Relationships between quality of life, spiritual well-being, and psychological adjustment styles for people living with leukaemia: An exploratory study

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Relationships between quality of life, spiritual well-being, and psychological adjustment styles for people living with leukaemia: An exploratory study

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Abstract
This paper reports on the relationships between quality of life, spiritual well-being, and psychological adjustment styles for people living with leukaemia. Participants were 40 adults (26 women and 14 men) aged between 22 and 80 years living with acute or chronic leukaemia in Western Australia. Participants completed three scales measuring spiritual well-being (FACIT-Sp-12-C Version 4; Cella, 1997), psychological adjustment styles (MAC; Watson, Greer, & Bliss, 1989), and quality of life (FACIT-G; Cella, 1997). No differences were found between the men and women participants, with the exception of the anxious preoccupation adjustment style. Significant positive correlations were found between spiritual well-being and quality of life ($r = 0.72$, $p < 0.01$), and between fighting spirit and both spiritual well-being ($r = 0.55$, $p < 0.01$) and quality of life ($r = 0.67$, $p < 0.01$). Spiritual well-being and quality of life were both significantly negatively correlated with hopelessness/helplessness, fatalism, and anxious preoccupation, suggesting that people who are able to find meaning in their illness are more likely to utilize functional psychological adjustment styles. A stepwise multiple regression revealed that spiritual well-being was most strongly associated with quality of life for people living with leukaemia, followed by a fighting spirit; together, these accounted for 61% of the variance in quality of life scores. Thus, having a reason for living, making life more productive, finding comfort in faith or spiritual beliefs, being determined to control the environment, and feeling a sense of meaning, peace, harmony, purpose, and comfortable in oneself are factors that contribute to a better quality of life among patients with leukaemia. Strengths, limitations, and implications of the findings are discussed.
Introduction

Leukaemia is a blood-related cancer that originates in the bone marrow and is characterized by the uncontrollable growth of developing marrow cells (D’Antonio, 2004). Although leukaemia is a neoplasm, it affects the blood and blood-forming organs and is thus often referred to as a blood disorder (Brown, Mulhern, & Simonian, 2002). In fact, the term leukaemia describes a group of malignancies and comes from a Greek word meaning “white blood”. The disease is often referred to as cancer of the blood. The lifetime risk of developing leukaemia is one in three for Australian males and one in four for Australian females (Australian Institute of Health and Welfare, 2000).

Treatments for leukaemia such as chemotherapy, radiation, and bone-marrow transplantation are invasive and painful, and create side effects including fatigue, nausea, vomiting, and auto-immune responses (Brown et al., 2002; D’Antonio, 2004; McGrath, 2004; Molassiotis & Morris, 1999; Xuereb & Dunlop, 2003), some of which are potentially life-threatening. Indeed, the physical effects of the procedures and treatments are often considered to be worse than the leukaemia symptoms (McGrath, 2004).

Patients with leukaemia and their families face many difficulties and challenges as a result of their diagnosis and treatments. In addition to the physical effects, patients also report that treatments result in psychological distress characterised by poor concentration and cognitive changes (Valentine & Meyers, 2001), feelings of helplessness (Perry, 2000), fear (Xuereb & Dunlop, 2003), depression and anxiety (Courneya, Keats, & Turner, 2000; Poulos, Gertz, Pankratz, & Post-White, 2001), and a marked deterioration in body image and sexual functioning caused by the side effects of treatments (Isikhan et al., 2001; Xuereb & Dunlop, 2003). Associated social factors include loss of employment, financial problems, social withdrawal, and family difficulties, and some patients and their families have to cope with the additional burden of geographical relocation from regional areas in order to receive specialist care in cities (McGrath, 2001). These changes singularly, or in combination, may adversely affect the patient’s general quality of life. Attempts at maximizing the quality of life for people living with leukaemia are gaining increasing attention as improvements in diagnosis and treatments have resulted in more people living longer with the disease (Australian Institute of Health and Welfare, 2000; Lewis, 2002).

Quality of life and leukaemia

Quality of life is a multidimensional construct that includes physical, functional, emotional, and social well-being (Aaronson et al., 1993). In recent years, quality of life has been a focus of research interest in oncology. For example, there have been psychosocial guidelines developed for women living with breast cancer (National Health and Medical Research Council, 2000), which encompass clinical practice guidelines and reflect the psychosocial impact of breast cancer on women and their families. However, there is a paucity of quality-of-life research
that focuses on leukaemia or associated haematological disorders (Gaston-Johansson & Foxall, 1997) despite results from recent empirical studies demonstrating that leukaemia patients report a lower quality of life than matched controls (Holzner et al., 2004). A lower quality of life is associated with psychological distress and, hence, being less able to accept the reality of disease (Isikhan et al., 2001). It also impacts negatively on sexual relationships, vocational and social adjustment, and psychological coping (Molassiotis & Morris, 1999).

Some of the underlying reasons for a lower quality of life include the inability to maintain normalcy in everyday life and a decrease in independence. This leads to less enjoyment and fulfilment from life and a general decrease in health for the individuals concerned. Quality of life is also negatively affected by concerns regarding a recurrence of the disease, long-term effects of the transplant, financial concerns, and infertility (Molassiotis & Morris, 1999).

Psychological adjustment styles have emerged from the literature as a key predictor of quality of life for people living with cancer, and therefore, it is prudent to undertake further research to examine their role in terms of predicting outcomes for leukaemia patients (Andersen, 2002).

**Psychological adjustment and cancer**

Psychological adjustment is the manner in which patients with chronic illness, including leukaemia, cope with their disease (Nordin, Berghlund, Terje, & Glimelius, 1997; Young, Cashwell, & Schcherbakova, 2000). Adjustment comprises cognitive, behavioural, and emotional responses (Greer & Watson, 1987), and these are inter-related. For example, patients' understanding and perceptions of their illnesses affect their emotional reactions and also their levels of depression and anxiety (Watson et al., 1991).

People develop a range of strategies for dealing with anxiety and stress and coping with the diagnosis of cancer (Cancer Foundation of Western Australia, 1998) with certain psychological adjustment styles appearing more effective than others. For example, there appears to be an association between the tendency to control emotional reactions and a fatalistic attitude toward cancer (Watson et al., 1991). Low “fighting spirit” scores and high “helpless/hopeless” scores, as measured by the Mental Adjustment to Cancer Scale (MAC; Watson, Greer, & Bliss, 1989), are correlated with higher levels of anxiety and depression in patients with leukaemia and lymphoma (Montgomery, Pocock, Titley, & Lloyd, 2003). Equally, a high fighting spirit score is associated with an increased length of survival for people with cancer (Cancer Foundation of Western Australia, 1995; Tschuschke et al., 2001). Using the same scale to measure psychological adjustment styles, Cotton, Levine, Fitzpatrick, Dold, and Taro (1999) found that higher fighting spirit scores predicted a positive attitude towards life, mediated the negative impact of treatments, and led to a sense of hopefulness and looking forward to the future.
In the search for additional factors that contribute to improving quality of life, recent research has highlighted the potential role of spirituality as a buffer to the experience of leukaemia and as a potential predictor of quality of life. In a review, Breitbart (2001) found that spiritual well-being is associated with a higher quality of life and a greater ability to endure physical symptoms of illness, and acts as a buffer against depression, loss of hope, and desire for death.

**Spiritual well-being and leukaemia**

The role of spirituality in coping with chronic illness is gaining interest within health care domains; however, there are many interpretations of spirituality within these settings (Daalman, Cobb, & Frey, 2001; Dein & Stygall, 1997; Flannelly, Weaver, & Costa, 2004; McGrath, 2004; Rumbold, 2003). Rumbold (2003) argued that spirituality is personal and unique, and might encompass religion for some individuals, but not for others. In essence, religious people are likely to be spiritual, but spiritual beliefs may or may not be religious in nature (Speck, Higginson, & Addington-Hall, 2004). Recent empirical research has demonstrated the distinction between religiosity and spirituality. For example, a qualitative study undertaken by Murray, Kendell, Boyd, Worth, and Benton (2004) found that patients with life-threatening illnesses construct religiosity and spirituality differently, with spirituality being defined as incorporating meaning, purpose, love, and transcendence.

Narayanasamy (2004) argued that, along with prayer to God, spirituality also encompassed meaning, purpose, and connections with others. McGrath (2004) echoed this argument by defining spirituality as the process of meaning-making, and that it is distinct from religiosity. She interviewed 12 non-religious Australian survivors of haematological malignancies, including leukaemia, on their meaning-making during and following their illnesses and reported that the participants’ meaning-making journey began at the time of diagnosis. Some immediately had a frame of reference for meaning (e.g., things happen for a reason), while for others, the meaning-making framework developed over time. The respondents stated that their spiritual journeys provided reassurance, helped them to take responsibility for their illness, and assisted them in viewing life in a positive manner. Some stated that having cancer was too difficult to deal with alone, and therefore they needed to assign meaning to their disease in order to cope.

When there is a perceived gap between patients’ expectations of, and the reality of, their illness, patients are likely to report spiritual distress. Kawa et al. (2003) have conceptualized this distress into three distinct types. The first is an awareness of a gap between how patients wanted to live their lives and the reality of their lives, with an emphasis on the loss of autonomy and independence. The second concerned the gap between how the patients wished to die and the likely reality of their deaths. The patients highlighted the need to die gracefully, calmly, easily, and without being a burden on others. The third form of spiritual distress concerned the increasing difficulty of maintaining relationships with their loved ones. The researchers reported that these forms of spiritual distress were
exacerbated by the presence of severe physical symptoms. Lesho (2003) conceptualized suffering as the absence of spiritual well-being and argued that suffering is exacerbated by nausea, depression, disfigurement, loss of function, perception of becoming a burden on others, and physical pain, all of which are commonly experienced by people with leukaemia.

Relationships between spiritual well-being, psychological adjustment, and quality of life

Spiritual well-being has been found to act as a buffer against hopelessness, suicidal ideation, and the desire for a hastened death (McClain, Rosenfeld, & Breitbart, 2003). It is related to quality of life among patients with cancer and blood-related disorders (Brady, Peterman, Fitchett, Mo, & Cella, 1999) and is associated with requiring less medical care for physical symptoms (Rhodes & Kristeller, 2000).

In research with patients with breast cancer, Cotton et al. (1999) investigated the relationships between spiritual well-being, psychological adjustment styles, and quality of life, and reported positive correlations between spiritual well-being and quality of life and between quality of life and the psychological adjustment style of a fighting spirit. These researchers also found significant correlations between spiritual well-being and fighting spirit, negative correlations between quality of life and the use of a helpless/hopeless adjustment style, and a positive correlation between quality of life and fatalism. However, surprisingly, results demonstrated that spiritual well-being contributed very little to quality of life among breast-cancer patients after accounting for other variables such as psychological adjustment and demographic variables.

There is a dearth of research exploring the relationships between spiritual well-being, psychological adjustment, and quality of life in the leukaemia context. Indeed, a search of the literature revealed that no study has examined the relationships between these three variables for people living with leukaemia. The research reviewed above indicates that spiritual well-being and psychological adjustment styles are both related to quality of life for people with cancer. It is thus anticipated that spiritual well-being, along with psychological adjustment style, will be associated with the quality of life for people living with leukaemia.

Aims and research questions

This study explored the relationships between spiritual well-being, quality of life, and psychological adjustment in patients with leukaemia and addressed the following questions:

(1) Are there any significant relationships between spiritual well-being, psychological adjustment styles, and quality of life in the context of adults living with leukaemia in Western Australia?

(2) Which of these variables (psychological adjustment styles/spiritual well-being) is most strongly associated with quality of life for adults living with leukaemia in Western Australia?
Method

Research design

A cross-sectional correlational design was used to answer the research questions. Adults with leukaemia were asked to complete three scales that measured their spiritual well-being, psychological adjustment, and quality of life.

Participants

The sample consisted of 40 adult patients with both acute and chronic leukaemia, living in Western Australia. All were able to complete the questionnaires in English. The sample consisted of 26 women (65%) and 14 men (35%) whose ages ranged from 22 to 80 years ($M = 49.20$ years, $SD = 12.97$). At the time of the study, the participants had been living with leukaemia for an average period of 3.11 years ($SD = 2.14$), ranging from 6 months to 12 years.

Instruments

The participants completed three questionnaires that measured spiritual well-being, psychological adjustment, and quality of life, and demographic questions to determine age, gender, and time since diagnosis.

Spiritual well-being was measured via the Functional Assessment of Chronic Illness Therapy—Spiritual Well-being Scale (FACIT-Sp-12-C Version 4; Cella, 1997). The scale is widely used in cancer research (Andersen, 2002; Breitbart, 2001), consists of 12 items that focus on the existential aspects of spirituality and faith, and has two sub-scales. The first consists of eight items focusing on meaning/peace, and the second has four questions on faith. Each item is rated on a 5-point likert-type scale according to its relevance for the respondent during the past 7 days, from “not at all” to “very much.” Items include issues such as having a reason to live, finding a purpose or meaning in one’s life, finding strength or comfort in one’s faith, and the effect the illness has on one’s faith. The internal consistency for the overall FACIT-Sp-12-C Version 4 has been established using Cronbach’s alpha as 0.87 by Cella (1997). Internal consistency reliability has been reported as a Cronbach alpha of 0.81 for meaning and peace items, and 0.88 for faith items (Brady et al., 1999).

Psychological adjustment was measured with the Mental Adjustment to Cancer Scale (MAC; Watson et al., 1989). Specifically, the scale assesses the different psychological adjustment styles: Fighting Spirit, Fatalism, Helpless/Hopeless, Anxious Preoccupation, and Cognitive Avoidance. The 40 items are rated on a 4-point scale ranging from (1) “definitely does not apply to me,” to (4) “definitely applies to me.” Internal consistency and reliability for the subscales ranges from 0.65 to 0.84 (Watson et al., 1989), and the MAC has been validated on samples of cancer patients in many countries (Cotton et al., 1999).

Quality of life was assessed via the Functional Assessment of Chronic Illness Therapy—General Scale (FACIT-G; Cella, 1997). The scale is a 27-item general version of the FACIT scale and measures four areas of quality of life: physical...
well-being, social/family well-being, emotional well-being, and functional well-being. As reported in Cotton et al. (1999) the FACIT-G has an internal consistency rating of 0.89, and test–retest reliability coefficients ranging from 0.82 to 0.92.

**Procedure**

The study was approved by the ethical committees of Edith Cowan University and Sir Charles Gairdner Hospital. Participants were recruited using flyers from two centres: the Haematology Care Centre within Sir Charles Gairdner Hospital located in central Perth, Western Australia, and the Leukaemia Foundation of Western Australia, which supports people living with leukaemia. Participants were also invited to participate through information about the research published in community newspapers. Participants indicated their interest in the study by contacting the researcher, who then mailed information on the study including informed consent and confidentiality, a set of questionnaires, and a self-addressed, stamped envelope to return the completed questionnaires. The completion of the questionnaire indicated consent to participate in the study.

**Data screening**

Data were analysed using SPSS for Windows version 11.5. Prior to analysis, quality of life, spiritual well-being, overall psychological adjustment, and the five psychological adjustment styles (fighting spirit, helpless/hopeless, fatalism, anxious preoccupation, and cognitive avoidance) were examined for missing values and the match between the data and the assumptions for analysis. No cases of missing data were identified. Three univariate outliers were identified via the inspection of box plots. All univariate outliers were brought closer to the mean by substituting their value for the next highest or lowest value that was not an outlier (Tabachnick & Fidell, 1996).

Due to low sample size, it was important to determine that there were no differences between males and females in order to justify their combination into one group. To investigate whether or not there were any differences in scores between the men and women participants, comparisons were performed on quality of life, spiritual well-being, overall psychological adjustment, and the five psychological adjustment styles. This was important, given that recent studies have identified gender as a predictor of leukaemia outcome (e.g., Akaho et al., 2003) and of quality of life (e.g., Holzner et al., 2004).

Eight univariate outliers were identified when male and female data were separated. There were seven outliers for the women on the anxious preoccupation scale, with six being extreme high scores and one being an extreme low score. One extremely low score was identified in the male scores for fatalism. As above, all univariate outliers were brought closer to the mean by substituting their value for the next highest or lowest value that was not an outlier (Tabachnick & Fidell, 1996).
Despite the small and uneven sample sizes between the men ($n=14$) and women ($n=26$), the assumption of homogeneity of variance was not violated. However, most of the distributions of variables by gender violated the assumption of normality, with the exception of spiritual well-being for men, quality of life for men, fighting spirit for men, and psychological adjustment for both men and women. Hence, only the psychological adjustment scores were suitable for parametric analysis. As such, an independent samples $t$-test was performed on psychological adjustment scores, revealing no statistical difference in the psychological adjustment between the men ($M=108.71$, $SD=4.71$) and women ($M=107.65$, $SD=5.87$), $t(38)=58$, $p=0.56$. All other scores between men and women were analysed using the Mann–Whitney $U$ Test. The tests demonstrated no significant differences in the scores between men and women on overall quality of life, spiritual well-being, fighting spirit, helpless/hopeless, cognitive avoidance, and fatalism. The scores between men and women on the anxious preoccupation subscale were significantly different (see Table I).

Based on the independent $t$-test and Mann–Whitney $U$ comparisons, the data for men and women were grouped for subsequent analyses. A reliability analysis, via the calculation of Cronbach’s alpha, was performed to determine the internal consistency of the three scales. Cronbach’s alpha for the FACIT-Sp-12-C Version 4 (Cella, 1997) was 0.89, which is consistent with that reported by Cella (1997). The MAC (Watson et al., 1989) revealed an overall Cronbach’s alpha of 0.62. Cronbach’s alpha for the FACIT-G (Cella, 1997) was 0.90.

**Results**

Bivariate Pearson product-moment correlations were calculated in order to determine the relationships between spiritual well-being, quality of life, psychological adjustment, and its subscales. The data revealed a number of statistically significant correlations among the variables (see Table II).

The strongest correlation was between spiritual well-being and quality of life ($r=0.72$, $p<0.01$) indicating that a higher spiritual well-being is associated with

<table>
<thead>
<tr>
<th>Variables</th>
<th>Women M rank</th>
<th>Women Sum of ranks</th>
<th>Men M rank</th>
<th>Men Sum of ranks</th>
<th>Mann–Whitney $U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being</td>
<td>22.12</td>
<td>575.00</td>
<td>17.50</td>
<td>245.00</td>
<td>140.00</td>
<td>0.23</td>
</tr>
<tr>
<td>Quality of life</td>
<td>21.63</td>
<td>562.50</td>
<td>18.39</td>
<td>257.50</td>
<td>152.50</td>
<td>0.40</td>
</tr>
<tr>
<td>Fighting spirit</td>
<td>21.12</td>
<td>549.00</td>
<td>19.36</td>
<td>271.00</td>
<td>166.00</td>
<td>0.65</td>
</tr>
<tr>
<td>Hopeless/helpless</td>
<td>18.96</td>
<td>493.00</td>
<td>23.36</td>
<td>327.00</td>
<td>142.00</td>
<td>0.25</td>
</tr>
<tr>
<td>Fatalism</td>
<td>19.94</td>
<td>518.50</td>
<td>21.54</td>
<td>301.50</td>
<td>167.50</td>
<td>0.67</td>
</tr>
<tr>
<td>Anxious preoccupation</td>
<td>17.31</td>
<td>450.00</td>
<td>26.43</td>
<td>370.00</td>
<td>99.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Cognitive avoidance</td>
<td>20.31</td>
<td>528.00</td>
<td>20.86</td>
<td>292.00</td>
<td>177.00</td>
<td>0.88</td>
</tr>
</tbody>
</table>

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better quality of life. There were no significant correlations between the overall psychological adjustment score and spiritual well-being ($r = -0.02, p > 0.05$) or psychological adjustment and quality of life ($r = 0.19, p > 0.05$) and thus an examination of particular sub-scales proved more useful.

Of the psychological adjustment subscales, fighting spirit was significantly positively correlated with spiritual well-being ($r = 0.55, p < 0.01$) and quality of life ($r = 0.67, p < 0.01$). The hopeless/helpless style was significantly negatively correlated with spiritual well-being ($r = -0.48, p < 0.01$) and quality of life ($r = -0.34, p < 0.05$). Fatalism was significantly negatively correlated with spiritual well-being ($r = -0.63, p < 0.01$) and quality of life ($r = -0.43, p < 0.01$). Anxious preoccupation was significantly negatively correlated with spiritual well-being ($r = -0.58, p < 0.01$) and quality of life ($r = -0.57, p < 0.01$). Thus, higher levels of fatalism, anxious preoccupation, and hopeless/helpless adjustment styles were related to lower levels of both spiritual well-being and quality of life. Cognitive avoidance was negatively correlated with both quality of life and spiritual well-being, but these relationships were not statistically significant.

Many of the psychological adjustment subscales were correlated with one another. Fatalism was significantly positively correlated with the hopeless/helpless adjustment style ($r = 0.69, p < 0.01$), but was significantly negatively correlated with fighting spirit ($r = -0.48, p < 0.01$). Anxious preoccupation was significantly negatively correlated with fighting spirit ($r = -0.33, p < 0.05$). Anxious preoccupation was positively correlated with both fatalism and hopeless/helpless style, but neither relationship reached statistical significance. Cognitive avoidance was significantly positively correlated with hopeless/helpless ($r = 0.78, p < 0.01$)

<table>
<thead>
<tr>
<th></th>
<th>Quality of life</th>
<th>Spiritual well-being</th>
<th>Psychological adjustment</th>
<th>Fighting spirit</th>
<th>Hopeless/helpless</th>
<th>Fatalism</th>
<th>Anxious preoccupation</th>
<th>Cognitive avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life</td>
<td>0.72**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiritual well-being</td>
<td>0.19</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>0.67**</td>
<td>0.55**</td>
<td>0.48**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adjustment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fighting spirit</td>
<td>-0.34*</td>
<td>-0.48**</td>
<td>0.51**</td>
<td>0.13</td>
<td>-0.33*</td>
<td>0.07</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Hopeless/helpless</td>
<td>-0.43**</td>
<td>-0.63**</td>
<td>0.33*</td>
<td>-0.48**</td>
<td>0.69**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatalism</td>
<td>-0.57**</td>
<td>-0.58**</td>
<td>0.13</td>
<td>-0.33*</td>
<td>0.07</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious preoccupation</td>
<td>-0.10</td>
<td>-0.21</td>
<td>0.65**</td>
<td>0.04</td>
<td>0.78**</td>
<td>0.49**</td>
<td>-0.39</td>
<td></td>
</tr>
<tr>
<td>Cognitive avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**$p < 0.01$; *$p < 0.05$.**
and fatalism \((r = 0.49, \ p < 0.01)\). Cognitive avoidance was also negatively correlated with anxious preoccupation, but this relationship did not reach statistical significance. The hopeless/helpless style was negatively correlated with fighting spirit, but the relationship was not statistically significant.

A stepwise multiple regression was performed between quality of life as the criterion variable with spiritual well-being and fighting spirit as the predictor variables. Due to the sample size \((n = 40)\), only two predictor variables were selected for analysis. The two predictor variables were the most highly correlated variables with quality of life.

The assumptions of independence, normality, linearity, and homoscedasticity were tested via the inspection of the residual scatter plot, which revealed that the assumptions were not violated. No incidents of singularity or multicollinearity \((r > 0.90)\) were identified (see Table II). With the use of a \(p < 0.001\) for Mahalanobis distance, no multivariate outliers among the cases were identified, so data from all participants were included in the final analysis.

Table III displays the correlations between variables, unstandardized regression coefficient \((B)\) and intercept, standardised regression coefficients \((\beta)\), semi-partial correlations \((sr_i^2)\), \(R^2\), adjusted \(R^2\) and, change in \(R^2\). \(R\) for regression was significantly different from zero, \(F(2, 37) = 31.55, \ p < 0.001\). The data indicate that 61\% of the variance in quality of life can be accounted for by a model including spiritual well-being and a fighting spirit. The statistical regression identified that fighting spirit contributes a significant increase (10\%) to the total variance, \(F(1, 37) = 9.88, \ p < 0.005\), beyond that contributed by spiritual well-being alone; therefore, a model that includes both spiritual well-being and fighting spirit was the best model in determining quality of life in this sample.

**Discussion**

This study demonstrated a significant positive relationship between spiritual well-being and quality of life for people living with leukaemia. Higher spiritual

<table>
<thead>
<tr>
<th>Variables</th>
<th>Quality of life</th>
<th>Spiritual well-being</th>
<th>(B)</th>
<th>(\beta)</th>
<th>(sr_i^2) (unique)</th>
<th>Change in (R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiritual well-being</td>
<td>0.73</td>
<td>0.85**</td>
<td>0.52</td>
<td>0.43</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Fighting spirit</td>
<td>0.67</td>
<td>0.56</td>
<td>1.13**</td>
<td>0.31</td>
<td>0.10*</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>(-6.32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(M)</td>
<td>81.95</td>
<td>33.98</td>
<td>52.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(SD)</td>
<td>13.81</td>
<td>8.46</td>
<td>4.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(R^2 = 0.63\)

Adjusted \(R^2 = 0.61\)

\(R = 0.79**\)

\(*p < .001; \ *p < 0.005.\)
well-being scores were associated with higher quality-of-life scores. Essentially, those who perceived meaning and purpose in their lives had an optimistic outlook on the experience of the illness and a strong faith towards betterment of their lives, which in turn contributed to a better quality of life.

With the exception of cognitive avoidance, this study also highlighted significant relationships between the psychological adjustment styles with both quality of life and spiritual well-being. The strongest relationship was a positive correlation between fighting spirit and quality of life, suggesting that people who have positive attitudes tend not to dwell on their illness. Instead, they make time for themselves and think of other people who are worse off than themselves. These characteristics, in addition to fighting spirit qualities found in patients who have a daily schedule, view their illness as a challenge, want to fight their illness, and believe in getting better are better prepared to manage living with their illness, contribute to a higher quality of life.

Both the helpless/hopeless and fatalism adjustment styles were significantly negatively correlated with quality of life, suggesting that a diminished emphasis on psychological adjustment styles such as helplessness/hopelessness and fatalism is associated with a better quality of life. Cognitive avoidance, fatalism, and hopelessness/helplessness were all significantly positively correlated with each other, suggesting that the more patients avoid their illness and/or dwell on the negatives, the higher the sense of fatalism about their illness. On the other hand, spiritual well-being was negatively correlated with cognitive avoidance, fatalism, and hopelessness/helplessness, which might indicate that people who are able to find meaning in their illness are more likely to utilize more functional psychological adjustment styles.

The correlational results generally support previous research findings with regard to the associations between spiritual well-being and quality of life (Brady et al., 1999; Cotton et al., 1999; McClain et al., 2003; Rhodes & Kristeller, 2000) and support an association between quality of life and psychological adjustment styles such as fatalism, helplessness/hopelessness, and, in particular a fighting spirit (Cotton et al., 1999; Montgomery et al., 2003).

Overall, the findings provide support for Cotton et al.’s (1999) study, which reported a positive correlation between spiritual well-being and quality of life, a significant positive correlation between spiritual well-being and fighting spirit, and a significant negative correlation between quality of life and the use of a helpless/hopeless adjustment style. However, there were some differences between our study and that of Cotton et al., who reported no significant association between quality of life and fighting spirit. Our study found a significant correlation between the variables, and the ultimate predictive model includes both these components. In addition, our study demonstrated a negative correlation between quality of life and fatalism, whereas these variables were positively correlated in Cotton et al.’s study. Reasons for these differences are explored later in this discussion.
Spiritual well-being and quality of life

It is clear from the multiple regression that spiritual well-being was most strongly associated with quality of life among patients living with leukaemia. Having a reason for living, feeling peace, making life more productive, feeling a sense of meaning and purpose in life, being able to feel comfortable in oneself, feeling a sense of harmony, being able to find comfort in faith or spiritual beliefs, and a determination to control the environment are factors that contribute to a better quality of life among patients with leukaemia. These results support previous research in that spiritual well-being was found to be associated with quality of life in patients with HIV and cancer (Brady et al., 1999; Fitchett, Min, Peterman, & Cella, 1996), lymphoma disease (Vickberg et al., 2001), sickle-cell disease (Cooper-Effa, Blount, Kaslow, Rothenberg, & Eckman, 2001), gynaecology cancer (Gioiella, 1998), and colorectal cancer (Fernsler, Klemm, & Miller, 1999). Interestingly, the results of this study contradict findings of Cotton et al. (1999) and Zebrack (2000a). Both reported that spiritual well-being was not associated with quality of life of participants in their studies. Cotton et al. (1999) found that additional sub-scales of psychological adjustments (i.e., fighting spirit) contribute to quality of life for women with breast cancer. Zebrack (2000a) reported that cognitive or psychological adjustment contributed more to quality of life of people living with leukaemia and lymphoma, and explained the finding as due to the negative impact of treatment and illness, which might challenge rather than augment one’s spirituality.

Strengths and limitations of the current study

A particular strength of this study is the homogeneity of the sample, as all participants were living with leukaemia. Some previous studies have investigated spirituality, quality of life, and psychological adjustment styles, and/or the relationships between them, with participants diagnosed with various cancers and chronic illnesses (e.g., Fitchett et al., 1996; Kawa et al., 2003; McClain et al., 2003; Murray et al., 2004; Narayanasamy, 2004), despite vast difference in treatments, disease trajectories, and patient demographics. Additionally, participants in the current study had not undertaken any standard psychosocial programme unlike Cotton et al. (1999) and Zebrack’s (2000a, 2000b) studies, where participants had participated in psychosocial programmes prior to data collection. Participation in such programmes could potentially influence the respondents’ psychological adjustment styles, and even the meaning they attribute to their disease. This study is the first such investigation to be conducted with West Australians as participants, thus further contributing to the internationalization of data (Andersen, 2002). The bulk of previous research has been in the US (e.g., Fitchett et al., 1996; McClain, 2003; Murray et al., 2004), Taylor, 2003; UK (e.g., Molassiotis & Morris, 1999; Narayanasamy, 2004), Japan (e.g., Akaho et al., 2003; Kawa et al., 2003) and the eastern states of Australia (e.g., McGrath, 1999, 2001, 2004; Xuereb & Dunlop, 2003). Finally,
despite the moderate sample size, a full examination of the sample distributions suggests that the findings can be considered robust.

In terms of limitations, anecdotal reports indicated that there was hesitation from some patients about participating in the study due to the ambiguity concerning the meaning of spiritual well-being. The perceived association between spiritual well-being and religion may have contributed to the limited sample size. This issue has been explored by McGrath (1997, 2004) who argued that language used to communicate spirituality needs to be clarified. The cross-sectional correlational design also limited the scope of the study as any changes over time in the relationships between quality of life, spiritual well-being, and psychological adjustment styles could not be explored. This issue could be addressed utilizing a longitudinal design.

**Practical and theoretical implications**

Despite the study’s limitations, the reported associations between spiritual well-being, sub-scales of psychological adjustment (i.e., fighting spirit, helpless/hopeless, anxious preoccupation, and fatalism), and quality of life demonstrate that spiritual well-being is an important factor in the adjustment to living with leukaemia and might enhance the quality of life of those people living with the disease.

The current study provides the basis for a better understanding of how patients with leukaemia cope with their illnesses to enhance their quality of life. It is hoped that the findings will contribute to the development of sensitive and appropriate psychosocial programmes for patients with haematological malignancies, which is a clearly identified need (McGrath, 1999; Zebrack, 2000a). The findings from this exploratory study also have important implications for those who work with psychosocially distressed patients. These findings add to the body of research suggesting that spirituality is one component of an effective interdisciplinary approach to care (Bolmsjö & Hermerén, 2002; Fisher, Guilfoyle, & O’Connor, 2006; Gabriel et al., 2001; Lesho, 2003; O’Connor, Fisher, & Guilfoyle, 2006).

Reported psychosocial–spiritual interventions, in the context of coping with leukaemia, have included spiritual discourse (McGrath, 1997) and a positive thinking approach. These supports may be used, if deemed appropriate, in order to enhance aspects of fighting spirit, hopeful contemplation, self-reflection, meditation, and prayer (Cerrato, 1998; Post, Puchalski, & Larson, 2000; Watson et al., 1988).

**Conclusions**

This study found a number of significant correlations between spiritual well-being, psychological adjustment styles, and quality of life in patients living with leukaemia in Western Australia. Spiritual well-being was most strongly associated with quality of life for people living with leukaemia and, when combined with fighting spirit, accounted for a significant proportion of the variance in quality of life. Thus, we argue that spiritual well-being should be
addressed alongside physical and social well-being factors. Moreover, health professionals, families, carers, and the research community should give far greater attention to psychosocial–spiritual support, how this changes throughout the illness trajectory, and how it is associated with other key variables that define quality of life for patients with leukaemia.

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