

THE MEASUREMENT OF STRESS ASSOCIATED WITH HOSPITALIZATION

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SYNOPSIS

This study was undertaken to develop a hospital stress rating scale for use in Singapore. Two hundred and sixty-six patients from two local general hospitals served as subjects in this study. They were asked to rate, on a 11-point scale, the stress level of 50 events most commonly experienced in hospital setting. The results indicate very high consistency of rating ($\rho = .89, p < 0.001$) between medical and surgical patients. Using Thurstone's scaling method, the scale value of each event was derived. The sum of the scale values for the events a patient encountered would indicate his stress level associated with hospitalization. Application of the findings was discussed and suggestion for future evaluation studies made.

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INTRODUCTION

One of the many factors which may affect inpatients' process of recovery is the amount of stress they experience during hospitalization. For example, unfamiliarity of surrounding, threat of severe illness, and loss of independence are some possible stressful events speculated to have an adverse effect on treatment outcomes⁽¹⁾. In order to establish such relationship empirically, however, a quantitative and objective measure of hospital stress needs to be developed. This study was undertaken to develop such a measure so that stress as a predictor of treatment outcomes (e.g. length of stay, use of pain

medication) can be evaluated and suggestion for minimizing hospital stress made.

SUBJECTS

The subjects of this study were 266 patients (178 males and 88 females) from medical (N = 165) and surgical wards (N = 101) of two general hospitals, the Singapore General Hospital and Tan Tock Seng Hospital, in Singapore. The education levels of these patients (aged from 16 to 62, mean age = 34.62, SD = 14.41) are listed in Table 1.

Table 1.
DISTRIBUTION OF SEX BY EDUCATIONAL LEVEL OF SUBJECTS

	No Formal Education	Primary	Secondary	Pre-University	Tertiary
Male	51	8	64	19	36
Female	17	10	40	11	10
Total	68	18	104	30	46
%	25.5	6.8	39.1	11.3	17.3

MEASUREMENT

A list of events commonly encountered by hospital patients was adapted from studies of Volicer and his co-workers^(2, 3). The following are criteria used for including events in the list.

- The event should be experienced fairly commonly by general hospital patients.
- It should be likely experienced by patients within a day or two after admission to hospital.
- The likelihood of experiencing the event should not be too dependent on the seriousness of illness.
- The event should be specific enough that a patient may determine easily whether he or she had experienced it.

Except for one item which was changed slightly, all of the 49 events included in the studies of Volicer et al. were adopted without modification. The changed item was originally stated as 'Not having enough insurance to pay for hospitalization'. It was changed to 'Not having enough money to pay for hospitalization', which is more appropriate to the local situation. In addition to the 49 events,

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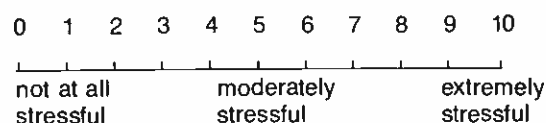
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an extra item, ie. 'Having to eat food not used to', was also included in the list. Hence, the present list consisted of a total of 50 events (see Table 2).

PROCEDURE

The list of 50 events was presented to the subjects for rating of stress level. Eleven numbers (0 to 10) were printed next to each event and subjects were asked to circle one of the numbers to indicate the level of stress associated with the event. The following instructions were given:

"The following is a list of events that may be experienced by hospital patients. Please rate how stressful these events could be by using the following stress rating scale:



In rating each event, please circle a number next to the item. The number indicating the stress level can be any number from 0 to 10, depending on how stressful you think the event could be. Events requiring more time and effort to adjust to are considered more stressful."

At the end of the list, patients were asked to add in any stressful events they think hospital patients may experience but have been left out. They were also asked to indicated the stress level of the events they have added by using the same 11-point rating scale.

RESULTS AND DISCUSSION

About 10% of the subjects had added one to three events to the list. The frequency and average rating of the two events most commonly added are listed below:

	(freq.)	(rating)
Not enough staff in the ward	4	8.75
Having to eat in the presence of visitors	3	4.67

None of the other events added was repeated by more than one subject. As the events added by subjects did not meet the criteria for inclusion, the present analysis was based on the rating of the 50 events.

The median and the mean value of the rating of each event were first computed. The 50 events were then ranked from least to most stressful, according to their median values. The resulting rank-ordered list of events is shown in Table 2. This ranking correlates almost perfectly (rho = .98, P < .001) with that ranked by mean values.

Table 2.
**RANK ORDER OF STRESSFUL EVENTS
 ASSOCIATED WITH HOSPITALIZATION AS RATED
 BY 266 MEDICAL AND SURGICAL PATIENTS**

Rank		Median	Mean			
1.	Having strangers sleep in the same room with you	1.93	2.72	16.	Having the staff be in too much of a hurry	5.01 4.80
2.	Having to sleep in a strange bed	2.48	3.26	17.	Missing your spouse	5.04 4.97
3.	Having strange machines around	2.58	3.33	18.	Being in the hospital during holidays or special family occasions	5.10 5.07
4.	Having to eat at different times than you usually do	2.59	2.97	19.	Being in a room that is too cold or too hot	5.12 5.21
5.	Having to wear a hospital gown	2.62	3.52	20.	Having nurses or doctors talk too fast or use words you can't understand	5.17 5.09
6.	Being cared for by unfamiliar doctor	3.70	3.82	21.	Being put in the hospital because of accident	5.18 4.89
7.	Having a roommate who is seriously ill or cannot talk with you	4.52	4.14	22.	Being hospitalized far away from home	5.19 5.15
8.	Being awakened in the night by the nurse	4.54	4.25	23.	Having a roommate who is unfriendly	5.21 5.23
9.	Having to be assisted with bathing	4.64	4.55	24.	Having to stay in bed or the same room all day	5.25 5.25
10.	Having a roommate who has too many visitors	4.67	4.39	25.	Not having enough money to pay for your hospitalization	5.26 5.21
11.	Having to eat food not used to	4.72	4.41	26.	Not having family visit you	5.28 5.17
12.	Being aware of unusual smell around you	4.80	4.74	27.	Having medications cause you discomfort	5.29 5.20
13.	Thinking your appearance might be changed after your hospitalization	4.85	4.77	28.	Not being able to call family or friends on the phone	5.31 5.08
14.	Worrying about your spouse being away from you	4.89	4.72	29.	Not having your questions answered by the staff	5.32 5.22
15.	Not having friends visit you	4.92	4.66	30.	Not being able to get newspaper, radio or TV when you want them	5.32 5.40
				31.	Having to be assisted	

32.	with a bedpan Thinking about losing income because of your illness	5.33	5.24	41.	surgery or test procedures	7.09	6.60
33.	Not having your call light answered	5.46	5.40	42.	Not getting relief from pain medication	7.32	6.59
34.	Feeling you are getting dependent on medications	5.48	5.63	43.	Not being told what your diagnosis is	7.65	6.44
35.	Having to eat cold or tasteless food	5.50	5.64	44.	Not getting pain medication when you need it	7.74	6.60
36.	Not knowing when to expect things will be done to you	5.53	5.59	45.	Not knowing for sure what illness you have	7.90	6.64
37.	Knowing you have to have an operation	6.19	6.06	46.	Being fed through tubes	8.00	6.46
38.	Having a sudden hospitalization you weren't planning to have	6.82	5.97	47.	Thinking you might lose your hearing	8.82	6.57
39.	Not knowing the results or reasons for your treatments	6.83	6.26	48.	Knowing you have a serious illness.	8.90	7.10
40.	Thinking you might have pain because of	7.02	6.22	49.	Thinking you might lose your sight	9.17	6.77
				50.	Thinking you might lose a kidney or some other organ	9.56	7.43
					Thinking you might be cancer	9.71	7.63

Using Thurstone's scaling method⁽⁴⁾, the median values of the events provide the scale values of the items. In applying the findings of this study to assess how much stress a patient has experienced, one can ask the patient to check from the list of events, the ones that he has experienced during hospitalization. This sum of the median values, ie. the total scale values for the events he has experienced, will provide a hospital stress score for the patient. To illustrate, patient A has checked that he has experienced the following events during his stay in the hospital, namely:

	(Scale Value)
Not knowing for sure what illness you have	7.90
Being fed through tubes	8.00
Not being told what your diagnosis is	7.65

The total scale values of the three events, ie. 23.55 (7.90 + 8.00 + 7.65), would serve as an indicator of the stress level associated with hospitalization. The higher the score, the higher the level of stress he experienced. This scoring method is different from that adopted by Volicer et al.^(2, 3) who used rank scores instead of scale values as indicator of hospital stress. Rank scores may be simpler and more straightforward in practice, but it is questionable whether they can be subjected to further mathematical operations as they are scores on an ordinal scale. The scale values, on the other hand, are not limited by this difficulty and certainly provide a more refined and accurate measure of hospital stress.

In order to ascertain the consistency of rating between medical and surgical patients, the list of 50 events were also ranked separately according to the

median values obtained from the two respective groups of patients. Rank order correlation between the two sets of ranking was found to be .89 ($p < .001$), indicating very high consistency between medical and surgical patients.

From Table 2, one can also see that several items rated as highly stressful are events concerned with lack of information about one's condition. These include 'Not knowing for sure what illness you have', 'Not being told what your diagnosis is', 'Not knowing the results or reasons for your treatments', etc. They are related as much more stressful than events related to day-to-day inconveniences of the hospital situation, eg. 'Having strangers sleep in the same room with you', 'Having to eat at different times than you usually do', or 'Being awakened in the night by the nurse'. These findings, which are consistent with those reported in Volicer's studies, should have significant implications for minimizing stress associated with hospitalization.

To conclude, the rating scale developed in this study provide a quantitative measure of psychosocial stress experienced by general hospital patients. High consistency of rating was found between medical and surgical patients. Nevertheless, studies may be needed to assess the test-retest reliability of the scale. To further establish its validity, studies may also be conducted to examine the statistical relationship between scores on this scale and criteria of treatment outcomes or other measures of life stress and anxiety.

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