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LIFE EVENTS ASSOCIATED WITH MAJOR DEPRESSION IN UGANDAN PRIMARY HEALTHCARE (PHC) PATIENTS: ISSUES OF CULTURAL SPECIFICITY

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ABSTRACT

Objective: The study compared life events experienced by depressed patients seen at primary healthcare (PHC) centres with those among healthy community controls.

Method: Data was collected from 74 depressed patients and 64 unmatched controls from village locales of patients. Interview instruments included the depression module of the Mini International Neuropsychiatric Interview (MINI) and Interview for Recent Life Events (IRLE). Associations between type of respondent and demographic variables were examined. Statistical comparisons were done for the two groups on other variables.

Results: Most depressed patients were single by marital status, lacked formal employment and had less post-primary education. They had experienced more life events; job changes, discomforting working hours, unfavourable working conditions, and job losses; personal health problems; loss of valuables; difficulties with intimate partners and family members' marital problems. Independent life events were more among depressed patients and clustered around work, health, bereavement and marriage. Most events reported by depressed patients had high negative impact ratings compared to controls.

Conclusion: Compared to healthy community controls, depressed patients reported more undesirable life events. The relationship between life events and depression implies that in PHC settings of poor countries, deploying mental health-oriented workers to manage life events may lessen escalation of distress.

Key words: depression, life events, primary healthcare, Uganda

INTRODUCTION

Depression has been described as the 'common cold of psychiatry', responsible for completed suicides, increases in disability-adjusted life-years (DALYs) and the high disease burden (Kasoro *et al.*, 2002; Kirigia & Sambo, 2003; Newton, 1988; Ustun *et al.*, 2004; WHO, 2000). Among outpatients attending primary healthcare (PHC) clinics in sub-Saharan Africa, as many as 20–35% have been reported to present with depression as the reason for seeking healthcare (Heggenhougen, 1995).

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This is higher than the 13.5% prevalence of major depression found in a similar population in south-eastern Michigan, USA (Coyne *et al.,* 1994) but comparable to 24–31% prevalence of anxiety and depression in Zimbabwe and South Africa (Abas & Broadhead, 1997; Rumble *et al.*, 1996). Whereas Orley *et al*. (1979) in a study of two Ugandan villages put community prevalence at 18.5%, Bhagwanjee *et al.* (1998) in a South African community found a 4.8% prevalence showing a likely disparity in instruments used and study populations. Depression is a known co-morbid condition with many physical illnesses, often complicating treatment outcomes and causing significant functional impairment (Staab & Evans, 2001).

Though personality, lifestyle and genetic predisposition are culpable as either causes or modifying factors of depression, the risk is reported to increase considerably following stressful life events (Brown & Harris, 1989; Paykel, 1994). In spite of such a complex causal relationship, debate on the definitive role of life events in onset and prognosis of depressive disorders is yet to be resolved (Ambelas, 1987; Dejarlais *et al.*, 1995). In this study, we defined a 'life event' as a dateable occurrence representing discrete changes in the subject's social or personal environment that is external and verifiable rather than internal or psychological (Paykel, 1994; Rafanelli *et al.*, 2005). Whereas primary prevention of depression by avoiding certain life events like deaths or losses may not be feasible, specific salient life events have been noted as invaluable cues for rapid crisis interventions and other forms of support (Paykel, 1994).

In spite of the increasing literature on the role of life events in illness, life events research is fraught with methodological challenges, notably, difficulties of obtaining reliable and valid life events information preceding depression, and problems of assessing the extent to which life events are independent of ongoing illness (Leskela *et al.*, 2004; Paykel, 2003). Another challenge is quantification of the impact and meaning of an event for a patient. Patients are different in their resilience. The same kind of event may be experienced in different ways by different patients (Leskela *et al.*, 2004). In assessing the extent of risk in the onset or perpetuation of depression posed by life events, those that are consequences of the illness are supposed to be eliminated (Paykel, 1997). However, determining whether an event happened before or after onset of a given depressive episode is not easy. An example of a methodological challenge arises for individuals like prostitutes who may be raped hence generating life events or placing themselves in risky environments for such events (Christensen *et al.*, 2003; Paykel, 2003).

Various studies have described adverse life events related to health, bereavement, employment, marital and family relationships, as being risk factors for depression (Brown & Birley, 1970; Brown & Harris, 1978). Though the belief that depression results from an interplay of biological, psychological and social factors is credible, there is increasing awareness of the negative impact of psychosocial factors (Christensen *et al.*, 2003; Paykel, 2003; Schmidt *et al.*, 2004; Waite *et al.*, 2004). Somatic health problems, death of close relatives and familial conflicts exemplify groups of life events reported to be associated with affective disorders, especially depression (Christensen *et al.*, 2003).

Literature from sub-Saharan Africa that explores life events associated with current major depressive episodes (MDEs) as seen in PHC settings is very scanty and there is none from Uganda. A few studies relied on psychiatric units in major hospitals to recruit study participants (Ndetei & Vadher, 1984; Ohaeri & Otote, 2002). A Nigerian study found life events like financial problems, unemployment, a family member leaving home and death of a close family member to have a significant association with depression, but documented no gender differences in frequency and desirability of life events among depressed inpatients (Ohaeri & Otote, 2002). A study from

Zimbabwe found that the depressed women were less likely to be in formal employment and have an employed husband, were not likely to have received crisis support following an index event, and were more likely to live in overcrowded housing and to have been separated from their mothers for more than a year before 11 years of age (Broadhead *et al.*, 2001). From Kenya, another study showed that depressed patients had experienced significantly more stressful life events than general population controls (Ndetei & Vadher, 1982, 1984). The research further revealed that independent life events continue to occur after the onset of depression at half the rate of that before the onset. However, none such studies investigated depression among patients seeking care for physical illness at PHC centres. Identifying and documenting life events associated with current MDEs in patients seen at Uganda's PHC centres is vital for developing appropriate interventions to manage and prevent depression.

Aims of the study

In the study, we set out to identify life events that had been experienced by a sample of patients with a current MDE attending PHC centres and compare them to those of healthy community controls in central Uganda. We wanted to find out whether life events occurring to a person within a six-month period were associated with a higher risk of depression. Second, we sought to assess whether life events occurring to such patients had a higher proportion with objective negative impact in the same period.

METHOD

The study setting

The study took place in three PHC centres in three different districts of central Uganda. These were: (i) Naguru Health Centre, located in one of the suburbs of Kampala, the capital city of Uganda; (ii) Kojja Health Centre, a rural-based facility in Mukono district, to the east of Kampala; and (iii) Mpigi Health Centre, located in the semi-urban/semi-rural setting of Mpigi town of Mpigi district, to the south-west of Kampala.

Study design

This was a comparative and analytic study using the unmatched case-control design. We aimed at studying outpatients presenting with a variety of illnesses at PHC centres. The illnesses have different probable determinants and causes. Thus, although matching has its merits, it would have limited our ability to examine risks associated with the matching variables. The cases were adult outpatients at PHC centres attending for various somatic illness or complaints, who we diagnosed to have a current MDE. The controls were non-patients randomly recruited from neighbours of cases in the same villages. A trained psychiatric clinical officer and the first author, assisted by a psychiatric nurse and a clinical social worker, interviewed those who consented. All members of the research team were first trained on how to use the study instruments and in conducting ethical research. Research assistants were unaware of the research questions of the study.

Sample size

The sample size was calculated using the STATCAL Calculator (EPI-INFO 6.04b) for an unmatched case–control design. The confidence interval was set at 95%, power of 80%, and a ratio of cases

to controls of 1:1. Ndetei and Vadher (1982) in their study of types of life events associated with depression in Kenya found that patients with depression generally experienced more specific life events. For instance, the proportion of community controls with an exposure of examination-related crisis was 17.5%, while for depressed patients it was 43%. They found comparable proportions for changes in roles in terms of beginning education in a new school or a new educational course, and separations or other loss-related events. Using these parameters, we derived a sample size of 116 respondents (58 in each group). During fieldwork, we increased the total number of respondents to 148 to take care of proportional variability in exposure to diverse life events.

Study subjects

In face-to-face interviews, patients were asked the first two questions of the MINI current MDE module for purposes of screening (Sheehan & Lecrubier, 1998). A patient was confirmed to have a current MDE if he or she responded in the affirmative to one or both of the first two questions in the module and an additional three or more others in the same MINI module. Therefore, cases met the DSM-IV symptom criteria for a current MDE as specified in the MINI (American Psychiatric Association, 2000; Bolton *et al.*, 2004; Muhwezi *et al.*, 2007; Sheehan & Lecrubier, 1998; Sheehan *et al.*, 1998). Controls were a non-patient group randomly selected from neighbours in same village locales as cases. They thus lived in similar geographical, socio-cultural and economic environments as cases. On diagnostic assessment using the MINI module for a current MDE, they did not meet the specified criteria but potentially experienced life events that were generally as homogeneous as those experienced by cases. All respondents were above 18 years of age, were willing to talk, and gave informed consent.

To recruit the non-patient controls, we were given clearance and guidance from community leaders of villages where patients with a current MDE lived. We approached them and if they agreed to help, their residents joined in the study. A research assistant accompanied each interviewed depressed patient to his/her home and with help from a community leader, made a list of households in the immediate neighbourhood. Using a lottery method, the research assistant randomly selected an appropriate control from the compiled list of households in that neighbourhood. For those selected but not located, a replacement was sought from within the same neighbourhood.

Study instruments

1. Socio-demographic questionnaire

All participants completed a demographic data sheet, which had questions on gender, age, marital status, ethnicity, religious affiliation, number of children and size of family, family structure, educational attainment, occupation and household headship.

2. The Mini International Neuropsychiatric Interview (MINI)

To make a diagnosis of depression, we used the MINI module for a current MDE using the structured categorical 'yes' or 'no' responses. The MINI is designed as a brief structured interview for Axis I Psychiatric Disorders based on DSM-IV criteria. Validation and reliability studies have been done comparing the MINI with the SCID-P and CIDI and results show that it performs well and can be administered in a shorter time period (mean 18.7 ± 16 minutes, median 15 minutes) (Pinninti *et al.*, 2003; Rossi *et al.*, 2004; Sheehan & Lecrubier, 1998; Sheehan *et al.*, 1998). The MINI has been translated and validated in Africa (Moroccan colloquial Arabic) and found to have good psychometric

properties (concordance between the translated MINI and expert diagnoses with kappa values greater than 0.80, inter-rater reliability and test–retest were excellent, with kappa values above 0.80 and 0.90 respectively) (Kadri *et al.*, 2005). Though it is yet to be validated in Uganda, we found the MINI easy to use because the MDE module is straightforward and short to administer.

The first two questions in the MINI module are: (i) being consistently depressed or down, most of the day, nearly every day for the past two weeks; and (ii) loss of interest in most things or lessened ability to enjoy things one used to enjoy for the past two weeks. We used these two questions as the screeners for a current MDE. Patients who responded with a 'yes' to one or both questions were asked to respond to the rest of the module for current MDE. The instrument has an elaborate number of prompts and instructions for the interviewer to steer the interview well.

3. Interview for Recent Life Events (IRLE)

Permission to use the 64-item IRLE, a semi-structured interview schedule, was given by its author (Paykel, 1997). The instrument was used to systematically interview respondents about life events. Detailed enquiries were carried out to determine the exact timing, full nature and circumstances of each life event. Since the study sought to compare depressed patients with community controls, assessment of each event for each respondent was referred to the six-month period immediately preceding the date of the interview (Paykel, 1997). A rating of 6 was for the month immediately prior to the interview date, while 1 was for the event that happened six months before the interview. Events that happened over a period of time were recorded as having occurred at their major point of impact. To improve precision of recall for study participants, we used fairly well-known public occasions like holidays, electioneering periods and historical events in the Ugandan context to act as cues to remember what happened in their lives.

The IRLE categorises possible life events into 10 clusters of work, education, finances, health, bereavement, migration, courtship, legal, family/social relationships and marital relations. Sixty-three life events are specific, the 64th being for any additional events not included elsewhere in the schedule. Interviewers systematically enquired about each event that was applicable and noted whatever each respondent said for later use in rating unclear events. This method is known to increase accuracy (Christensen *et al.*, 2003).

Predefined life events included both major and minor stresses, losses, achievements and status changes that occur in people's lives. For each life event, questions that guided the systematic enquiry were 'To what extent would you say that the event was independent of the patient's condition?' and 'What could have been the overall objective negative impact of the event on the study participant?'. Independence of a life event was taken to be a sense in which it appeared unlikely that the event was a consequence or a potential consequence of the current MDE. For the non-ill (controls), we imagined what would have been the rating had the subject become ill during the period considered (Paykel, 1997, 2003).

In rating independence of each life event, we did not look at merely the relationship of the event to the study participant's health status (depression for patients), but the likelihood that the event was not a consequence or a potential consequence of the psychological or physical state of the respondent (Paykel *et al.*, 1980). Objective negative impact was taken as an evaluation of the degree of unpleasantness, stress or threat that the life event would be expected to bear when its full nature and circumstances are taken into account (Paykel, 1997, 2003; Paykel *et al.*, 1980). The measure was applied in such a way as to be completely uninfluenced by the patient's subjective report of the impact of the life event.

Ethical considerations

Ethical clearances were obtained from the following sources: the Research and Ethics Committees of Makerere University Medical School (Uganda); the Human Research and Ethics Committee of Karolinska Institutet (Sweden); the Uganda National Council for Science and Technology Committee on study of Human Subjects; the District Directors of the Health Services in concerned districts; and, finally, the authorities in charge of PHC centres. Conduct during the study adhered with the Helsinki Declaration (World Medical Association, 2002). Participants in need of specialist attention were referred to appropriate professionals.

Data management and statistical analyses

Data was entered in the EpiInfo computer program and exported to the Statistical Package for Social Scientists (SPSS) version 10.0 for cleaning, editing and analysis. We compared cases and controls on socio-demographics, family structure and life events experienced in the six months prior to the interview using frequency distributions and two-way contingency table analyses (Pearson's χ^2 test with Yates's correction and, when needed, Fisher's exact test statistic). Binary logistic regression (backward stepwise) was used to adjust for possible interaction and confounding of categorical variables while evaluating their association with life events and type of study participant. Type of participant was entered as: case = 1, control = 0. For all continuous variables, means and standard deviations were generated. The total score of different life events assessments was skewed necessitating presentation of range and mean ranks. With skewed variables, the non-parametric Mann–Whitney *U* statistic was used to test associations (Olsen, 2003). Level of significance was set at $p \leq 0.05$.

RESULTS

The sample

Out of 377 patients, 234 (62.1%) who sought healthcare at outpatient departments of PHCs were approached and consented to participate in the study. The 143 non-participants did not differ by demographic description substantially from those who accepted (90 were in a hurry and went away, 28 came to PHCs on days with heavy patient turn-ups, and 25 did not consent). Their inability to participate was not systematic but randomly spread throughout the fieldwork period. Through an oral screening procedure, 74 (31.6%) out of the 234 consenting patients were identified to have a current MDE. To maintain the ratio defined in the sample, we aimed to recruit an equal number of controls from the community. Consequently, 80 potential participants were approached and six did not consent. During data cleaning and analysis, seven out of 74 (9.5%) who gave incomplete data and three out of 67 (4.5%) who fulfilled the criteria for a current MDE were discarded. Thus, data from 64 controls has been used in this paper. Though controls did not meet the criteria for MDE, their scores on the MINI module for major depression symptoms ranged from 4.7% to 29.7%, while proportions for cases were much higher as reported in an earlier publication (Muhwezi *et al.*, 2007).

Demographic characteristics of respondents

By demographic description, there were more females (88 (63.8%)), yielding a female-to-male ratio of 1.8:1 in the total sample. Though there were no significant differences, 53 (71.6%) among

the cases were under the age of 39 years of age, with the highest proportion of 32 (43.2%) between 18 and 29 years of age; for the controls, corresponding proportions were 40 (62.5%) and 22 (34.4%). By ethnic belonging, the Baganda were a majority in both groups (39 (52.7%) versus 40 (62.5%)). By religious affiliation, 67.4% (93) were Christians. Among cases, the Christians were 68.9% (51) while among controls, they were 65.2% (42) and the difference was not significant. The percentage of respondents with post-primary education and of regular income earners was significantly higher among controls. On family structure variables, more cases tended to be single by marital status and to belong to smaller families (Table 1).

Life event clusters among cases and controls

To compare independence, negative impact and occurrence of life events among cases and controls, we converted ordinal scales for assessment of the three measures into nominal ones to enable a bivariate analysis. In assessing occurrence of life events, codes for possible responses were: 1 = six months prior to interview date; 2 = five months prior to interview date; 3 = four months prior to interview date; 4 = three months prior to interview date; 5 = two months prior to interview date; and 6 = one month prior to interview date. The first three responses (1–3) indicated distal life events, while the last three indicated proximal life events. Dichotomisation of 'independence' and 'objective negative impact' measures of life events is explained in the footnotes under Table 6. Cases had experienced significantly more independent life events related to work, health, bereavement and marriage (Table 2). Lastly, life events clustered as work, education, health and courtship/cohabitation had high negative impact ratings for cases (Table 2).

There were no significant differences between cases and controls on the basis of when life events occurred except that on the proximal dimension, cases experienced more health-related life events (25 (33.8%) versus 8 (12.5%) for controls (Crude OR 3.57 (95% CI: 1.47–8.64), $\chi^2 = 7.42$, $p = 0.003$)).

Effects of life events on study participants

Out of the 96 (69.6%) respondents that reported experiencing life events in the six-month period before the interview date, 50 (52.1%) were cases compared to 46 (47.1%) controls. Sixty five (67.7%) of respondents who experienced life events were female. In a stratified analysis, we tested for associations between experiencing a life event (yes or no) and having a current MDE by analysing whether Odds Ratios (ORs) differed significantly by strata of each of the significant demographic variables as shown in Table 3. There were no statistically significant differences between cases and controls for other demographic and family structure variables except for gender, post-primary educational attainment, being single by marital status and regularity of earning an income.

We entered the demographic variables of educational attainment, female gender, experiencing a life event, religious affiliation, being a Ganda by tribe, age categories (18–29, 30–39, 40–49 and over 50 years) and occupation in a binary logistic regression. The final step in the model showed that having regular income, (OR of 0.30; 95% CI: 0.14–0.64, $p = 0.002$), having post-primary education (OR of 0.41; 95% CI: 0.19–0.85, $p = 0.017$) and being female by gender (OR of 0.36; 95% CI: 0.16–0.80, $p = 0.013$) were respectively associated with a current MDE. We separately entered family structure variables of being a parent, marital status, household size, male-headed household, family structure and experiencing a life event in a binary logistic regression. Being single by marital status (OR of 6.37; 95% CI: 1.99–20.41, $p = 0.002$) and living in a nuclear family (OR of 2.30; 95% CI: 1.02–5.22, $p = 0.046$) were positively associated with a current MDE.

Table 1
Demographic characteristics by category of respondents

Demographic characteristics	Category of respondent				
	Cases (n = 74)	Controls (n = 64)	χ^2	p value	Crude OR (95% CI)
	n (%)	n (%)			
Gender					
Male	31 (41.9)	19 (29.7)	1.72	0.190	1.71 (0.84–3.47)
Female	43 (58.1)	45 (70.3)			
Education level					
Never gone to school	8 (10.8)	4 (6.3)	0.42	0.519	1.82 (0.52–6.35)
Primary level	39 (52.7)	24 (37.5)	2.61	0.106	1.86 (0.94–3.67)
Post-primary level[1]	27 (36.5)	36 (56.3)	4.64	0.031*	0.45 (0.23–0.89)
Occupation					
Peasants[2]	13 (17.6)	9 (14.1)	0.11	0.743	1.30 (0.52–3.28)
Regular income earners[3]	32 (43.2)	44 (68.8)	8.02	0.005*	0.35 (0.17–0.69)
No formal job[4]	29 (39.2)	11 (17.2)	7.04	0.008*	3.11 (1.39–6.91)
Marital status					
Married	36 (48.6)	39 (60.9)	1.62	0.203	0.61 (0.31–1.19)
Single	21 (28.4)	4 (6.3)	9.89	0.002*	5.94 (1.92–18.42)
Once married but separated[5]	17 (23.0)	21 (32.8)	1.21	0.272	0.61 (0.29–1.29)
Parenthood					
Yes, I have children	57 (77.0)	57 (89.1)	2.67	0.102	0.41 (1.16–1.07)
No, I have no children	17 (23.0)	7 (10.9)			
Number of children for respondents that were parents[6]					
Few children (1–4)	36 (63.2)	33 (57.9)	0.15	0.702	1.25 (0.59–2.65)
Many children (5 and more)	21 (36.8)	24 (42.1)			
Family structure					
Nuclear family	26 (35.1)	18 (28.1)	0.49	0.485	1.38 (0.67–2.86)
Extended family	22 (29.7)	28 (43.8)	2.34	0.126	0.54 (0.27–1.09)
Single-parent family	20 (27.0)	13 (20.3)	0.52	0.470	1.45 (0.66–2.22)
Single-person family	6 (8.1)	5 (7.8)	0.00	1.000	1.04 (0.30–3.59)
Family size					
Small (1 to 6 members)	63 (85.1)	45 (70.3)	3.60	0.058*	2.42 (1.05–5.58)
Large (7 and more people)	11 (14.9)	19 (29.7)			

[1] Post-primary include those with some secondary education and above (post-secondary).
[2] Peasants are respondents whose only occupation was tilling the land for survival.
[3] Regular income earners include business people and salaried workers.
[4] No formal job includes students, housewives and the unemployed.
[5] Once married but later separated, divorced or widowed.
[6] Respondents who were parents were 114 in total (57 cases) and (57 controls).

We used the Pearson χ^2 test with Yates's correction.

For comparison in variables with more than two categories, the total for all categories was used for reference purposes.
* Significant at $p \leq 0.05$.

Table 2
Assessment of independence and meaning for life event clusters among cases and controls

Life events clusters	Category of respondent				
	Cases ($n = 74$)	Controls ($n = 64$)	χ^2	p value	Crude OR (95% CI)
	n (%)	n (%)			
Assessment of independence of life events					
Independent work-related life events	11 (14.9)	1 (1.5)	6.07	0.014	11 (1.75–67.75)
Independent education-related life events	6 (8.1)	10 (15.6)	1.23	0.267	0.48 (0.17–1.39)
Independent finance-related life events	17 (23)	25 (30.1)	3.47	0.062	0.47 (0.22–0.97)
Independent health-related life events	22 (29.7)	4 (6.3)	10.89	0.001	6.35 (2.14–18.69)
Independent bereavement-related life events	21 (28.4)	7 (11)	5.42	0.020	3.23 (1.29–8.01)
Independent migration-related life events	5 (6.8)	1 (1.5)	1.15	0.283	4.57 (0.68–30.09)
Independent courtship/cohabitation-related life events	4 (5.4)	2 (3.1)	0.06	0.813	1.77 (0.36–8.54)
Independent legal-related life events	–	–	–	–	–
Independent family social life events	–	–	–	–	–
Independent marital life events	12 (16.2)	3 (4.7)	3.59	0.058	3.94 (1.13–13.58)
Assessment of negative impact of life events					
Negative impact of work-related life events	22 (29.7)	7 (10.9)	6.21	0.013	3.45 (1.39–8.53)
Negative impact of education-related life events	34 (46)	9 (14.1)	14.81	< 0.001	5.19 (2.27–11.85)
Negative impact of finance-related life events	28 (37.8)	19 (29.7)	0.69	0.408	1.44 (0.71–2.93)
Negative impact of health-related life events	40 (54.1)	15 (23.4)	12.17	< 0.001	3.84 (1.85–7.98)
Negative impact of bereavement life events	30 (40.5)	18 (28.1)	1.82	0.178	1.74 (0.86–3.54)
Negative impact of migration-related life events	8 (10.8)	3 (4.7)	1.02	0.313	2.47 (0.67–8.94)
Negative impact of courtship/cohabitation life events	14 (19)	2 (3.1)	11.12	0.001	10.85 (2.59–44.19)
Negative impact of legal-related life events	6 (8.1)	2 (3.1)	0.78	0.377	2.74 (0.60–12.25)
Negative impact of family social life events	14 (18.9)	7 (11)	1.32	0.287	1.90 (0.73–4.91)
Negative impact of marital life events	15 (20.3)	6 (9.4)	3.37	0.124	2.46 (0.92–6.56)

Pearson's χ^2 test with Yates's correction was used.
Significant at $p \leq 0.05$.

Table 3
Stratified analysis of life events by demographic variables and category of respondent

Significant demographic variables	Life events occurring in the six-month period prior to the interview date							
	Respondents that reported experiencing life events (n = 96)				Respondents that did not report experiencing life events (n = 42)			
	Cases (n%)	Controls (n%)	χ^2 p-value	Crude ORs (95%CI)	Cases (n%)	Controls (n%)	χ^2 p-value	Crude ORs (95%CI)
Gender								
Male	21 (42.0)	10 (21.7)	3.62	2.61 (1.06–6.39)	10 (41.7)	9 (50.0)	0.05	0.71 (1.06–6.39)
Female	29 (58.0)	36 (78.3)	**0.057**		14 (58.3)	9 (50.0)	**0.823**	
Educational attainment								
Post-primary and above	16 (32.0)	27 (58.7)	5.87	0.33 (0.14–0.76)	11 (45.8)	9 (50.0)	0.00	0.85 (0.25–2.88)
Primary seven and below	34 (68.0)	19 (41.3)	**0.015***		13 (54.2)	9 (50.0)	**1.000**	
Regularity of income								
Regular Income earners	20 (40.0)	31 (67.4)	6.16	0.32 (0.14–0.75)	12 (50.0)	13 (72.2)	1.29	0.39 (0.10–1.42)
Irregular or no income earners	30 (60.0)	15 (32.6)	**0.013***		12 (50.0)	5 (27.8)	**0.257**	
Employment status								
No formal job	21 (42.0)	7 (15.2)	7.07	4.03 (1.51–10.76)	8 (33.3)	4 (22.2)	0.19	1.75 (0.43–7.08)
Having a formal job	29 (58.0)	39 (84.8)	**0.008***		16 (66.7)	14 (77.8)	**0.657**	
Marital status								
Single	10 (20.0)	3 (6.5)	2.66	3.58 (0.92–13.96)	11 (45.8)	1 (5.6)	6.32	14.39 (1.64–126.08)
Others (married or once married)	40 (80.0)	43 (93.5)	**0.103**		13 (54.2)	17 (94.4)	**0.012***	
Family size								
Small (1 to 6 members)	36 (72.0)	27 (58.7)	1.34	1.81 (0.77–4.24)	18 (75.0)	8 (44.4)	2.88	3.75 (1.01–13.91)
Large (7 and more people)	14 (28.0)	19 (41.3)	**0.248**		6 (25.0)	10 (55.6)	**0.090**	

Pearson's χ^2 test with Yates's correction was used.
* Significant at $p \leq 0.05$.

In assessing the relationship between each of the 64 life events outlined in the IRLE and type of respondent, we divided them into two major groups, namely person-related life events (Table 4) and family related life events (Table 5).

Table 4
Proportion of respondents experiencing at least one Person-Related life event

Individual life event enquired about[1]	Cases *n* = 74 (%)	Controls *n* = 64 (%)	χ^2	*p*-value
Work Related Events				
Failure of business	13 (17.6)	10 (15.6)	0.01	0.94[2]
Onset of troubles or disagreements with boss, supervisor or co-workers	9 (12.2)	3 (4.7)		0.14
Substantial change in working conditions, e.g. new boss or change in duties, etc.	8 (10.8)	0 (0.0)		0.01*
Change to a different line of work or job, e.g. begin work for the first time	6 (8.1)	0 (0.0)		0.03*
Substantial change in working hours	6 (8.1)	0 (0.0)		0.03*
Fired from the job or made redundant	6 (8.1)	0 (0.0)		0.03*
Become unemployed for one month or more	5 (6.8)	0 (0.0)		0.06
Get retired from a paid job	1 (1.4)	0 (0.0)		1.00
Total of work-related life events	54 (80.6)	13 (19.4)		
Education-related events				
Begin full-time or half-time education	22 (29.7)	23 (36)	0.35	0.55[2]
Cease full-time education, e.g. graduate or drop out	17 (23)	16 (25)	0.01	0.94[2]
Change in schools	9 (12.2)	13 (20.3)	1.15	0.28[2]
Take a vital examination	2 (2.7)	2 (3.1)		1.00
Important academic failure	3 (4.1)	0 (0.0)		0.25
Total of education-related life events	53 (71.6)	54 (84.4)		
Finance-related events				
Moderate financial difficulties, e.g. defaulting on financial commitments	27 (36.5)	22 (34.4)	0.01	0.94[2]
Major financial difficulties, e.g. bankruptcy, heavy debts, etc.	24 (32.4)	13 (20.3)	1.99	0.16[2]
Major improvements in finances	11 (14.9)	11 (17.2)	0.02	0.89[2]
Total of finance-related life events	62 (83.8)	46 (71.9)		
Health-related events				
Major personal illness, injury or accident	46 (62.2)	10 (15.6)	28.92	< 0.001[2]*
Major physical or emotional illness of close family or significant relative	19 (25.7)	16 (25)	0.00	1.00[2]
Wanted pregnancy	6 (8.1)	2 (3.1)		0.29
Unwanted pregnancy	3 (4.1)	2 (4.7)		1.00
Miscarriage, stillbirth or abortion	3 (4.1)	0 (0.0)		0.25
Birth of a live child	3 (4.1)	0 (0.0)		0.25
Total of health-related life events	80 (108)	30 (46.9)		
Migration-related events				
Move within the city	10 (13.5)	3 (4.7)		0.09
Move to another city	7 (9.5)	1 (1.6)		0.07
Move to another country	1 (1.4)	0 (0.0)		1.00
Total of migration-related life events	18 (24.3)	4 (6.3)		

(Continued)

(Continued)

Individual life event enquired about[1]	Cases $n = 74$ (%)	Controls $n = 64$ (%)	χ^2	*p*-value
Legal events				
Minor violation not leading to court appearance	4 (5.4)	1 (1.6)		0.37
Jail sentence	1 (1.4)	1 (1.6)		1.00
Law suit with legal action, e.g. paying a fine	1 (1.4)	0 (0.0)		1.00
Total of legal-related life events	6 (10.8)	2 (3.1)		

[1] Some respondents reported more than one life event in each cluster. The figures represent the number of individuals with at least one of the relevant type of life event.
[2] Pearson's χ^2 test with Yates's correction was used. Where a χ^2 value is not indicated, the reported significance value was based on Fisher's Exact Test Statistic.
* Statistically significant association.

Table 5
Proportion of respondents experiencing at least one family-related life event

Individual life event enquired about[1]	Cases $n = 74$ (%)	Controls $n = 64$ (%)	χ^2	*p*-value
Bereavement-related events				
Death of close family member (parents, sibling, cohabitee, etc.)	30 (40.5)	23 (35.9)	0.14	0.71[2]
Death of a friend, or a relative	11 (14.9)	7 (10.9)		0.62
Loss/robbery of objects with personal/actual value	11 (14.9)	2 (3.1)		0.02*
Death of spouse	7 (9.5)	3 (4.7)		0.34
Death of own child or adopted child	5 (6.8)	5 (5.8)		1.00
Total of bereavement-related life events	64 (86.4)	40 (62.5)		
Courtship and cohabitation events				
Become engaged	5 (6.8)	11 (17.2)		0.07
Break engagement	2 (2.7)	8 (12.5)		0.03*
Serious argument or difficulties with fiancée/long-term steady sexual partner	10 (13.5)	0 (0.0)		< 0.01*
Cease steady dating of three months or more	4 (5.4)	1 (1.6)		0.37
Total of courtship/cohabitation-related life events	21 (28.4)	20 (31.3)		
Family social events				
New person coming into the household, sharing room and meals with family	11 (14.9)	9 (14.1)		1.00
Serious arguments or problems with resident family members	13 (17.6)	1 (1.6)		< 0.01*
Marked improvement in relating to resident or non-resident family members	9 (12.2)	1 (1.6)		0.02*
Separation from significant person	8 (10.8)	1 (1.6)		0.04*
Marital problems in close family members (parents, siblings)	6 (8.1)	0 (0.0)		0.03*
Child leaving home for reasons like joining college, armed forces, etc.	2 (2.7)	0 (0.0)		0.49
Child married (without approval)	1 (1.4)	1 (1.4)		1.00
Serious arguments with non-resident, non-family members, e.g. neighbour/friends	1 (1.4)	0 (0.0)		1.00
Total of family social events	51 (68.9)	13 (20.3)		

(Continued)

(Continued)

Individual life event enquired about[1]	Cases $n = 74$ (%)	Controls $n = 64$ (%)	χ^2	p-value
Marital Events				
Marriage	17 (22.9)	22 (34.4)	1.67	0.19[2]
Serious arguments with a spouse	11 (14.9)	3 (4.7)		0.05*
Marked improvement in relationship with spouse	8 (10.8)	4 (6.3)		0.38
Extra-marital affair of partner including sporadic infidelity	6 (8.1)	4 (6.3)		0.75
Marital separation of one month or not due to argument	6 (8.1)	3 (4.7)		0.50
Marital reconciliation (couples who have been living apart)	7 (9.5)	0 (0.0)		0.02*
Marital separation due to argument	3 (4.1)	3 (4.7)		1.00
Begin extra-marital affair or engage in sporadic infidelity	3 (4.1)	1 (1.6)		0.62
Divorce settlements	2 (2.7)	1 (1.6)		1.00
Total of marital life events	63 (85.1)	41 (64.1)		

[1] Some respondents reported more than one life event in each cluster. The figures represent the number of individuals with at least one of the relevant type of life event.
[2] Pearson's χ^2 test with Yates's correction was used. Where a χ^2 value is not indicated, the reported significance value was based on Fisher's Exact Test Statistic.
* Statistically significant association.

In summary, cases had experienced more life events than controls, although many of the observed differences did not reach statistical significance. Out of all 64 life events items, cases had experienced 54 (84.4%) compared to 38 (59.4%) of controls.

Using a 2-independent sample Mann–Whitney *U*-test, differences in life events in the two groups were not significant. Overall, cases had a higher mean number of life events (6.49; SD = 7.42) compared to controls (4.39; SD = 3.34) (mean rank among cases = 72.16 and that of controls = 66.42; Mann–Whitney $U = 2171$; $p = 0.392$), as shown in Table 6. An exception was that among cases, the single by marital status reported significantly fewer life events than the non-single (mean rank of single = 29.79, median = 0.00, range = 0–16; mean rank of non-single = 40.56, median = 6.00, range = 0–32, Mann–Whitney $U = 39.5$, $p = 0.048$). However, cases reported more independent life events. Life events also had significantly more negative impact ratings on cases compared to controls.

DISCUSSION

In this study, we set out to compare life events experienced by a sample of patients with a current MDE attending PHC centres and healthy community controls in central Uganda. Our findings show a predominance of life events among patients with a current MDE, which is generally consistent with previous African studies (Broadhead *et al.*, 2001; Broadhead & Abas, 1998; Ndetei & Vadher, 1982; Patel *et al.*, 1997). The relationship between life events and current MDEs was modified by gender, educational attainment and regularity in earning income.

Females formed the majority of the sample and reported experiencing more life events than males. However, they seemed to be more protected against a current MDE. This is different from findings in studies elsewhere which report either modest or no gender differences (Christensen *et al.*, 2003; Ohaeri & Otote, 2002; Patel *et al.*, 1997). This trend was also observed in a study

Table 6
Mann–Whitney *U*-test for scaling of life events among depressed patients versus healthy community controls

Assessments of life events	Type of study participant							
	Depressed patients (cases) (n = 74)			General population (community) controls (n = 64)				
	Mean (SD)	Median (range)	Mean rank	Mean (SD)	Median (range)	Mean rank	Mann–Whitney *U*	*p* value
Number of life events (average)	6.49 (7.42)	5.50 (0–32)	72.16	4.39 (3.34)	5.00 (0–11)	66.42	2171	0.392
[1] Independent life events	1.72 (2.36)	1.00 (0–12)	80.70	0.47 (1.05)	0.00 (0–5)	56.55	1539.5	< 0.001
[1] Dependent life events	4.77 (6.38)	3.00 (0–30)	67.18	3.92 (3.01)	4.00 (0–11)	72.19	2196	0.454
[2] Undesirable life events	4.24 (4.59)	3.00 (0–18)	73.91	2.58 (1.99)	3.00 (0–6)	64.41	2042	0.155
[2] Desirable life events	1.49 (1.98)	1.00 (0–9)	68.47	1.45 (1.64)	1.00 (0–6)	70.69	2292	0.732
[3] Negative impact of the events	4.53 (6.36)	2.00 (0–28)	76.56	1.63 (1.82)	1.00 (0–8)	61.34	1845.5	0.021
[3] No negative impact	1.82 (2.19)	1.00 (0–9)	63.80	2.77 (2.81)	2.00 (0–9)	76.09	1946	0.063

[1] Independence/dependence of a life event was assessed on a scale ranging from; (1) event was almost certainly independent of illness; (2) event was probably independent of illness; (3) rater uncertain as to independence or dependence of event; (4) event probably dependent on illness, to (5) event certainly dependent on the illness. Independence of the life event referred to a score of (1) and (2), while the remaining scores referred to a dependent life event.

[2] Desirable/undesirable life events were determined at data analysis stage, whereby life events were divided into non-overlapping groups, based on event definition rather than each occurrence. Ambiguous events (where it was difficult to determine desirability) were excluded (E.S. Paykel *et al.*, 1980).

[3] Objective negative impact of a life event was assessed on a scale ranging from: (1) severe negative impact; (2) marked negative impact; (3) moderate negative impact; (4) mild negative impact, to (5) no negative impact. 'Negative impact' referred to a score of (1), (2) and (3) while the remaining score referred to 'no negative impact'.

from Zimbabwe which showed that male cases experienced more sicknesses in family members as a life event (Patel *et al.*, 1997). Culturally, men do not verbalise their suffering and are unlikely to seek help for emotional problems (Alexander, 2001). This is not uncommon in many African societies where men do not usually talk about their personal and private stressful issues, while women share theirs with mostly female friends. Second, most respondents reported work-related life events which apply more to men in much of Uganda, since they are more likely to be in formal employment while women are over-represented in the informal peasant sector.

Life events such as business failure, retirement, menopause, moving to another country, legal problems, a child leaving home, arguments with non-family members and divorce settlements rarely applied to our respondents. This is a reflection of their unsophisticated lifestyles as noted in a paper by Ndyanabangi *et al.* (2004). Second, our respondents' education levels were modest. Thus, the rate of formal employment was low, implying that life events relating to paid work, education, finances and migration were few. Nevertheless, patients with a current MDE reported significantly more life events related to work, notably job changes, changes in working hours and conditions, and job losses.

It is important to note that most life events reported by depressed patients were related to losses in a family context. Paykel (1994) had observed a preponderance of loss events among the depressed. Depressed respondents had lost more in relationships, especially difficulties with fiancées or sexual partners, arguments with resident family members, and marital problems or problems of close family members. This is consistent with other studies that documented such losses as risk factors for affective disorders (Birabwa, 2005; Christensen *et al.*, 2003; Leskela *et al.*, 2004; Rahamn *et al.*, 2003; Schmidt *et al.*, 2004). Unexpectedly, we found marked improvements in relationships with family members and/or close friends and marital reconciliation among the depressed patients. This may be explained by the culturally sanctioned family support that is rendered to family members considered ill irrespective of the illness, as found in many African societies. Conversely, improved relationships presuppose a preceding strain. Besides, Ndetei and Vadher (1982) had observed that the meaning of each life event is influenced by the cultural context in which it appears.

Similar to other studies (Patel *et al.* 1997; Rafanelli *et al.* 2005), our study shows that depressed patients experienced more life events than community controls in a period of six months before the interview date. Generally, we found that life events significantly had more negative impact ratings among the depressed. This was also consistent with earlier findings from the region (Birabwa, 2005; Ndetei & Vadher, 1984). Similar to other studies, we found that independent life events were associated with MDEs in our respondents (Christensen *et al.*, 2003; Paykel, 2003). Significant independent life events faced by depressed patients were clustered around work, health, bereavement and marriage. This may be a reflection of socio-economic stressors that are common in low-income societies, which render coping with illness, bereavement and even positive experiences like marriage that need money difficult. Second, work, education, health and courtship/cohabitation events had more negative impact ratings on depressed patients. In spite of the buffer provided by the family, the cost of living in many Ugandan communities as reflected in education, health and sustaining relationships is high (Uganda Bureau of Statistics (UBOS) & ORC Macro, 2006). The situation may be more precarious for depressed patients who were found to have a higher risk of being jobless and therefore having financial difficulties.

There are inherent methodological weaknesses with retrospective studies like this one. The validity of such a case–control study depends on accuracy in definition of cases and controls and the extent to which the design or analysis controls for biases (Breslow & Day, 1980). To minimise

misclassification, we used a clear definition of a current MDE (American Psychiatric Association, 2000; Sheehan & Lecrubier, 1998). Another weakness could have been distortion in recall whereby patients, given their sick role, might have attempted to report more life events. Their recall could have been influenced by their depressive symptoms. They might have tried to assign more negative meaning to life events so as explain their depressive illness. To minimise such risks, we systematically guided respondents to recall pre-defined life events. Interviewers had to carry out detailed enquiries to exclude events outside the specified period and those that were likely to be consequences of illness, and to do the rating. Unlike self-rating scales, observer-rated instruments like IRLE has the ability to facilitate temporal organisation of personal facts (Barrata *et al.*, 1985; Paykel, 1997).

While precision in dating of the onset of the index depressive disorder is one good way of assessing independence of the life event, this was not possible given the modestly schooled respondents in the study. Patients cared more about their perceived physical well-being at the time of the interview and not the precise dating of when their mood began to deteriorate. Second, patients presented somatic complaints at PHC centres, probably reflecting the typical somatic presentation of depression as observed by Taylor and Mann (1999). Not all respondents could reliably recall when their depressive symptoms began to make it possible for proper dating of events. Interview questions had to be anchored to historical and public events to facilitate recall. Another problem was the difficulty to determine whether controls had sought help from health centres days or weeks before the interview date. For a control to be included, interviewers had to establish that this had not happened in the six-month period preceding the interview.

The relatively small sample size limits us from generalising to the entire population and might have limited the power of our tests. For instance, in assessing independence, negative impact and occurrence, cases differed significantly from controls but the probability of having chance findings for some life event clusters was high, as reflected in wide confidence intervals and shrinking strata sample sizes. Data collected from three health centres may not be representative of all PHC centres, particularly in central Uganda or the whole of Uganda. However, our sample size is comparable to other related studies (Broadhead *et al.*, 2001; Ndetei & Vadher, 1982; Ohaeri & Otote, 2002; Rafanelli *et al.*, 2005). This makes our findings comparatively credible.

Matching would have ensured that our cases and controls would be similar on all variables except life event exposure, which was of interest in the study. Since we did not match cases to controls, the variability might have become part of the unexplained variation hence obscuring important differences. We did no individual case-to-control matching, thereby avoiding the limitation of only using cases for which we were able to get controls. Moreover, cases presented at PHC centres with differing somatic complaints and illnesses. Second, matching on certain variables could have limited our ability to raise controls. We did not use other PHC attendees as controls in this study given their unsuitability since their medical condition may have been contributed to by life stress as suggested by Paykel (1994). However, community controls may have caused a selection bias since cases and controls differed on the current MDE diagnosis, hence health-seeking behaviour. Cases had gone to PHC centres to seek for help, while controls had not. Though exclusion of some respondents in the control group from further analysis due to missing data could have potentially altered the strength and nature of observed associations, they were randomly distributed in the sample hence minimising the selection bias. Meekly, we present the findings aware that associations of life events and current MDEs did not prove a causal linkage.

By allowing interviewers to rate the occurrence, independence and negative impact of life events, methodological complexities related to distortions in response interpretation might have occurred. We tried to solve this by using a well-developed and systematic face-to-face data collection

approach, which has been shown to be reliable, especially in defining life event entities and how to assess them (Brown *et al.*, 1987; Paykel, 1997). Second, for life events that were not easy to assess, interviewers took detailed notes and reported to the fieldwork team of four people who collectively rated the three aspects of measurement. Prior definition of life event items improved inter-rater reliability. To control distortions, ensure adherence to predefined life events and guard against loss of precision in measurement through ignoring valuable data, the primary investigator dedicatedly supervised fieldwork.

A clear strength of this study was the use of face-to-face interviews with IRLE, an instrument designed to follow that format in a context where most respondents were either semi-literate or illiterate. Besides, the IRLE prescribes a careful probing interview style to assess the objective negative features rather than merely the subjective ones. The act of asking respondents similar questions by research assistants who were unaware of the underlying study questions minimised information bias. Though it is possible that depressed patients selectively remembered more upsetting events, like those concerning their health status compared to controls, this was less likely since even patients were not aware of their depressive illness. Though a non-patient sample would have been an ideal control group (Paykel, 2003), due to an advantage of not being biased by help-seeking behaviour, the study is justified given absence of documented differences between depressed patients at PHCs and comparable community members in Uganda.

Research instruments used in this study were developed in other cultures and are yet to be validated in Uganda's multicultural setting. However, a consistent adaptation approach was employed, taking into account cultural differences. This included translation of all instruments into Luganda and blind back-translation to English in a way that ensured conceptual equivalence, cultural sensitivity and validity. Trained Luganda speakers carried out interviews and ratings (Muhwezi *et al.*, 2007).

CONCLUSION

We found that life events were more common among depressed patients at PHCs compared to normal healthy people in the community. Two life events, namely, health/illness events and family events, were the most common among depressed patients. Good neighbourliness and harmony in the family and community seemed to be very important to our study group. Loss arising from strained relationships appeared to be very stressful. Experience of personal illness, injury or accident was high among the depressed and this was not surprising since they were patients seeking care at health centres. Though the IRLE lacked important cultural events in our setting, like funeral rites, visitation by traditional healers, baptismal and betrothal functions, it still emerged as a relevant cross-cultural tool in this life events study.

Depressed patients reported significantly more independent life events, which were mainly clustered around work, health, bereavement and marital relations. Life events also had profound negative impact ratings on depressed patients. However, stating any causal association between life events and depression as seen at PHC centres is complicated and merits more research, where rigorous control of other potential confounders and effect modifiers should be done. Nevertheless, our findings identified stressful life events that were associated with depression at PHC centres, which should be taken as cues for psychosocial interventions like counselling.

It is noteworthy that depressed patients at PHC centres had gone there to seek treatment for somatic and not psychological complaints. Since so many of them were found to have depression

underscores the importance of screening for depressive disorders at PHCs (Muhwezi *et al.*, 2007). Second, the reality of stressful life events being prevalent among depressed patients at PHC centres calls for more mental health workers to be trained and deployed in crisis centres in communities to provide psychotherapeutic services that lessen escalation of distress and promotion of coping. It also calls for training of informal helpers (traditional healers, village elders, teachers, community health workers and members of religious communities e.g. clergy, catechists, mullahs etc.) to augment counselling given by mental health workers. Compared to the lengthy training needed to produce professional mental health workers, research from Uganda suggests that informal helpers can be trained to be effective counsellors in a shorter period of time (Kabura *et al.*, 2005).

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