditive nature of events, and possible threshold effects. The identification of positive and negative events has been thought to be crucial to scoring. However, we were not so much interested in the depressive effects of life events as in their distracting effect. Life events that have a great effect, whether they are negative or positive, distract the subject from their daily routine and normal precautions and may therefore place them at a greater risk for injury or infection. A recent study [14] reported that low-income black women who attended public prenatal clinics and who experienced the death of a mother or sister during pregnancy delivered on average 4.6 weeks earlier than those who had not suffered a similar bereavement. Furthermore, Martin et al [15] showed a high association between stressful life events and the abuse of pregnant women.

Other recent studies and reports have focused heavily on depression in both the community and patients [16–18] and, linked to this focus, an examination of the association between depression and mortality has evolved [19]. The study of depression in patients has been encouraged with regard to the treatment of depression.

A study of patients who had been hospitalized after a hip fracture or a stroke found that the number of severe life events after the signature event was associated with anxiety, but not depression [20]. Social contacts mitigated the effect of severe life events. The rates of events were high, 49% had suffered a “severe” life event and 16% the death of a

significant other in the 6 months before hospital admission. Forsen et al [21] studied the relationship between medication, depression, and hip fracture. Both medication and depression have been associated in some studies with an increased risk of fracture. The Forsen study found that risk of hip fracture was associated with prior mental distress even after correcting for medication use. This is an important finding because in many studies, it had been claimed that it was the medication, not the mental distress, that led to falls.

Our finding of an association between the increased occurrence of major life events and a subsequent hip fracture suggest that hip fractures are associated with previous distraction or distress. That patients with a chronic disease, many of whom were experiencing increased symptoms, should also have experienced a previous high incidence of major life events is not surprising. Other investigators have reported increased symptoms or investigated associations in such situations [5, 12, 22].

Sherbourne et al [5] examined patients with hypertension, diabetes, and coronary heart disease. They found that those with financial problems had lower physical functioning and those with bereavement had lower emotional well-being (although we are not told which came first). The authors stress the importance of identifying and dealing with psychosocial problems in patients with chronic diseases, but there is no indication that this message has been heeded, at least in the United States.

Lunghi et al [22] studied patients with osteoarthritis of the hip and followed them up using diaries for 6 months. However, their sample size of 18 was relatively small and they found associations only at the weekly level, a comparatively short time. Furthermore, their results were collected for only 6 months, which is a shorter period than other studies. Lichtenberg et al [12] studied a cross-sectional group of osteoarthritic patients so that associations had no temporal direction.

None of these studies compared those seeking medical aid to the community norm for stressful life events and all seemed to treat bereavement as a single event. Furthermore, in the case of Lunghi et al [22], all events seemed to be assumed to have a unique short-term effect. We found the ambulatory group had life event scores that were not significantly different from those that had fractured a hip. Moreover, when a previous hip fracture was included as an event effectively increasing the sample size since these people had been excluded, the mean score increased from 2.43 to 4.43 for the ambulatory sample. The main concern is that both ambulatory patients and hip fracture patients may be medicated rather than aided. The problem is to define what aid is possible and not just to medicate, especially as such medications may place the patient at risk for future falls [23].

In the current study, those who had sustained a hip fracture were removed for most of the analysis from the two groups not specifically targeted as hip fracture patients, because of the difficulty of deciding whether the fracture event was at least partially caused by previous life events or just one of the stressors for that individual. Similar arguments as to cause and effect can be made for events such as heart attacks, strokes, family fights, or indeed many events,

but our main concern had been hip fracture patients. After the events were tallied, the groups were matched to attempt to control for the effects of age, etc., reported by Sherbourne et al [5]. Moreover, whereas the very old may be accessed as hip fracture patients, we were not able to recruit anyone older than 95 years in the community, presumably because of a protected lifestyle.

Feedback from our participants included the information that all items should allow for multiple occurrences to be recorded, especially for such items as job losses and financial setbacks. Some participants wrote these on the forms. It is obvious in these modern times with major transportation accidents and other traumatic events that multiple bereavements, etc. occur.

Our finding that 32% of the total sample suffered a bereavement, and 30% were affected by the bereavement, is higher than the 16% reported by Sherbourne et al [5] but less than the 40% reported by Murrell et al [24]. In the study by Bond et al [20], the rate of 16% bereavement in the preceding 6 months is compatible with our 30% rate. However, we found the rate of bereavement in the community to be nearly as high as that of the patients. Including those with previous fractures does not alter these percentages. Furthermore, the effects of bereavement extend beyond one year [5], so that the total burden may be even greater. What is important is that 11% of the total sample suffered more than one bereavement in the year, which is a heavy burden even without other factors. Under such circumstances, it is difficult to “be more positive” when such advice is offered, neither is another medication necessarily the best treatment.

The study by Bond et al [20] found that severe life events were associated with anxiety, but that depression was only poorly associated with severe life events. In addition, they found that a major ameliorating factor in recovery was the existence of a confiding relationship. They stress that health care and social care facilities will increasingly be called upon to help lonely older people. Facilitating an effective social network for an aging population is neither a simple nor an easy task. However, increasing numbers of studies have shown that stressful life events are associated with accidents and increased medical visits. This has been followed by a call for an increased treatment of depression, but it would seem very important to distinguish between clinical depression and increased anxiety. The distinction between depression and increased anxiety is not always easy to make in individual cases, as opposed to research samples, especially for a busy medical practitioner. Furthermore, many medications either directly affect balance and reaction times or lead to overconfident and risk-taking behaviors.

Conclusion

In conclusion, 15% of our total sample reported the death of at least one family member, and 19% the death of a friend in the previous 12 months. Furthermore, 32% of the sample reported at least one death and 11% reported more than one death. This has important consequences when considering the

care of these patients and the stresses they may be suffering, especially in the aftermath of local disasters. Medications may not always be the best treatment, and better psychosocial assessment and delivery systems are needed. In addition, further study of the effect of serious life events and their cumulative outcome is indicated. Questionnaires asking only about the single occurrence of a type of event run the risk of ignoring the possible effect of multiple strikes.

Author's Contribution

MGEF helped design the study, oversaw the data collection, performed the statistical analysis, and worked on the drafts of the manuscript. JPA helped design the study, aided with data collection locations and worked on the drafts of the manuscript. CRM helped design the study, aided with interpretation and worked on the original draft of the manuscript. DH helped design the study, aided with data interpretation and identifying data collection locations and worked on the later drafts of the manuscript. SAP helped design the study, aided with the data interpretation and worked on the drafts of the manuscript. MP helped design the study, helped with the data collection, and worked on the drafts of the manuscript. All the authors approved the final version.

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