MASTER OF PHILOSOPHY

Religion and health: a systematic review

Quigley, Catherine Francis

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Introduction

The subject of this chapter is the relationship between organisational religious measures, specifically, church attendance, and its effects on physical health. The review executed by Koenig, McCullough, and Larson (2001) offers an excess of empirical research that examines this area. The studies, as before, have been rated on a scale between one and ten. Consequently, the intention of this chapter is to outline the studies presented in the review and to document the problems associated with each group.

The relationship between religious attendance and physical health offers a further area of interest for researchers. Levin and Vanderpool (1987) conducted a review that investigated this subset of religion along with a range of epidemiological difficulties. In the review, Levin and Vanderpool (1987) examined twenty-seven studies that were conducted between 1957-1986 and from these twenty-seven studies, twenty-three of them reported that frequency of religious attendance was significantly associated with a variety of health outcomes, in a positive direction. The remaining four studies reported a nonsignificant association between religious attendance and whatever health outcome that was being investigated.

As pointed out by Levin and Vanderpool (1987), it would appear that frequent attendance at religious services is a protective factor against a wide range of illness outcomes. However, these reviewers suggest that this is not the full account of the

findings; in the review, they present numerous limitations, which include methodological issues and analytical issues.

The empirical research examined will be evaluated under A-Levels-of-Evidence approach, in order to observe whether the relationship between the two variables are as justified as declared by Koenig, McCullough, and Larson (2001) and to communicate if there is enough high-quality evidence available to infer the existence of a relationship.

Hypertension

Levin and Schiller (1987) were the first reviewers to investigate the accumulated research evidence on the scientific effects of religion on mortality and morbidity. The reviewers discovered 250 studies dating back over 150 years, which incorporated at least one measure of religion, variously defined (Levin and Vanderpool, 1989). In relation to hypertension, the conclusion typically rendered by these studies is that religion is therapeutically significant for hypertension. In relation to religious attendance, it was reported that subjects reporting high levels of commitment seem to be at lower risk for hypertension. In a later review, Levin and Vanderpool (1989) review the literature focusing specifically on hypertension. The authors disclose from the five studies, which investigated the two variables that frequent religious attendance was associated with lower blood pressure. For instance, Scotch (1963) found significant effects both for religious attendance among rural subjects and for church membership among urban female subjects. Findings showed that individuals with lower systolic blood and diastolic blood pressure reported that there were monthly churchgoers; the trend fell short of statistical significance (Walsh, 1980).

Another study found a significant, inverse association between religious attendance and biologic effective blood pressure (Walsh and Walsh, 1987). In addition, a study from the Evans Country Georgia, indicated that subjects reporting at least weekly religious attendance had lower systolic blood pressure, even after controlling for body mass (Graham, Kaplan, Cornoni-Huntley, James, Becker, Hames, and Heyden, 1978). However, Levin and Markides (1985) found the opposite among older Mexican Americans. However, the former studies conducted by Walsh (1980), Walsh and Walsh (1987) and Graham and colleagues (1978) presented a piece of empirical research that incorporated multiple controls in the analysis in which positive therapeutic relationships remained.

Since the review of Levin and Vanderpool (1989), subsequent reviews have been conducted, with the most recent review by Koenig, McCullough, and Larson (2001), presenting ten studies. The reviewers considered the research within this domain as being at least average in its overall design. Hence, no study received a rating of five or below.

Average Publications (Rating 5-6)

There were four studies (36%) in the area, which received a rating of six. The results reported from the research revealed that a public religious practice was related to lower hypertension pressures for a variety of population groups. This finding was validated in a study investigating the relationship between frequency of church attendance and men's blood pressure levels (Hutchinson, 1986). This study was performed on 357 residents (18-92 years) belonging to a Caribbean Island, results showed that among males frequency of church attendance was significantly related to both systolic and diastolic pressures. However, among women this significant finding

was not present. Koenig, Moberg, and Kvale (1988) reported similar findings among 106 elderly medical patients. Results reveal that among elderly medical patients hypertension was lower for more frequent church attenders, in an uncontrolled analysis.

One of the studies reported that there was no association between the two variables. For instance, Walsh (1980) reported in a sample of 75 recent immigrants, by splitting the sample into those attending church more than 12 times per year and those attending church less frequently, that there were no significant differences between the two groups on blood pressure levels. Similarly, Levin and Markides (1985) reported that church attendance was not significantly associated with hypertension in a three generation, cross-sectional study of 1,125 Mexican Americans.

These studies received a respectable level of recognition by the reviewers as being slightly above average. Consequently, it would seem plausible to postulate that the relationship between church attendance and hypertension was one that is associated. However, utilising A-Levels-of–Evidence strategy the studies would receive a rating of C (inconclusive) since the do not meet the criteria to be considered for further evaluation. The studies fail to proceed to the next stage of the review because the research was of a cross-sectional design.

Good Publications (Rating 7-8)

Koenig, McCullough, and Larson (2001) rated six of the eleven studies (55%) as having a good overall design and gave them a rating of seven or eight. Results from the findings reveal a relationship that is generally positive, with the majority of the

empirical research showing greater frequency of religious attendance having salutary effects for hypertension. For instance, Graham, Kaplan, Coroni-Huntley, James, Becker, Hames, and Heyden (1978) conducted a study on 355 white, male head of households who participated in the 1967-1969 Evans Country Cardiovascular study in Georgia. The subjects had to be free of diagnosable coronary artery disease, not taking medication for heart or circulation, not told by a medical doctor that they had hypertension between initial 1960-1962 prevalence study and the 1967-1969 follow-up study, and whom church attendance and blood pressure data was collected in 1967-1969. Results showed that subjects who attended church at least once a week had generally lower systolic and diastolic blood pressure scores compared to subjects who did not attend church as frequently ($t= 2.63$, $p< .01$, $t= 1.96$, $p< .05$, respectively). Results remained significant for systolic blood pressure when smoking status was entered into the analysis. In addition, results remained partially significant when body mass and socio-economic status were entered in to the analysis.

Lapane, Lasater, Allan, and Carleton (1997) reported on an association between religion and cardiovascular disease in a survey of two population based random samples. The researchers found that non-church members had lower systolic blood pressure; however, after adjustment for other risk factors (i.e., age, sex, ethnicity, smoking and alcohol consumption), the diastolic blood pressure of church members was significantly less than non-church members ($p< .05$).

Larson, Koenig, Kaplan, Greenberg, Logue, and Tyroler (1989) examined the impact of religion on men's blood pressure on 401 respondents free of hypertension and any cardiovascular disease. The respondents were identified through the Evans County

Cardiovascular Epidemiologic study at the 1967-1969 follow-up. Correlations between religious attendance and diastolic and systolic blood pressures revealed that high church attendance was not statistically significant for systolic blood pressure, but high church attendance was statistically significant for the diastolic blood pressure ($p < .01$). Controlling for smoking, socio-economic status, and body mass the association remained statistically significant for men aged 55 or over ($p < .05$). Scotch (1963) reported that church membership was associated with absence of diastolic hypertension among women in urban areas ($p < .01$), but not for men in urban areas. In addition, Scotch (1963) found that diastolic hypertension was more common among infrequent Christian church attenders ($p < .001$) and among men and women Zulus living in rural areas. The results were from an uncontrolled analysis. Finally, Walsh (1998) found that hypertension was lower for 137 immigrants who reported higher frequent church attendance.

However, Brown and Gary (1994) did not report an association. Their study revealed that there was no association between church attendance and hypertension in 537 black men from a community sample. They reported that religious attendance was related to smoking status and daily drinking, both at the $p < .05$ level.

It could be suggested that the conclusion, religious attendance is beneficial for reduced levels of hypertension. This conclusion can be substantiated with the evidence from the previous empirical research. However, when the articles were rated under the systematic review, they all receive a rating of C (inconclusive) with the flaw that the researchers conducted cross-sectional designs.

In viewing the publications cited by Koenig, McCullough, and Larson (2001), it appears that the general conclusion that religious attendance lowers hypertension can be validated by the empirical research. However, as it has been viewed, the majority of these conclusions come from studies that did not incorporate the use of controls within their analysis; hence, not ruling out the potential effects of these exogenous variables on the strength of the relationship. Examining the hypothesis, under A-levels-of-Evidence strategy that public religious activity protects against hypertension, cannot be executed, as none of the empirical research meets the minimal methodological standards to be evaluated. Consequently, the accumulated research reaches the level of *insufficient evidence* for the hypothesis. This finding denotes that a greater amount of empirical research needs to be generated.

Heart Disease

Over two dozen studies have examined religious differences in relation to heart disease, with conclusions usually being presented that suggests public religious activities have therapeutic effects for heart disease (Levin and Schiller, 1987). This literature includes several measures of religion (affiliation, attendance, Jewish ethnicity, parental affiliation and attendance, importance of religion, religious homogeneity of marriage, and self-rated religiosity). However, the research cited by Koenig, McCullough, and Larson (2001) investigating the link between religious attendance and heart disease is minimal. Within the review, Koenig, McCullough, and Larson (2001) present two studies that assessed the relationship. The first study received a rating of seven, which is considered good-quality by the reviewers.

Good Publications (Rating 7-8)

The first study conducted by Comstock (1971) examined fatal arteriosclerotic heart disease, water hardness, and socio-economic characteristics in a sample of 378 white males aged 45-64. The cases were matched by age, race, and sex. From the sample, 189 of the cases in the study died due to arteriosclerotic and degenerative heart disease during a 3-year period. It was established that the risk of dying from artiosclerotic heart disease was over twice as great for men attending church less than once per week, compared with frequent attenders (RR 2.02, $p < .01$). The risk ratio was slightly reduced but remained robust when smoking, socio-economic status, hard water, and other risk factors were taken into account. Although, results revealed a positive relationship, the study was a case-control, cross-sectional study; hence, viewed as containing flaws and does not meet the requirements for evaluation. Therefore, the study is rated in the category C (inconclusive).

Excellent Publications (Rating 9-10)

There was one study within this subsection that was cited by Koenig, McCullough, and Larson (2001) as being of excellent quality. The study conducted by Oxman, Freeman, and Manheimer (1995) investigated lack of social participation or religious strength and comfort as risk factors for death after cardiac surgery in the elderly. The study consisted of 232 subjects aged 55 or over who received elective heart surgery. The investigators obtained data on a variety of endogenous (religiousness and blood pressure) and exogenous variables (age, sex, health status, psychological and psychiatric factors, personality, social factors, and social support). The main variables of interest, i.e., religiousness and heart disease, were measured through self-report and by physiology measures, respectively. However, the researchers did not perform any statistical analysis on the main variables of interest, religion and heart disease.

Consequently, there is no support for the hypothesis, which states that public religious activities protects against heart disease. In relation to A-Levels-of-Evidence approach, the study presented in this subsection can not be considered for further consideration as there were no statistical analysis performed on the constructs. Therefore, the study is rated in the category C.

Koenig, McCullough, and Larson (2001) suggest that public religious behaviours, such as church attendance were positively associated with physical health characteristics, such as heart disease. It can be viewed by the publications investigating this domain that this proposition can be partially supported. For instance, the first publication examined revealed that there were positive associations, which remained robust when covariates were controlled for in the analysis (Comstock and Tonascia, 1977). The second did not perform any statistical analysis on the variables to infer support for the hypothesis. In relation to the systematic review process, the studies do not meet the minimal methodological standards to be evaluated as the first publication contained the flaw of conducting a cross-sectional study and the latter study contained the flaw of not performing any statistical analyses on the variables. Subsequently, the studies are rated in the category C, denoting that the methodology from the publications are inconclusive. In relation to evaluating the evidence for the strength of the hypothesis the current evidence meets the level of *insufficient evidence.*

All-Cause Mortality

Over the past two decades, increased interest has been shown in measuring public religious behaviours, such as frequency of attending services, rather than religious

affiliation, in relation to its relationship with mortality. Early reviews assessing this association, for example, Levin and Schiller (1987) have reported that 'Church membership has been very strongly associated with lower mortality, in both sexes and at all ages' (p.18). The reviewers examined a small number of studies available at the time and discussed how the relationship between religious attendance and mortality is more robust for certain types of mortality, i.e., cirrhosis of the liver and emphysema. Levin and Schiller (1987) also discussed how frequent attendance is associated with decreased overall mortality, a finding which persisted after controlling for age and various risk factors.

In a meta-analytic review, McCullough, Hoyt, Larson, Koenig, and Thoresen (2000) remarked that religious involvement has a nontrivial, favourable association with all-cause mortality. The reviewers identified 42 independent effect sizes based on samples of nearly 126,000 people, which represented the association of religious involvement and all-cause mortality. Results revealed that religious involvement was significantly associated with lower mortality (OR= 1.29; 95% confidence interval: 1.20-1.39), indicating that people high in religious involvement were more likely to be alive at follow-up in comparison with people who were lower in religious involvement. From these 42 publications, 28 of them utilised at least one measure of public religiousness.

In relations to the most recent and extensive review conducted on the religion and health association, Koenig, McCullough, and Larson (2001) remarked that

> 'Frequent religious attendance (once a week or more) is associated with a 25%-33% reduction in the risk of dying during follow-up periods ranging from five to twenty-eight years. This association appears stronger in women and is

independent of confounders (age, sex, race, education, and health status)' (p. 330).

It appears that evidence from the empirical research, reviews and meta-analytic reviews report that there is an association between the two variables. In addition, conclusions generally report that public religious behaviours provide mainly a sole predicator of reduced mortality.

Good Publications (Rating 7-8)

Koenig, McCullough, and Larson (2001) cited twenty, mostly, high-quality publications, which examined this domain. The lowest category that these studies were placed in was the good publications category, rating seven to eight; in which four publications were cited. The typical conclusion rendered by the publications within this domain, is that public religious activities, particularly frequent religious attendance provides salutary outcomes on all-cause mortality. For instance, Comstock and Lundin (1967) examined the relationship between smoking and perinatal mortality, in which maternal church attendance was utilised as a serendipitous guest variable as one of the many background variables. The findings from the analysis revealed that frequent church attendance (defined as attending services at least once a month), for a smoking mother, was not related to neonatal death rates. However, if the father had a ninth grade education or better, it was observed that there were 28 deaths/1,000 live births for frequent attenders vs. 31 deaths/1,000 live births for infrequent attenders. The risk of neonatal death was concentrated among children of poorly educated fathers and smoking mothers, with increased risk if the mother attended church infrequently; 11 deaths/1,000 live births for frequent church attenders compared to 24 deaths/1,000 live births for infrequent church attenders.

A later study, performed by Comstock and Partridge (1972) examined the relationship between church attendance and health. However, the religious variable on this occasion was examined as a chief predictor. The researchers compared death rates for a three to six year period for 24,245 frequent church attenders and 30,603 infrequent church attenders. Results showed that there were differences in the relative risk of dying from artiosclerotic heart disease between frequent and infrequent attenders (RR= 2.1 for infrequent attenders), for white females, aged 45-64. In relation to both sexes, it was reported that the relative risk of dying from pulmonary emphysema was 2.3 for infrequent attenders; cirrhosis of the liver had an increased risk of 3.9 for infrequent attenders; and suicide was at a 2.1 increased risk for infrequent attenders. There were no differences in relative risk between the two groups for cancer of the rectum or colon. Adjustments for differences in the race, sex, and age composition of the populations did not make major differences to the relative risk ratios.

The results from the two studies, could lead to postulations that frequent church attendance is related to beneficial outcomes, reducing the likelihood of dying from a number of chronic disorders. However, the studies presented were of a cross-sectional design; hence, the broad range of associations can be taken to indicate that the relationship of church attendance to health is non-specific rather than causal. It is possible that the observed associations came about because health can affect church attendance. Ill individuals may not be able to attend religious services due to their health, suppositioning that frequent religious attendance is a proxy measure for functional health. Additionally, the disorders that featured the marked differences between groups were illnesses that are generally related to lifestyle behaviours, i.e.,

pulmonary emphysema is associated with smoking and cirrhosis of the liver is typical associated with alcohol consumption. However, these lifestyle behaviours are not controlled for in the analyses, so, relinquishing the ability to deduce if church attendance is the sole predictor of these chronic conditions. In terms of the systematic review, A-Levels-of Evidence approach, the evidence from these publications would be eliminated from the review process and receive a rating of C (inconclusive).

Within this subsection, few of the studies incorporated longitudinal designs, strengthening the ability to infer causation about the relationship. For instance, Comstock and Tonascia (1977) performed an 8-year prospective cohort investigation involving 47,423 persons aged 25 and over. The respondents provided information on a variety of variables including, race, sex, age, martial status, current cigarette smoking, education, number of bathrooms in dwelling unit, frequency of church attendance, and mortality rates. Results revealed that over the 8-year period there was a strong association between frequency of church attendance in 1963 and subsequent mortality. Persons who went to church at least once a week had the lowest mortality (crude death rate= 1308.1/100,000 persons) and those who never attended church had the highest mortality (crude death rate= 2591.3/100,000 persons). Removing the effects of the additional predictor variables increased the specificity of the association between mortality and church attendance for individuals who reported that they attended church at least once a week, whilst decreasing the association for individuals who report nevergoing to church. This finding indicates the importance of socio-demographics in explaining the observed associations. In addition, it was reported that for the last two years the standardized mortality ratios for church attendance was examined and the linear and inverse association with mortality, which had been strong

during the early years of the study, became progressively weaker with the passage of time and disappeared completely during the seventh and eight years of observation.

Idler and Kasl (1992) examined the relationship between some measures of public religiosity and mortality in 2,812 older adults over a 4-year period. The initial data collection obtained information on self-rated health, self-reported chronic conditions, pain symptoms, functional disability, physical measurements of blood pressure, depression, health habits, use of health services, social networks and support, and socio-demographics. In addition, a 2-item measure of public religiousness was utilised based on the responses to the questions, 'About how often do you go to religious meetings or services?' and 'How many people in your congregation do you know personally?' Results from the regression analyses revealed that public religiousness was not a significant predictor of 4-year mortality for males or females.

These two publications cited by the Koenig, McCullough, and Larson (2001), represent studies that are of high epidemiological quality, in that they offer all conditions that are required for inclusion into A-Levels-of-Evidence systematic review. In relation to the review rating process, for the mediated model, the first publication cited would receive a rating of A (ns), which means that the evidence provided by the study was generally sound, yet did not provide support for the hypothesis. As for evaluating the study under the independent model, Comstock and Tonascia (1977) did not adequately control for established protective factors. In relation to the latter publication (Idler and Kasl, 1992), the study would be rated as A (conclusive), therefore, indicating that it did not include any of the flaws that would

cloud interpretation. However, the evidence reveals that there was not a significant association between the two variables.

Excellent Publications (Rating 9-10)

The final category specified by the reviewers was nine to ten, indicating that the publications cited within this subsection were of excellent quality. Koenig, McCullough, and Larson (2001) cited a large number of publications that examined the relationship between public religious behaviours and mortality, all of which incorporated high quality methodological. The typical findings from these 16 empirical studies were that there was a positive relationship between public measures of religiosity and reduced levels of mortality. For instance, Zuckerman, Kasl, and Ostfeld (1984) assessed the psychosocial predictors of mortality among a sample of 398 elderly poor residents (aged 62 or over). The study examined the role of religion, by assessing the religiousness factor by a 3-item index, which included an item assessing frequency of church attendance. The study was performed over a 2-year period, in which the predictor variables were assessed at baseline only, and mortality at the 2-year follow-up. The results from the analysis showed that the religion index and health index have a highly significant interaction effect with mortality ($p < .001$). The items that made up the religious index were examined separately and it was reported that church attendance was weakly associated with mortality (no statistics provided).

Empirical studies tend to indicate that a relationship exists, between religiosity and health, specifically for persons of black origin. Consequently, Bryant and Rakowski (1992) found a positive relationship in African-Americans when assessing the

independent predictive power of public religious activities. The researchers examined a cohort of 473 African-Americans aged 70 or more, over a 4-year period. The respondents were asked a variety of questions concerning socio-demographic characteristics, health problems, and functional health. The religious variable was assessed as part of a social involvement index, which asked respondents to indicate if they were attending religious services over the past two weeks, going to a club, organisation, class, or other group related event. Results showed that seniors who did not attend church services or church-based meetings had a higher mortality than seniors who attended church (OR= 1.77, $p< .05$). Whenever, an analysis was made that examined the gender interactions with the friends contact index, it was revealed that church attendance continued to remain significantly associated with the health variable (OR= 1.77, $p< .05$). The analysis proceeded to assess the gender by church attendance cross-tabulation and it was revealed that African-American men who did not attend church had a mortality ration of 2.7 times higher than African-American women who attended church ($p< .05$).

A later study, examined the associations of different biopsychosocial predictors of mortality, Glass, Mendes de Leon, Marottoli, and Berkman (1999) hinted to an association between public religious activities and mortality. The researchers examined if there were any associations between social, productive, and physical activity and 13-year survival in older people. The study comprised of 2,812 men and women aged 65 and over, living in the community. The sample was designed to be similar to the local population with respect to age, sex, martial status, living arrangements, and race/ethnicity. Data collection began in 1982 and repeated annually for 13-years. Data collected included information on socio-demographics (age,

marital status, education, race, and family income) and health status (self-reported medical condition, functional disability, and relative weight). Respondents were asked at baseline, the frequency of 14 common activities, which included church attendance, which were subsequently split into three dimensions (social, fitness, and productive). The outcome measure, death, was assessed by using several methods including daily review of newspapers and hospital admissions records, and by using the national death index. Results showed that for the entire cohort, 62% died during follow-up. There was a clear mortality gradient across levels of activity for each type of activity. Those in the least active social quarter (which included church attendance) were 20.3% more likely to die than those who were in the most active social quarter.

Further analysis showed that with reference to the social activity dimension result, which was adjusted for age, sex, race, marital status, body mass index, current smoking status, income, functional status, and history of smoking, cancer, stroke, diabetes, and myocardial infarction, the variable remained significantly related to survival status (R^2= -.069, p< .001). However, the religious variable investigated within this study was clustered together with a range of other social activities, such as visits to the cinema and participation in social groups, hence prohibiting any inference on the sole beneficial effects of church attendance on survival.

These three studies cited do not meet the standards to be further considered by A-Levels-of-Evidence approach. The first study (Zuckerman, Kasl, and Ostfeld, 1984) did not perform any statistical analysis on the main variables of interest. Therefore, it is not possible to provide support for the hypothesis. Bryant and Rawowski (1992) controlled for sex only, in the analysis; however, due to the complex nature of the

relationship, more socio-demographic controls are required. The third study performed by Glass, Mendes de Leon, Marottoli, and Berkman (1999) did not perform specific statistical analysis on the predictor variable, church attendance. The variable was clumped together alongside a variety of additional social activities. Subsequently, it would not be possible to infer any conclusion on the effects of church attendance and mortality. Considering these methodological flaws the rating that the publications receive is C, denoting that the evidence is inconclusive.

However, a plethora of research was performed within this area, which can be utilised for the evaluation process. For instance, Rogers (1996) examined the effects of family composition, health, and social support linkages on mortality in a 7-year prospective cohort study involving 15,938 elderly community dwelling residents. Descriptive statistics revealed that of persons alive in 1991, 53.7% attended church or temple in 1984; of person's dead in 1991, 41.1% attended church or temple in 1984. Employing discrete-time event history methods, to examine the effects of predictor variables on mortality, in a multivariate model, results revealed that attendance at church or the temple reduces mortality (β= -.28, $p< .001$). This finding remained consistent with controls for demographic characteristics, health constraints, and social support from other sources (i.e., family, friends, and engaging in other activities), β= .24 ($p< .001$).

However, studies have been performed that examined religious service attendance as an independent predictor of mortality. For instance, Goldman, Korenman, and Weinstein (1995) performed a 6-year study on a sample of 7,478 persons aged 70 and over. Data was collected on a variety of variables including, socio-demographics, health status, and social environments that included a measure on church attendance.

The results showed that lack of attendance was significantly related to probability of dying during the 6-year study period for males ($\beta = .36$, $p < .05$) and for females ($\beta = .35$, $p < .05$), after controlling for multiple exogenous variables (age, race, marital status, functional health status, self-assessment of health, and medical conditions).

Similarly, in a high quality study, Oman and Reed (1998) examined the relationship between religion and mortality in a two wave, 5-year prospective cohort study of 1,931 older residents aged 55 or older. The main variable of interest, religious attendance, was measured by a single question, 'How often do you usually attend religious services', with five possible responses, ranging from '3 times a week' to 'never'. The outcome measure, mortality was determined by screening local newspapers for obituary notices or by attempted contact for re-interview at the time of the second examination. In addition, the researchers, at baseline interviews, measured a number of covariables, which were believed to play a causal influence on the religion and mortality relationship. The covariables believed to be of influence were grouped into six categories. The first category was demographics, which included information on sex, age, marital status, income, years of education, employment status, job type, years of residence in county and ethnic group. The second category called health status was measured by the amount of chronic diseases diagnosed by a physician. Next, physical functioning was measured by a number of physiological and self-reported measures. Health habits was measured by the respondents indicating their exercise habits, eating habits, sleeping habits, taking medications, alcohol consumption, smoking, body mass index, possession of health insurance, and availability of medical care. The fifth latent variable of interest was social functioning and support, which were measured by asking respondents to indicate how often they

attended a number of social activities and if they received social support from a number of outside persons. The sixth and final variable, depression, was measured by the psychometrically sound Center for Epidemiologic Studies Depression Scale (Radloff, 1997). These covariates are believed to be important variables that potential explain the observed relationship between religion and physical health, such as all-cause mortality.

Results from the analysis revealed that nearly one quarter of the sample indicated that they attended religious services weekly or more often. In relation to mortality, it was found that during the follow-up period, 206 men died and 248 of the women died. Age adjusted mortality rates for respondents showed that for both sexes, weekly attenders had the lowest mortality and non-attenders had the highest mortality (tests for the trend were significant at $p < .01$). Examining the differentials between high and low attenders, it was shown that weekly attenders were more frequently married (applies to men only), had less lower-body disability, had better balance (men only), exercised more, smoked less, drank less alcohol, were more overweight, did much more volunteer work, left the house more days, and were less depressed (men only). In relation to their influence between the religion and mortality association, it was revealed that after adjusting for all classes of variables, occasional and weekly attendance gave protective relative hazards of 0.80 (ns) and 0.72 ($p < .01$) respectively, revealing that there were significant trends toward greater protection from more frequent attendance. However, when religious attendance was dichotomised into attenders vs. non-attenders, the protective relative hazard for model 1 (age and sex adjusted) was 0.64 (95% Cl0.52-0.78) the final model reduced this into 0.76 (95% Cl 0.62-0.94), primarily from the effects of social support and physical functioning.

In one of the later studies, which assessed the relationship between religious attendance and survival, Koenig, Hays, Larson, George, Cohen, McCullough, Meador, and Blazer (1999) reported positive associations, specifically in females. The study assessed 3,968 older adults over 6-years on a number of variables. For example, demographic variables, physical functioning, self-rated health, chronic conditions, depression, negative life events, marital status, social support, smoking, alcohol consumption, and body mass index. Baseline associations revealed that frequent attenders were more likely to be women, better educated, and black. They were less likely than infrequent attenders to have impaired physical functioning, chronic health conditions, fair or poor self-rated health, or depression. They were also more likely to be married, have larger social networks, and people they could depend on in times of trouble. Finally, frequent attenders were less likely to smoke cigarettes and consume less alcohol. Therefore, it would seem that because of this healthier lifestyle of frequent church attenders, this group were less likely to die than infrequent attenders during the follow-up period (22.9% vs. 33.4%, χ^2= 99.4, df=1, p< .001). Results using Cox's proportional hazards analyses revealed that for the total sample frequent religious attenders in 1986 had a lower relative hazard of dying compared with infrequent attenders (RH 0.54). When age, gender, education, and ethnicity were added to the model, the relationship was reduced slightly (RH 0.59). Adding health conditions, social connections, and health practices to the model produced further reductions in the magnitude of the relationship, but did not eliminate it (RH 0.72, 95% Cl 0.64-0.81, p< .001). Separating the analysis by gender, it was revealed that women who attended religious services more frequently were only about one half as likely to die as women attending services less frequently (RH 0.51); this effect was weaker for

men (RH 0.63). When the covariates were added to the models, this reduced the relationship between religious attendance and survival for both genders, but more so for men (RH 0.83, 95% CI 0.69-1.00, $p < .05$) than for women (RH o.65, 95% CI 0.55-0.76, $p < .001$).

In examining an adult sample rather than an elderly cohort, House, Robbins, and Matzner (1982) provided support for the beneficial association between the two variables. In a 9-12-year prospective cohort investigation, the researchers examined 1,322 men and 1,432 women who in 1967-1969 were ages 35-69. All-cause mortality over the ensuring 9-12 years was the outcome variable. It was found that among women, frequency of church attendance was inversely related to risk of death ($\beta = .13$, $p < .05$), whereas 17.3% of women who never attended church died, in comparsion with 5.4% of weekly attenders. For men, it was reported that there were no significant associations between church attendance and mortality. The analysis controlled for age and health status in women.

Schoenbach, Kaplan, and Kleinbaum (1986) performed a prospective cohort study of a population-based sample of 2,059 persons (over the age of 50) involved in the Evans County Cardiovascular Study in Georgia. The sample was initially examined in 1960, and subsequently re-examined in 1967. The mortality data was examined in 1980, which covered 20 years; it was revealed that 26% of the sample had died by 1980. it was shown that participation in church activities was associated with lower mortality for persons aged 60 or above, except in black males. The effects were particularly notable for white males (43% vs. 60%), white females (355 vs. 52%), and black females (41% vs. 50%). After controlling for covariates the low religious

activities increased the age-adjusted hazard ratio by 50% in white males and 60% in black females, but not significantly for white females and black males.

In an empirical study examining the specific effects of religious involvement on adult mortality, Strawbridge, Cohen, Shema, and Kaplan (1997) found that there was a significant association between the two variables. The researchers performed a 28-year longitudinal study on 5,286 persons aged 21-65 (at baseline). From this original sample, 2,540 were still alive for the 1994 follow-up survey. At baseline (1965), analysis of the data revealed that 255 of the sample attended church once a week or more. The characteristics of this group was that frequent attenders were more likely to be women (OR 1.62), black (OR 1.64), have impaired mobility (OR 1.66), have close social contacts (OR 1.42), have 3 or more group memberships (OR 1.21), be less likely to smoke cigarettes (OR 0.40), and be obese (OR 1.44). Relative hazards of dying for frequent religious attenders was 0.64 (95% CI 0.53-0.77); adjusting for social connections and health practices reduced the association (RH 0.77) and for women in particular (RH 0.66) but not men (RH 0.90). The results, from the 1995 follow-up, revealed that frequent religious attenders were more likely to stop smoking, increase exercising, increase social contacts, increase membership in non-church community groups, and stay married more than non-attenders.

Hummer, Rodgers, Nam, and Ellison (1999) found that there was a significant relationship between public religious activities and mortality. The researchers assessed 21,204 cases in their analyses, of which 2,016 were identified as dying over the 8-year period. The data set also included information on age, sex, race, health status (activity limitations, self-reported health status, and bed sick days), socio-

economic status (education and family income), health behaviour (smoking, alcohol consumption, and body mass index), and social ties (marital status, friends, and relatives). Descriptive statistics revealed that the majority of the sample that survived at follow-up was female, non-black, reported that their health was very good, had fewer sick bed days, no limitations on their physical activity levels, were currently married, had good social ties, never smoked, drank moderately, and have a moderate body mass index. In addition, it was reported that 7% of individuals who were reported as dead attended religious services more than once a week compared to 41% of dead individuals who never attended religious services. Further analysis, using a Cox proportional hazards model revealed that there was significant differences in mortality ratio's between individuals who attended church more than once a week (reference group) and individuals who reported that they never went to church ($p < .01$). This result remained significant, albeit, weakened with the inclusion of the other covariates in the equation.

In a secondary analysis of the data, religious attendance was assessed in relation to cause-specific adult mortality with controls. The results revealed that there were significant differences between the reference group (attend religious services more than once a week) and those who never attended church for death from circulatory diseases, respiratory diseases, infectious disease, and residual causes; this finding remained consistent with controls for demographic, health, socio-economic, social ties, and behavioural variables. For few of the cause-specific deaths, religious attendance did not remain significant once the inclusion of controls were incorporated into the analysis. For instance, significance levels for deaths from external causes were diminished once demographics were entered into the analysis. Thus,

involvement in religious community activity has a sizable and consistent relationship with greater longevity.

However, few high quality empirical investigations reported that there were no significant associations between the public religious activities and all-cause mortality. For instance, Idler and Kasl (1991) performed an 8-year prospective cohort study on 2,812 persons aged 65 and over, living independently in the community. A great amount of information on a number of variables was collected. Information included in the dataset were several groups of confounding and intervening variables, such as socio-demographic characteristics and health practices and social support variables. One of the outcome measures utilised was mortality, and it was revealed from the initial sample that 37% (1,037) of the respondents had died by the last follow-up. Results were stratified for gender, and in terms of the analyses for the men, it was revealed that there was no association between public religiousness and mortality when health status in 1982 was controlled. Additionally, with only health status controlled, there was a reduced risk of mortality for women, but this association disappeared when socio-demographics (age in particular) were controlled.

A similar finding was revealed in a study examining a cohort of 232 elderly medical patients, of which 21 died within 6-months of surgery. The prospective cohort study performed by Oxman, Freeman, and Manheimer (1995), examined a number of variables classified into different categories, for example, biomedical, psychological, social, and religion. A single item asking respondents to indicate how often they attended religious functions measured the public religious activity item. Results revealed that there were no significant differences between low and high religious

attenders, of the 21 persons who died 16 revealed that they never or rarely went to religious functions and 5 revealed that they attended religious functions at least every few months (ns).

The evidence from the majority of publications within this subsection would appear to indicate the existence of a relationship between public religious activities and all-cause mortality. If the publications are examined separately, it can be argued that the relationship remains as robust as it first appears. In terms of the systematic review process, the majority of the publications presented within this subsection could be rated and evaluated by A-Levels-of Evidence approach. The publications do not contain the methodological flaws, which prevents inclusion to the review. The first study within this subsection was performed by Rogers (1996). Rogers (1996) examined the effects of family composition, health, and social support on mortality in a seven-year prospective cohort study. Results demonstrated that frequency of attendance at religious services reduced mortality, in a controlled analysis. Assessing the publication under the mediated model, the study would receive a rating of A (positive), indicating that the evidence provided by the study was conclusive, providing support for the hypothesis that public religious behaviours protect against mortality. In relation to the independent model, the publication would receive a rating of A (positive), denoting that the data supports the hypothesis from a study, and does not contain any of the major flaws that would cloud interpretation.

The second publication to be evaluated was performed by Goldman, Korenman, and Weinstein (1995). These researchers reported that church attendance was significantly related to dying after controlling for age race, marital status, functional health status,

self-assessment of health, and medical conditions. In examining the evidence by A-Levels-of-Evidence approach, under the mediated model, the publication would be rated as A (positive), which reveals that the publication provides support for the hypothesis. In relation to the independent model, the researchers controlled for known protective factors; therefore, the study is rated as A (positive), denoting that the methodology is conclusive and supports the hypothesis positively.

The third study was performed by Oman and Reed (1998), whereas it was revealed that church attendance was related to decreased mortality, even after controlling for important covariates. In evaluating the evidence under the systematic review process it was revealed that for the mediated and independent models, the publication was rated as A (positive). This finding indicates that public religious behaviours are related to lower mortality rates that cannot be explained by known covariates.

Koenig, Hays, Larson, George, Cohen, McCullough, Meador, and Blazer (1999) reported that there was significant associations between frequent church attendance and living longer. Adding socio-demographics to the model reduced the relationship slightly; adding risk factors further reduced the relationship but did not eliminate it. In evaluating the publication under the mediated model, the study would receive the rating of A (positive). This rating is also given for the independent model. This indicates that the study does not contain flaws that may cloud interpretation of the evidence and that the evidence supports the hypothesis.

The fifth publication within this subsection provided support for the hypothesis, which states that public religious behaviours protect against mortality. The study

performed by House, Robbins, and Metzner (1982) did not get evaluated under the mediated model as it does not adequately measure potential confounding variables, such as race, gender, or socio-economic status. Therefore, under the independent model the study receives a rating of B (positive). This rating indicates that the evidence provided by the study is generally sound. The publication supports the hypothesis.

Schoenbach, Kaplan, and Kleinbaum (1986) performed the sixth study within this subsection, which could be evaluated by the review. The findings from the research revealed that church activities were associated with lower mortality. Evaluating the data under the mediated model reveals that the publication receives a rating of A (positive), denoting that the evidence is conclusive and supports the hypothesis. However, due to the researchers not controlling for known risk or protective factors, such as social support, health practices, and depression, in the analysis, the publication cannot be rated under the independent model.

The seventh publication within this subsection was performed by Strawbridge, Cohen, Shema, and Kaplan (1997), who reported that frequent religious attenders had lower rates of mortality than infrequent attenders. Controlling for social connections and health practices reduced the association but did not eliminate it. In relation to the mediated model the, the study receives a rating of A (positive) and in terms of the independent model the study receives a rating of A (positive). This demonstrates that the methodology of the study meets the minimal standards to provided conclusive evidence that public religious behaviours protects against mortality.

The eighth publication was the last study, within this subsection, to provide conclusive support for the hypothesis. The study performed by Hummers, Rodgers, Nam, and Ellison (1999) reported that there were significant differences in mortality ratios between individuals who reported that they went to church compared to those who reported that they never went to church. This result weakened with the inclusion of covariates; however, remained significant. Due to the amount of covariates assessed within the study, the data can be assessed under the mediated and independent models. In relation to both models, the evidence is rated as A (positive). This rating demonstrates that the data comes from a publication, which is considered as containing no flaws and the evidence supports the hypothesis.

The final two publications within this subsection did not provide any support for the hypothesis that states public religious behaviours protect against mortality. The studies performed by Idler and Kasl (1992) and Oxman, Freeman, and Manheimer (1995) performed longitudinal studies that utilised information from a variety of important exogenous variables. Subsequently, the two studies get evaluated under the mediated model and independent model. For both of these models, the evidence is rated as A (ns), indicating that the methodology was conclusive; however, the evidence did not support the hypothesis.

From examining the ratings provided by the evaluation, on all the subsections, it appears that there are enough high-quality publications to infer a potential conclusion based on the data from the studies. 12 publications from this section are considered to be of sufficient quality to infer a potential conclusion surrounding the hypothesis. Four of the studies from this section report that there is no support for the hypothesis

(Comstock and Tonascia, 1977; Idler and Kasl, 1991; Idler and Kasl, 1992; Oxman, Freeman, and Manheimer, 1995). The remaining eight studies provided positive support for the hypothesis. Therefore, the hypothesis that church attendance protects against mortality reaches the level of *persuasive evidence.*

Conclusion

The conclusions suggested by the majority of researchers investigating the relationship between public religious behaviours and physical health, is that measures, which assess this area of religiosity, such as frequent attendance at religious services, generally report that the relationship is a positive one. In an early review, Levin and Schiller (1987) commented that there review demonstrated that there was insufficient evidence to conclude that public religious behaviours is positively and significantly related to health. The reviewers comment of a number of areas that caused problems towards generating a conclusion. Levin and Schiller (1987) comment on a variety of areas, which they consider need attention, i.e., epistemological issues, methodological issues, and analytical issues.

In relation to the epistemology of religion, Levin and Schiller (1987) contend that there is the presence of diverse and clashing views regarding what is and is not real or knowledgeable among behavioural epidemiologists, social scientists of religion, and religion scholars. Differing academic traditions conceptualise the construct religiousness quite different. For instance, behavioural epidemiologists prefer to measure the observable and discrete domain from which independent variables are drawn, whereas, social scientists and religion scholars may see this measurement of the religious variable as trivialising what it actually means to be religious. In

critiquing methodological issues, Levin and Schiller (1987) comment that in the majority of research assessing this area, the religious variable is included merely as a background variable. In the final issue, analytical limitations, the reviewers critique the fact that the majority of the analyses from empirical investigations come from studies that do not control for potential confounders, the analyses are typically zero-order.

The review by Koenig, McCullough, and Larson (2001) presents an image, which would suggest that the relationship between public measures of religious behaviours and physical health is largely a favourably one. However, in closer examination of the publications that they cited in their review it can be observed that this is not always the issue, some physical health variables are not influenced by public religious behaviours, whilst it appears that others are. In order to address the existence of the relationship between public religious behaviours and physical health, a objective and systematic approach was taken. Utilising A-Levels-of-Evidence strategy it was possible to deduce which studies met the methodological standards to provide evidence for the existence of the relationship.

Examining the general hypothesis, which states public religious behaviours protect against hypertension, it was observed that there is not enough high-quality empirical studies that have been performed to infer a conclusion. When the publications were scrutinised under A-Levels-of-Evidence strategy, it was clearly observed that none of the publications met the minimal methodological standards for the data to be evaluated for the strength of the hypothesis. The publications cited by Koenig, McCullough, and Larson (2001) assessing this domain provided data that reached the

level of *insufficient evidence.* This suggests that more high-quality epidemiological research is required.

Similarly, in examining the hypothesis that public religious behaviour protects against heart disease, it was observed that there were few studies that researched this supposition. When the studies were investigated utilising the systematic review approach, it was observed that none of the publications cited by Koenig, McCullough, and Larson (2001), met the standards to be considered for evaluation. The publications reached the level of *insufficient evidence*, indicating that more research is required that addressed these methodological inadequacies.

The final physical health topic that was examined in relation to public religious behaviours was mortality. From this section it was observed that there was a plethora of studies which examined this area. Consequently, there was enough evidence available to validate the conclusion. Fifteen studies from this section assessed this domain, with the majority of the research meeting the minimal methodological standards to be evaluated. Eight of the fifteen studies provided positive support for the hypothesis; therefore, the hypothesis reaches the level of *persuasive evidence.*

Examining three of the physical health topics within this chapter, it was observed that the majority of the existing publications have not performed research, which is considered to be of high-quality, according to the guidelines of A-Levels-of-Evidence approach. However, it was viewed that the domain examining the relationship between public religious behaviours and mortality did provide enough evidence to support the conclusion. In considering the overly optimistic view that Koenig,

McCullough, and Larson (2001) write surrounding the relationship, re-evaluating the research using an objective process demonstrates that more research is required.

5 Private Religiousness and Mental Health

Introduction

The theme of the present chapter is to investigate the effects that non-organisational facets of religious behaviour have on mental health. The chapter will discuss the empirical research cited in the review conducted by Koenig, McCullough, and Larson (2001) and evaluate if the relationship between private religious acts, in particular private prayer, and each of the dimensions of mental health to postulate whether or not there is enough evidence to state the existence of a relationship between the two variables. The review conducted by Koenig, McCullough, and Larson (2001) cites a plethora of research that investigates each area of mental health; ranked on a scale from one to ten.

On examination of the literature between religious activities such as private prayer and mental health, findings typically show associations that tend to be weak for cross-sectional and longitudinal studies (e.g., Koenig, Paragment, and Neislen, 1998). Conversely, there is a stronger association between intrinsic religiosity and anxiety (e.g., Baker and Gorsuch, 1982; Bergin, Masters, and Richards, 1987; Tapananya, Nicki, and Jarusawad, 1997).

The intention of the present chapter is to outline the studies presented in the review and to document the problems associated with each subsection. Additionally, the studies that are considered to be methodologically apt, will be evaluated and rated under A-Levels-of-Evidence approach.

Depression

Various studies have investigated the association of private religious activities, such as private prayer with measures of depressive symptoms. In general, such measures have been single-item indicators. McCullough and Larson's (1999) review would reported that most of the studies suggest that private religious activity maintains a tenuous relationship with depression. These reviewers note that most studies have found that zero-order and multivariate associations to be small, regardless of whether private religious activity is measured by a single-item or a multi-item measurement tool.

In the review by Koenig, McCullough, and Larson (2001), the reviewers comment that the relationship between private measures of religiosity, such as private prayer is 'not as strongly related to depression as are organisational religious activities or intrinsic religious commitment' (p. 135). The reviewers comment on seventeen studies that assessed the relationship between these two variables, with the ranking of the studies typically cited as average and above average in their overall design.

Average Publications (Rating 5-6)

The first ranking given by Koenig, McCullough, and Larson (2001) was 5-6, and within this subsection four studies were cited, cross-sectional in nature with varying levels of controls being employed. The sample utilised for the studies were diverse with results that were unequivocal.

All the studies within this subsection reported a lack of statistical significant association between private measures of religiosity and depression. For instance,

Koenig, Moberg, and Kvale (1988) examined a range of private measures of religiosity, such as private prayer, reading religious literature, and viewing religious television or listening to religious radio programs. These three measures were assessed in relation to depression for elderly adults (M= 74.4 years, SD= 7.5 years) in a geriatric assessment clinic. The absence or presence of depression was based on hospitalisation in the past 2 years with a psychiatric diagnosis. The finding from the analysis revealed that for the majority of the sample, private prayer at least once a day was reported for almost three quarters of the sample. In addition, it was reported that over one third of the sample reported listening to religious programs at least several times a month, and over one quarter of the sample reported that they read religious literature once a day or more. Over one quarter of the sample were diagnosed with depressive symptoms over the past 2 years. In relation to the variables under interest, it was reported that having a higher indication of private religious behaviour was related to an absence of depressive symptomlogy, this was not statistically significant.

This finding was also reported in a study examining psychiatric patients. The study performed by Neeleman and Lewis (1994) examined the relationship between a single item of private religious activity, 'How often do you practice your religion in private?', in a group of psychiatric patients and medical controls. The sample consisted of four groups of subjects, between the ages of 18-65. The groups came from newly referred patients from the Maudsley hospital outpatient clinic, which consisted of 26 deliberate self-harm patients, 26 depressed patients, 21 chronic schizophrenic patients, and 26 non-psychiatric outpatients of an orthopaedic centre. Additional data was obtained on demographic features, such as sex, age, ethnic group, socio-economic status, education, criminal convictions, personal history of depressive

symptoms, and a family history of depression. Findings from the study revealed that there were no significant differences between the control group and the psychiatric patients groups in relation to the religiosity measure, practicing religion in private.

Similarly, Schafer (1997) found no association between private measures of religiosity and depression in a sample of 282 college students. A 50-item distress scale measured the mental health variable and 1-item asking respondents to indicate how often they usually prayed. This item was utilised as one of the many religiosity measures. No control variables were utilised. Results from the analysis revealed that there were no significant differences between frequency of prayer and scores on the distress scale.

In addition, no association was reported in a sample of 156 bereaved persons (Sherkat and Reed, 1992). Depression was measured using an 18-item scale indicating symptoms related to the syndrome (e.g., crying spells, worthlessness, nervousness), the items were closely related to The Center for Epidemiologic Studies Depression Scale (Radloff, 1977). Private religiosity was measured by a single-item of frequency of prayer of mediation. Additional measured variables included three dimensions of social support (spending time with relatives and friends, confiding with friends and relatives, and quality of received social support). The analysis using least squares regression revealed that frequency of private prayer was not related to scores on the depression scale.

Considering the findings within this sub-section of the empirical research cited by Koenig, McCullough, and Larson (2001), the associations between private measures

of religiosity, typically private prayer appear to be unequivocal, that is the religiosity measures does not seem to be associated with depression. In terms of the systematic review strategy, A-Levels-of-Evidence approach, the studies are not considered adequate standard to be evaluated under the system; primarily because they utilised cross-sectional designs. Therefore, the evidence provided by the empirical research from this section is deemed as inconclusive; hence, they are eliminated from the systematic review process.

Good Publications (Rating 7-8)

Within the next subsection ranked by the reviewers (the studies cited as above average), there were six empirical studies, which all utilised cross-sectional designs but employed multiple controls in their analyses. The findings from the empirical research generally reveal mixed findings. Few studies within this sub-section revealed positive findings between the variables. For instance, Ai, Dunkle, Peterson, and Bolling (1998) investigated the role of private prayer for midlife and aged patients (40-81 years) who were recovering psychologically after cardiac surgery. The sample consisted of 151 patients, which underwent their first coronary bypass surgery. A questionnaire was received by patients one year after surgery, which included measures on psychological adjustment, measured by Symptom Checklist-90-R (Derogatis, 1983) and social support, which was measured by the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, and Farley, 1988). Religiosity, measured by private prayer, was employed for two specific events, using prayer as a coping mechanism (for guidance and strength) and utilising private prayer as a beneficial service beyond help delivered by the medical professions. Additional information on pre-surgery and post-surgery was obtained, which included; socio-

demographic, surgical, and medical information. Results from the analyses revealed that 68% of the sample utilised private prayer as a way of coping after surgery. In addition, a ANCOVA test revealed a significant main effect of private prayer for predicting a lower level of current general distress, $F(1,134)=8.4$, $p< .01$, this was reported after controlling for the effects of non-cardiac health conditions, first month depression, and social support.

Comparable findings were also revealed in a sample of black and white elderly persons living in a community area with the American South. The study performed by Husaini, Blasi, and Miller (1999) utilised data from 498 whites and 497 African Americans, on information including demographic characteristics, chronic medical problems, religiosity, social support, and depression. Depression was measured by the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and private religiosity was measured by a sum of frequency scores of a variety of activities (bible reading, praying only in times of crisis and need, tuning in religious broadcast programs, talking about religious topics with friends and family, and trying to convert someone). Findings from the regression analysis revealed that in model 1, private religiosity was related to scores on the depression scale for whites only ($\beta= -.10$, $p< .05$). However, when adding in variables that measured for medical problems and social stressors (model 2), private prayer was no longer statistically significant for whites, but it was significant for African Americans ($\beta= -.14$, $p< .05$). In the final model, adding in social support resulted in private religiosity remaining statistically significant for white and African American subjects, both at the $p< .05$ level.

Few empirical research publications show the negative relationship between private measures of religiosity and depression. For instance, Ellison (1995) examined a community sample of 1,865 white and 1,029 black residents from one urban county and from four rural counties in North Carolina, United States. The study utilised data from the NIMH Epidemiologic Catchment Area Program. The information obtained from the program included data on depressive symptoms, utilised from the Diagnostic Interview Schedule (Robins, Helzer, Croughan, and Ratcliffe, 1981) and a measure on private religious devotion, measured by a single-item asking respondents to indicate 'How often do you spend time in private religious activities, such as prayer, meditation, or bible study?' In addition, data was obtained on socio-demographics, such as race, gender, martial status, education, residence (urban or rural), income, chronic and acute stressors (illness and negative life events), and a measure of subjective social support. Findings from a zero-order ordinal least squares regression showed that religious devotion was positively related to depression (β= 0.06, $p<$ .001). This finding remained significant with the conclusion of multiple controls, such as gender, age, income, education, residence, marital status, stressors, and subjective social support (β= 0.046, $p<$ .001).

Some of the empirical research cited in the review revealed no relationship between private measures of religiosity and depression. For instance, no significant findings were found in relation to 83 nursing home residents aged between 51 years and 99 years (Commerford and Reznikoff, 1996). The study examined a general measure of private religious activity in relation to depression, as measured by the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961). In addition, demographic information was obtained, such as, age, gender, ethnicity,

education, occupation, choice of nursing home, and length of stay. Health items included self-rated health and mobility, and social support was measured asking respondents to indicate their perceived social support from friends and family. Results from the ANOVA showed that the general measure of private religious activities was not related to the depression scale.

Related findings were shown in a sample of medically ill hospitalised older adults, aged between 55-97 years (M= 68.4, SD= 8.7). The study performed by Koenig, Pargament and Nielsen (1998) included 577 elderly patients admitted to the inpatient services of the Duke University Medical Centre between January 1996 and April 1997. Data generated from the questionnaire included information on demographics and physical health. In relation to the variables of interest, religiosity was measured by a single-item question asking about frequency of private religious activities. An 11-item self-rated depression scale measured depression. The results from the analysis revealed that frequency of private religious activities was not related to depression.

Similarly, no significant findings were revealed between prayer and depression in a sample of middle-aged females who reside in the community in Gothenburg, Sweden (Hallstrom and Persson, 1984). The sample consisted of 460 women from four age groups 38, 46, 50, and 54. From this sample, the women were stratified into two groups, those with no major depression and no history of the illness (N= 400) and those with major depression (N= 60), and compared. The researchers examined many variables including socio-economic status, socio-demographics, social support, and a number of negative life stressors. Depression was classified by a semi-structured interview utilising the DSM-III. One aspect of religiosity measured, was frequency of

private prayer. A low-order analysis, controlling only for age, revealed that frequency of private prayer was not statistically significant to major depressive disorder between the two groups.

It can be seen from this sub-section, which assesses the relationship between private religious activities and depression that the relationship is one that is generally mixed, with no definite relationship appearing between the two variables for any particular group. Results from the studies revealed the lack of a significant association for the majority of the studies. Evaluating the publications under A-Levels-of-Evidence strategy, all of the above studies would be rated in the category C as they performed one of the major flaws that would cloud interpretation of the findings. The studies performed a cross-sectional methodology. Consequently, the evidence presented from the studies are inconclusive ruling out any potential conclusion being inferred surrounding the association between the two variables.

Excellent Publications (Rating 9-10)

The final subsection ranked excellent by the reviewers (categories 9-10), contained a small amount of studies (4). Half of the studies cited within this sub-section were of a cross-sectional design; however, half incorporated a longitudinal methodology. As with the previous section, the findings from these studies were unequivocal. The studies, both cross-sectional and longitudinal, stated a lack of an association between the two variables. The studies that presented no significant findings between different measures of private religious activities and depression were many. For instance, Koenig, Hays, George, Blazer, Larson, and Landerman (1997) investigated the modelling of the cross-sectional relationships between religion, physical health, social

support, and depressive symptoms in a sample of approximately 4,000 community-dwelling older adults. The sample were asked to respond to a variety of questions including demographics, frequency of prayer, mediation, and bible study and a question of frequency of watching religious television or listening to religious radio. Depression was measured by the 20-item Center for Epidemiologic Studies Depression Scale (Radloff, 1977). Results from the analysis revealed that the items measuring frequency of prayer and bible reading were not related to scores on the depression scale, but frequency of watching and listening to religious broadcasts was positively related, albeit weakly, to depression scores ($r = .03$, $p < .05$). However, when age, sex, race, health, and social support were controlled for in the analyses the association between watching and listening to religious broadcasts and depression weaken to non-significance.

Similarly, in a cross-sectional study, Strawbridge, Shema, Cohen, Roberts, and Kaplan (1998) illustrated that private religious activities was not related to depression, in a sample middle-aged and older adults (50-102 years). The sample consisted of 2,537 subjects who responded to numerous questions concerning religiosity, including a single-item instrument assessing how often they prayed and the first two items from the DSM-III-R major depressives episodes scale measured depression. In addition, information was obtained on life stressors and socio-demographics. Results from the study revealed that frequency of private prayer was not related to depression.

The findings from these two studies showed that private measures of religiosity were not associated with depression. However, the evidence for this conclusion came from cross-sectional data. Consequently, in relation to A-Levels-of-Evidence approach the

publications performed one of the major flaws that would prevent inclusion into the evaluation process of the review. The publications cited as excellent by Koenig, McCullough, and Larson (2001) receives the rating of C, denoting that the evidence is inconclusive. However, within this excellent category few studies did incorporate a longitudinal methodology.

The first study within this subsection to report on the relationship between private religious activities and depression was performed by Koenig, George, and Peterson (1998). The researchers utilised data from a sample of 87 patients admitted to the general medicine, cardiology, and neurology services of Duke University Medical Centre, who were screened for depression between November 1993 and April 1996. Information on a variety of variables were sought. For instance, depression was measured by the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and the Diagnostic Interview Schedule (Robins, Helzer, Croughan, and Ratcliff, 1981). Nonorganisational religiosity was assessed by asking respondents 'How often do you spend time in private prayer, mediation, or bible study?' Additionally, information was obtained on a number of exogenous variables, such as demographic characteristics, physical health, and social support. The researchers commented that private religious activities were not related to depression. However, there was no statistical analysis performed in the results sections.

The research performed by Koenig, George, and Peterson (1998) was not considered adequate standard to be considered for further evaluation by the systematic review approach. Although, the researchers commented on results from a longitudinal methodology, adequately measure the religious and health variable, and incorporates

numerous covariates, the researchers did not perform any statistical analysis between the variables of interest, private religious behaviours and depression. Subsequently, the publication gets rated in the C category, denoting that the methodology was not conclusive.

Validation of the nonsignificant association between these two variables has been substantiated by the findings from a longitudinal study investigating the relationship between religiosity and depression in a sample of older medical ill persons. The study performed by Musick, Koenig, Hays, and Cohen (1998) utilised data from the Duke Established Populations for Epidemiologic Studies of the Elderly. The total amount of respondents employed for the study was 3,007. At baseline, a variety of variables were examined including socio-demographics (gender, age, education, and martial status), social ties (social interaction and interaction satisfaction), physical health (functional impairment, cancer, and other illnesses), mental health (somatic-retarded activity, depressed affect, positive affect, and interpersonal relations), and religious behaviour (service attendance, religious devotion, and religious media). In relation to the variables under interest, depression was measured by the depressive affect dimension of the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), this dimension of the scale measures depressive affect by 5-items (α= .71). Higher scores on the scale indicated worse outcomes. After 2 weeks the samples were tested again on all measures.

At baseline, frequency data revealed that for both samples (black and whites), females were in the majority and the age range for the white and black sample was 64-100 years (M= 72.42, M= 72.75). Additionally, it was shown that the white sample had

more years in education, were more likely to be married, had greater social interaction, and better physical health than the black sample (all $p < .001$). In relation to the variables under interest, it was shown that there were significant differences between the black sample and the white sample on religious behaviour, with the exception of religious devotion. In terms of the depression variable, there were no significant differences between the two samples on scores of the depressed affect dimension of the depression scale. The observed relationship between the two variables revealed that for both samples private religious behaviours (private prayer and listening and watching religious programs) were not statistically related to scores on depressive affect, as measured by the Center for Epidemiologic Studies Depression Scale (Radloff, 1977).

The general conclusion that can be postulated from these findings, is that private measures of religiosity, in particular, private prayer is not related to measures of depression. In terms of A-Levels-of-Evidence approach, such a postulation may or may not be validated by following the stringent strategy of the systematic review. From the studies within this sub-section, the majority of them utilised cross-sectional designs, hence, are not of an adequate standard to be utilised as evidence for the review. The evidence they provide was inconclusive. However, within this subsection one of the studies met the criteria for inclusion. The study performed by Musick, Koenig, Hays, and Cohen (1998) reported that there was no significant association between the variables that measured private religious behaviours and depression. Due to the amount of information obtained on covariates, the publication gets rated under the mediated and independent model. In relation to both models the publication gets rated in the Category of A (ns). This rating indicates that the publication was

conclusive; although, the data does not support the hypothesis, which states that private religious behaviours protects against depression.

Regarding all the publications that have been cited in this section, it has been observed that the majority of them do not meet the minimal standards to be evaluated under the review process. All of the research was rated in the C category, with the exception of the latter publication. In relation to evaluating the strength of the hypothesis, private religious behaviour protects against depression, the publication does not offer any support for this proposition. The publication was rated in the A (ns) category; thereby, suggesting that there was conclusive evidence to suggest that that there was no association between the two variables. Subsequently, the hypothesis resulted in *consistent failures.*

Anxiety

Reviews assessing the relationship between private religious activities and anxiety, typically present a relationship that is weak (e.g., Larson, Pattison, Blazer, Omran, and Kaplan, 1986) and one that is mixed (e.g., Bergin, Masters, and Richards, 1987; Bergin, 1991). From these reviewers, it can be seen that the majority of the studies, which demonstrated a positive relationship between religion and anxiety have been conducted in adolescents and college students (e.g., Argyle and Beit-Hallahmi, 1975; Francis and Pearson, 1985).

In their most recent review, Koenig, McCullough, and Larson (2001) cited only six studies, which assessed the relationship between private measures of religious activities and anxiety. From the six studies cited, one of them was considered to be of poor quality in terms of overall design and received a rating of four.

Weak Publications (Rating 1-4)

The study conducted by Martin and Wrightsman (1965) examined the relationship between religious behaviour and death concern in a sample of 58 adult members of three churches, 33 members from the Church of Christ, 13 Methodist members, and 12 Christian Church members. Respondents indicated their frequency of personal prayer and provided a self-report scale that measured fear of death. Results indicated that personal prayer was not related to scores on the death anxiety scale.

The evidence from this sub-section on private measures of religious behaviour and anxiety would be considered as inconclusive by A-Levels-of-Evidence strategy. The study would be eliminated because it was of a cross-sectional nature and did not utilise controls in it analysis. Therefore, is rated in the C category.

Average Publications (Rating 5-6)

Within the next subsection, ranked average by the reviewers, two studies were cited. The methodology utilised within this subsection was of a cross-sectional nature. The findings from these two studies are not in agreement with each other; one of the studies presented an association between private measures of religious behaviour and the other study presented a relationship, which did not reveal a significant association, after controlling for covariates. For instance, Koenig, Moberg, and Kvale (1988) assessed in a cross-sectional study the relationship between non-organisational measures of religious behaviour (private prayer, reading religious literature, and viewing religious television or listening to religious radio programs) and chronic anxiety in a sample of 106 geriatric outpatients aged 55-94 years. Results revealed that for the whole sample there was no relationship between the three measures of

religious behaviour and the presence or absence of chronic anxiety, this finding remained when the sample was stratified for sex.

A contradictory finding was revealed in a sample of 266 black and Hispanic post-partum women age averaging 23 years old (Levin, Lyons, and Larson, 1993). The study examined the frequency of prayer exercised by pregnant mothers of low-birth weight babies. The respondents within the sample were asked a variety of questions concerning frequency of prayer before and during pregnancy, six items measuring subjective health before and during pregnancy, and several background characteristics. Frequency of prayer was measured by 'While you were pregnant, how often did you pray about your baby?' worry over health was measured by 'Right before you became pregnant did you worry about your health?' and 'During pregnancy, did you tend to worry about your health?' Additionally, data on a number of background variables were included, i.e., mother's age, martial status, gravidity, years of education, and self-rated religiosity. Zero-order correlations revealed that prayer was significantly related to worry over health before ($r = .21$, $p < .001$) and during ($r = .16$, $p < .05$) pregnancy. Therefore, it appears that respondents who worried about their health tended to pray more often than respondents who did not worry so often about their health. Further analysis revealed that as the frequency of prayer increased, there was greater worry over health during the pre-pregnancy stage ($F = 3.32$, $df = 264$, $p < .05$). However, when demographics, such as age, martial status, gravidity, education, and self-reported religiosity, were controlled, the results significance level diminished ($F = 2.25$, $df = 252$, ns).

The findings from these two studies would suggest that the relationships between private measures of religious activities are not associated with anxiety. In terms of A-Levels-of-Evidence approach, the studies could not be entered into the review as they fall short of one of the many criteria set out by the systematic review; they do not incorporate longitudinal designs. Consequently, the evidence is rated as inconclusive, and the publications are placed in category C.

Excellent Publications (Rating 9-10)

The final sub-section of this domain, the authors rank two studies in the excellent category (9-10). The empirical publications featured within the sub-section are once again of a cross-sectional nature. However, the findings from the research are predominantly concurrent. For instance, within the first study conducted by Koenig, Ford, George, Blazer, and Meador (1993) examined the relationship between religion and anxiety disorder in a sample of young, middle-aged, and older adults residing in a community. The findings presented revealed no significant associations between the variables. The researcher's utilised data collected by the Epidemiologic Catchment Area Survey (Blazer, Hughes, and George, 1987) on 2,969 persons aged 18 and over. The sample was broken down into three age categories, young (18-39 years, N=1,025), middle-aged (40-59 years, N=645), and older (60-79 years, N=1299). The information supplied by the study included, socio-demographic, social support, and health information. Anxiety was determined using the DSM-III criteria employing the Diagnostic Interview Schedule (Robins, Helzer, Croughan, and Ratcliffe, 1981). Diagnoses of the following anxiety disorders (6-months and life-time prevalence rates) were determined: simple phobia, social phobia, obsessive-compulsive disorder, panic disorder, agoraphobia, somatization disorder, post-traumatic stress disorder, and

generalised anxiety. Private prayer and bible reading and religious television viewing, where the two items that measured private religiosity. Results in relation to younger adults revealed that there were significant differences between low and high viewers of religious television and generalised anxiety disorder (5.3% vs. 13.5%, $p < .001$, respectively), after controlling for sex, presence of chronic illness, recent life events, and socio-economic status. In relation to the middle-aged, there was a statistical significant difference between respondents who reported they rarely prayed or read the bible and respondents who reported that they frequently prayed or read the bible, for 6-months prevalence rates of generalised anxiety (1.4% vs. 4.4%, $p < .01$), after controls. Therefore, it appears that there is a relationship between frequency of private religious behaviours and higher rate of generalised anxiety, within this sample of young and middle-aged respondents. However, when the results for the life-time prevalence rates of anxiety are viewed, there appears to be no significant differences for the three groups.

Comparable findings were viewed in the second study (Koenig, George, Blazer, Pritchett, and Meador, 1993). The research examined a sample of community-dwelling older adults (aged 60+), utilising data from Piedmont Epidemiologic Catchment Area survey (Blazer, Hughes, and George, 1987). The sample consisted of 1,299 adults who provided information on socio-demographics, mental health (6-beliefs. The Diagnostic Interview Schedule (Robins, Helzer, Croughan, and Ratcliffe, 1981) determined a range of anxiety conditions and private forms of religiousness was measured via 2-items, prayer and bible study and watching or listening to religious broadcasts. Results from the analysis revealed that private prayer or bible reading was not related statistically to any dimension of anxiety. However, in a zero-

order analysis, watching religious television or listening to religious radio was significantly related to anxiety symptoms (β= .13, p< .001), for 6-months prevalence rates. However, entering age, sex, race, and parental stability decreased the value slightly (β= .11, p< .01) but adding social support and martial status into the regression equation diminished the strength of the relationship to non-significance (β= .06, ns), for 6-month rates. There were no statistical significant results for the life-time prevalence rates of anxiety.

In the light of these findings, it can be postulated that there is no evidence to suggest that measures of private religious behaviour is related to anxiety. The publications that have been cited within this subsection do not meet the minimal methodological standards as set out by A-Levels-of-Evidence approach to infer a conclusion from the data. The reasoning behind failing the adequate standards by the review is that all the publications within this subsection cited by Koenig, McCullough, and Larson (2001), performed cross-sectional methodology. This presents one of the major flaws for exclusion. Consequently, the publications are rated in the category C.

Initially viewing the published articles cited by Koenig, McCullough, and Larson (2001) it was observed that the relationship between measures of private religious activities and measures of anxiety, were not significantly associated with each other. However, it must be noted that all the empirical research investigating this branch of religiosity and mental health, utilised cross-sectional design methodology. In examining the hypothesis that states, private religious behaviours protect against anxiety, it was viewed that within all subsections, none of the research was of good

enough standard to be evaluated. Consequently, the accumulated research reaches the level of *insufficient evidence*, indicating that more research is required.

Subjective Well-being

Empirical research has generally reported that prayer was positively related to reports of overall satisfaction with life (Poloma, 1993). High scores on the prayer index were found to be a important indicator of life satisfaction (e.g., Poloma and Pendleton, 1989), general happiness (e.g., Carp, 1974), and existential well-being (e.g., Poloma and Pendleton, 1991). Poloma (1993) states that 'This finding holds even when controls were set in place for common demographic factors (age, income, sex, education, and race) found to influence general perceptions of well-being' (p. 46). McCullough (1995) reported in a review of prayer and health that frequency of prayer predicts several indexes of subjective well-being. However, McCullough (1995) also commented on the concern over the ability to discern if this association is due to the effects of confounding variables (i.e., socio-demographics), which need to be controlled for in any analyses between the two variables.

In the review conducted by Koenig, McCullough, and Larson (2001) it was commented on that the vast majority of the studies, religious involvement was positively correlated with greater well-being. In a similar manner to the previous subsections, the reviewers ranked a number of studies according to how they rated their overall design.

Weak Publications (Rating 1-4).

From these publications within this subsection, only one study received the rating of one to four. The study conducted by Francis and Bolger (1997) found that there was no significant association between scores on a single item of prayer and scores on the Bradburn Affect Balance Scale (Bradburn, 1969) in a sample of 55 retired civil servants in Wales. However, the correlation between the two variables was in a positive direction (r = .17, ns). Due to the cross-sectional nature of the study, the publication cannot be utilised by A-Levels-of-Evidence approach, as this presents one of the major flaws leading to exclusion from the review process. Therefore, the study is rated in the category C.

Average Publications (Rating 5-6).

Koenig, McCullough, and Larson (2001) ranked eight studies in the five and six average category. The general findings from these eight publications are ones that are unambiguous. No relationship was reported between private religious measures and well-being within the publications in this subsection. All of the studies reported no association between private religious activities and well-being. For instance, Alexander and Duff (1991) examined 156 elderly persons on residential lists of life-care retirement communities (one populated with upper-middle class retired professional and the other populated by retired religious Christian service workers). Two items, one assessing how important religion was to the individual and the other assessing how often the individual engaged in private devotional behaviour measured private religious behaviour. Liang's (1984) version of the Life Satisfaction Index (Neugarten, Havighurst, and Tobin, 1961) measured subjective well-being. Findings revealed that private religious behaviours were not related to scores on the life satisfaction scale (r= .05, ns). Similarly, Sherkat and Reed (1992) reported that

frequency of private prayer or mediation was not significantly related to scores on a 3-item measure of self-esteem. This finding was also revealed in a sample of 84 caregivers providing care to Alzheimer's disease patients (Burgener, 1994).

Similarly, the finding of no significant association went beyond an elderly sample. For example, Benson and Spilka (1973) found no significant association between private religious devotion at home and self-esteem, measured by the first 23-items from Coopersmith's (1967) 50-item Self-esteem scale, in a sample of 128 males attending a Catholic high school.

The evidence provided by the publications within this subsection examining the relationship between private measures of religiosity and subjective well-being, are equivocal. It appears that the relationship is one which does not exist significantly. However, due to the cross-sectional methodological employed by the researchers, the evidence provided by the publications cannot be entered under the systematic review process. Therefore, the studies are ranked in the C (inconclusive) category.

Good Publications (Rating 7-8)

The subsequent subsection ranked seven to eight by Koenig, McCullough, and Larson (2001), contains a substantial amount of publications. From the nine studies within this subsection examining the relationship between private religious behaviour and subjective well-being, the results report on mostly positive associations. For instance, Koenig, Kvale, and Ferral (1988) examined the relationship between religion and well-being in later life. The sample consisted of 836 older persons aged 55 and over. The respondents replied to questions concerning their religiosity including three items

measuring private prayer, devotional reading, and religious television viewing or radio listening. These items were summed to provide a composite score for a measure of private religious behaviours. Subjective well-being was measured by the 22-item Philadelphia Geriatric Center Morale Scale (Lawton, 1972). Zero-order correlations revealed that the 3-items measuring private religious activities were positively related to scores on the morale scale ($r= .16$, $p< .01$). In addition, these findings remained robust when covariates (health, social support, financial status, age, and sex) were controlled in the analysis. However, when the analyses were stratified by sex, it was revealed that the significant associations only held for females and not males. Pollner (1989) reported that divine relations, which included an item on frequency of personal prayer was positively related to measures of global happiness ($R^2= .020$, $p< .01$), life satisfaction ($R^2= .023$, $p< .01$), life excitement ($R^2= .026$, $p< .01$), and marital happiness ($R^2= .004$, $p< .01$).

The publications to this point have presented results, which would show that the relationship between private measures of religiosity is positively associated with subjective well-being. However, the studies have typically employed 1-item or 2-item questions to measure the religiousness variable, typically employing a measure of frequency of private prayer. Although, researchers have recognised that prayer was ambiguous and poorly-defined phenomenon. Consequently, few researchers have developed psychometric measures that capture different forms of prayer and what individuals do when they pray. For instance, Poloma and Pendleton (1989), in addition to employing frequency of prayer, examined the relationship between a 15-item measure of types of prayer (meditative, ritualist, petitionary, and colloquial) and items on quality of life. The items measuring quality of life included measures on life

satisfaction, existential well-being, and happiness, in a sample, which consisted of 560 persons. Findings revealed that frequency of private prayer was negatively associated with scores on the happiness dimension of the quality of life scale (β= -.14, p< 05); however, this significance value was reduced when socio-demographics (education, sex, race, income, and age) were introduced into the regression equation (β= -.05, ns). In addition, it was revealed that colloquial prayer was positively associated with happiness (β= .15, p< .05), but this was reduced slightly when the socio-demographic covariates were controlled for (β= .14, p< .05). Medative prayer was also found to be positively associated with existential well-being (β= .13, p< .05), and this finding remained robust with the introduction of socio-demographics (β= .16, p< .05). No other variables were found to relate with one another. In a later study by Poloma and Pendleton (1991) on frequency and types of prayer, it was revealed through zero-order correlations that frequency of private prayer was positively related to life satisfaction (r= .09, p< .05) and existential well-being (r= .24, p< .001). In relation to types of prayer, zero-order correlations revealed that colloquial, meditative, and petitional prayer was positively associated with life satisfaction. All four forms of prayer were positively associated with existential well-being, and that colloquial and meditative prayer were positively associated with happiness. However, with the introduction of higher-ordered variables, it was shown that most of the relationships were reduced to non-significance, with the exception of frequency of private prayer (β= -.14, p< .05), which proved to be negatively associated with happiness when types of prayer were entered into the regression analysis. In addition, meditative prayer remained positively associated with existential well-being (β= .16, p< .05), regardless of the influence of socio-demographics.

In addition, there were a few studies that revealed that private religious behaviours, such as frequency of private prayer was negatively associated with measures of subjective well-being. For instance, Poloma and Pendleton (1989) assessed the relationship between frequency of private prayer and measures of subjective well-being in 560 persons. They reported that zero-order correlations revealed that frequency of private prayer was not related to scores on life satisfaction or happiness, but it was positively associated with scores on a measure of existential well-being ($r= .23$, $p< .05$). However, when other religious variables, such as church attendance, belief, and pray experience were controlled in a rank-order analysis, frequency of private prayer revealed a negative relationship with life satisfaction ($\beta= -.21$, $p< .001$) and with happiness ($\beta= -.20$, $p< .01$). Therefore, suggesting that the additional religious constructs may act as suppressor variables and that frequency of private prayer may have indirect associations with some measures of subjective well-being.

The evidence provided by the studies within this subsection, would show that private measures of religiosity, such as private prayer are mostly positively related to measures of well-being, albeit these gross associations reduced significantly whenever covariates, such as socio-demographics are introduced into the equation. In addition, it has also been revealed the beneficial effects of examining how different types of prayer are associated with well-being. However, the trouble with examining relationships between variables from cross-sectional studies is that it cannot be postulated whether the predictor variable is a cause or consequence of the criterion variable. In relation to the Levels-of-Evidence approach, the evidence offered by these publications cannot be advanced to the evaluation stage as they are of a cross-sectional design and hence receive the rating of C (inconclusive).

Unfortunately, few studies within this subsection, executed a longitudinal methodology. The first of these studies performed by Markides (1983) examined whether religiosity variables, including practice of private prayer, are related positively to positive adjustment (life satisfaction), regardless of the influence of other important predictors of adjustment and whether these relationships increase with time. The study was a 4-year prospective cohort survey of 338 (510 at baseline) of Mexican-Americans and Anglos aged 60 and over. The respondents indicated information on frequency of private prayer and positive adjustment. Positive adjustment was measured by the 13-item version of the Life Satisfaction Index (Neugarten, Havighurst, and Tobin, 1961). Results revealed that there were significant differences between Mexican-American men and Anglo men in frequency of private prayer at baseline and follow-up. Mexican-American men reported that they prayed more frequently in comparison with Anglo men. Additionally, it was found that private prayer was not related to scores on the satisfaction scale (β= .312, ns) at baseline for Mexican-American's only. However, when the follow-up scores were examined it was revealed that private prayer was not related to life satisfaction in an uncontrolled analysis (β= .749, ns), but when the effects of age, sex, marital status, years of school, and health was controlled for the association became significant (β= .928, $p < .05$).

The second publication utilised the same cohort as in the former study; however, the research examined the cohort over a longer period (8 years). The research performed by Markides, Levin, and Ray (1987) examined the same variables over 3-waves, which lasted 8-years. By the last follow-up, the sample was reduced to 230 persons

aged over the age of 60. Results from the study revealed that in a controlled analysis (i.e., controlling for ethnicity, sex, education, age, marital status, and functional health), private prayer was not related to scores on the life satisfaction scale for Mexican-Americans and Anglos at baseline and at the last follow-up. However, it was significantly associated, albeit weakly, at Time 2 for the 338 respondents available at the time ($\beta = .13$, $p < .05$).

Although, the studies utilised longitudinal designs, incorporated controls, provided statistical analyses, and adequately measured the religion and well-being variable; only one of the studies could be utilised for the systematic review process, as both studies use the same cohort. Consequently, the study that uses the longest period of time is included in the review. The rating that the second study would receive by utilising A-Levels-of-Evidence approach would be an A, meaning that the methodological of the study conducted by Markides, Levin, and Ray (1987) was conclusive, and no important methodological limitations were identified, which would cloud the interpretation. In this case, the publication would receive a rating of A (ns). This indicates that the data did not support the hypothesis.

Excellent Publications (Rating 9-10).

In the final subsection of this domain examining the relationship of private measures of religiosity and subjective well-being, Koenig, McCullough, and Larson (2001) cited a small number of publications (6) and rated them as being excellent. The findings from these publications generally revealed that private measures of religiosity typically did not have a relationship with subjective well-being. For instance, Ellison and Gay (1990) examined the relationship between frequency of

private prayer and life satisfaction among African-Americans. Data was obtained from 2,107 adults who were involved in the National Survey of Black Americans. Life satisfaction was measured by a 4-level global life satisfaction item; summed to provide a composite measure of life satisfaction. The researchers reported that frequency of private prayer was not associated significantly with life satisfaction (β= .013, ns), in a controlled analysis. Similarly, Levin, Chatters, and Taylor (1995) revealed that non-organisational religiosity, as measured by 4-items of private religious behaviour, was not significantly related to a 3-item measure of life satisfaction in a sample of 1,848 black Americans over the age of 18 (β= -.158, ns), in an uncontrolled analysis.

However, one study revealed that there were significant positive associations between the two variables. For instance, Ellison, Gay and Glass (1989) examined how devotional intensity, which included a measure of frequency of private prayer as well as an item on closeness to God, was related to four domain-specific measures of life satisfaction (each domain with 1-item measuring finances, health, family, and friends). In addition, the researchers utilised information on a variety of socio-demographic variables, such as marital status, number of traumatic life events, gender, occupational prestige, income, education, race, and area of residence (urban vs. rural). The sample consisted of individuals that lived in urban and rural communities, who were involved in the 1983 General Social Survey. Results revealed that devotional intensity was positively related to scores on the satisfaction scale (β= .12, $p< .01$).

The findings from these publications within this subsection would typically reveal that private religious activities, which included a variety of items that are intended to reflect private religious behaviours, have generally no associations with life satisfaction in samples of African-American adults dwelling within the community. Although, one study revealed that there was a positive significant relationship in a mainly white sample. However, the methodology incorporated within these publications are from cross-sectional designs, therefore, it is not possible to postulate whether religiosity is a cause or consequence of a given level of psychological functioning. Due to this limitation, the rating that the publications would receive within this subsection is C (inconclusive). Therefore, none of the publications within this subsection were deemed adequate for inclusion into the systematic review.

Examining all of the evidence from this section investigating the relationship between private religious behaviours and subjective well-being appears to present a relationship, which is equivocal. The research presents evidence that sometimes supports the proposition, whilst other research does not support the proposition. In evaluating the evidence under a objective and systematic review process, it was observed that the majority of the research did not meet the minimal methodological standards to be evaluated. However, in the subsection, which was rated as good, one published article was considered adequate standard. The rating that the publication received was A (ns). This finding suggests that the methodological of the study did not contain any methodological flaws that would cloud interpretation; however, the evidence does not support the hypothesis, private religious behaviours increase subjective well-being. Therefore, the evidence from this subsection reaches the level of consistent failures.

Conclusion

The aim of this chapter was to investigate the relationship between private religious measures and mental health, in particular private prayer. Levin and Taylor (1997) have commented that the most recognised and apparently, universal religious activity is prayer. It has been commented on that prayer is central to the religious lives of adults, regardless of religious affiliation (Levin and Taylor, 1997). With these suggestions surrounding the importance of prayer in the lives of many individuals, it is unexpected that there is a limited amount of survey research on the topic. Studies investigating the relationship between religiosity and mental health generally conclude that greater religiosity is associated with less mental ill health and higher levels of positive affect. Although, very few reviews have been performed on private religious behaviours and mental health, McCullough (1995) assessed this area and commented that the relationship between prayer and psychiatric symptoms (i.e., anxiety and depression) remains unclear, whilst the relationship with subjective well-being is a more favourable one. In a later review by Hackney and Sanders (2003), it was reported that personal devotion was inversely related to psychological distress (anxiety and depression), mean effect size = 0.11 ($p < .001$). In addition, it was reported that personal devotion was positively related to higher life satisfaction, mean effect size= .14 ($p < .001$).

In addition, Koenig, McCullough, and Larson (2001) 'systematically' reviewed the literature and found several associations between private religious behaviours and mental health. The authors concluded that in general there is a positive relationship that exists between personal devotion and mental health. However, in closer examination of the research that they cited, it was revealed that this was not

necessarily the correct claim. The research was subjected to a objective and systematic review process that had strict regulations to evaluate the methodological of the studies, before a judgement could be deduced from the data.

In examining each of the mental health issues, within the chapter, it was revealed that personal devotion was not as strongly related to mental health as postulated by Koenig, McCullough, and Larson (2001). For instance, assessing how private religious behaviours associated with depression, it was revealed that if there was a positive relationship, this usually diminished with the inclusion of covariates. Assessing the publications under A-Levels-of-Evidence strategy it was revealed that the majority of the research did not meet the minimal methodological standards to be evaluated. The majority of the studies were rated in the C category. However, one study performed by Musick, Koenig, Hays, and Cohen (1998) was rated by A-Levels-of-Evidence approach as being A (ns). This suggests that there was conclusive evidence to suggest that there was no association between the two variables. Subsequently, the hypothesis resulted in *consistent failures.*

Assessing the second mental health issue, anxiety, under A-Levels-of-Evidence strategy it was observed that none of the empirical research investigating this branch of religiosity and mental health met the methodological standards to be considered for further evaluation by the review process. Consequently, the accumulated research reached the level of *insufficient evidence.*

In the final category, examining personal devotion and subjective well-being it was revealed that the majority of research demonstrated that there was no association between the two variables, especially when multiple controls were included into the

analysis. Once again, he majority of the publications were rated in the C category, denoting that the research was of inadequate standard to be further considered for evaluation. However, one study within this section was considered adequate and was rated as A (ns). The study performed by Levin, Markides, and Ray (1996) provided conclusive support to suggest that there was no support for the hypothesis, private religious behaviours increases subjective well-being. The level of evidence reached *consistent failures*.

Examining the three mental health issues within this chapter, leads to the conclusion that the relationship between personal devotion and mental health is not as warranted as Koenig, McCullough, and Larson (2001) have declared. Utilising a systematic review process, the research in the sections investigating depression and subjective well-being would suppose that there is no evidence to support the existence of a relationship. However, these conclusions were drawn from the evidence of one study in each section, it can be postulated that this small quantity does not justify such a conclusion. However, it can be suggested that past reviews including the one by Koenig, McCullough, and Larson (2001) have been overly optimistic surrounding claims on the relationship. However, greater quantities of high-quality research are needed.

6 Private Religious Activities and Physical Health

Introduction

The subject to be explored within this present chapter is the relationship between private religious behaviours and physical health. The facets of physical health that will be investigated are that of all-cause mortality, heart disease, and hypertension. There has been little research performed that have investigated these areas. However, the small amounts of findings have generally led reviewers to comment on the positive nature of personal devotion on physical health.

It has been suggested that prayer, either independently or in concert with God may improve physical health (e.g., Finney and Malony, 1985; Martin and Carlson, 1988). The scientific mechanisms that explain the efficacy of prayer include the stress reduction of mediation and the social support offered within a religious group activity (e.g., Oman and Reed, 1998). The properties produced by the meditative effects of praying can clearly create stress-reducing results, such as lower blood pressure or increase in immune functioning (e.g., Koenig, Cohen, George, Hays, Larson, and Blazer, 1997; Levin and Vanderpool, 1989). Consequently, these positive physiological conditions are believed to manufacture a state of good health.

Various cross-sectional studies have shown that those who are sick or more disabled pray more (e.g., Courtenay, Poon, Martin, and Clayton, 1989; Koenig, Moberg, and Kvale, 1988). This finding agrees with Krause and Van Tran's (1989) suppressor model of religiousness, which theorises that religion is used as coping device in times of crisis.

The present chapter will re-assess the few studies that Koenig, McCullough, and Larson (2001) have cited in this domain and evaluate the data under A-Levels-of-Evidence approach in order to observe whether the relationship between the two variables are justified.

All-Cause Mortality

Koenig, McCullough, and Larson (2001) cited little empirical research, which examined the relationship between private measures of religiosity, in particular private prayer, and all-cause mortality. There has been little research that has investigated these variables specifically. In the extensive review conducted by Koenig, McCullough, and Larson (2001), two studies were cited, which were considered excellent by the reviewers.

Excellent Publications (Rating 9-10)

Two studies were cited by Koenig, McCullough, and Larson (2001), which were considered to be of excellent quality excellent. The two studies within this sub-section utilised longitudinal studies and employed multiple controls within their analyses. The first study cited was performed by Helm, Hays, Flint, Koenig, and Blazer (2000) who utilised data from the Duke University Established Populations for Epidemiologic Studies of the Elderly. This 6-year prospective cohort study consisted of 3,851 respondents at baseline (1986-1987) aged 65+. Private religious activities were assessed by the question 'How often do you spend time in private religious activities, such as prayer, mediation, or bible study?' Responses available were (1) never, (2) a few times a week, (3) once a week, (4) two or more times a week, or (5) daily (or more often). Demographic variables included age, gender, ethnicity, and education.

Physical health variables included chronic conditions and impaired daily activities, as well as self-rated health. Mental health measures included depression, as measured by the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and self-reported negative life-events in the year before baseline. Six measures of social support were employed and questions on health practices were utilised. Vital status was assessed through annual follow-up, with dates of death confirmed by abstracting death certificates. At the final follow-up, 1,137 subjects died (29.5%).

Results from the analyses revealed that those respondents who reported rare participation in private religious activities were more likely to die during the follow-up period than those who did not, but this association disappeared for the group as a whole once known risks for mortality were included (RH 1.08, 95% Cl 0.90-1.30). However, the results revealed that private religious activities provided a protective effect against mortality for an elderly population free of functional impairment, even after controlling for demographics and health variables (RH 1.63, 95% Cl 1.20-2.21), and this effect persisted after further controlling for explanatory variables, including health practices, social support, and other religious practices (RH 1.47, 95% Cl 1.07-2.03).

Comparable findings, in relation to the lack of association between private measures of religious devotion and all-cause mortality, were revealed when the researchers controlled for numerous covariates. Idler and Kasl (1992) performed a prospective cohort study on 2,812 persons over the age of 65, living independently in the community of New Haven, Connecticut. Data was collected at baseline (1982) and followed continuously at one-year intervals until 1989). The sample were asked to

respond to a variety of questions on religiosity, functional disability, general phsycial health status, depression, a host of demographic characteristics (age, education, sex, race, and perceived income adequacy) and intervening variables, health practices (smoking, alcohol consumption, exercise, and body mass index) and indicators of social networks (the number of people seen frequently, number of close friends and family members). Private religiosity was measured by single-item requesting respondents to indicate their self-reported religiousness and did they receive strength and support from religion. The rate of mortality was noted from obituaries, hospital records, and proxy information and was verified by obtaining death certificates.

In relation to private forms of religiosity and mortality, findings revealed that there was no association between private religiousness with mortality for men when health status in 1982 was controlled. Controlling only for health status, there was a reduced risk for mortality for women, but this disappeared when socio-demographic factors (age in particular) were controlled.

The studies that were cited within this subsection were of excellent quality, employing longitudinal designs, multiple controls, and statistical analyses. The methodology conducted by the empirical researchers of these publications met the standards to be evaluated under the systematic review. The first study performed by Helm, Hays, Flint, Koenig, and Blazer (2000) reported that there was a positive association between personal devotion and mortality. People who reported that they performed more frequent prayer, mediation, or bible study were more likely to be dead. In relation to the systematic review process, the study would be rated under the independent model as it did not utilise the proper controls (socio-demographics) to be

evaluated under the mediated model. Due to the flaw the publication was rated as B (positive), denoting that the methodological was generally sound and the data supported the hypothesis.

The second publication performed by Idler and Kasl (1992) reported that there were no association between the two variables. The study performed by these researchers were of high-quality and gets rated under the category of A for both the mediated and independent models. However, the data does not support the hypothesis, private religious behaviours protects against mortality. It can be deduced that the evidence from the publications assessing this domain reaches the level of consistent failures.

Heart Disease

As in the previous section, Koenig, McCullough, and Larson (2001) cited few empirical research articles that assessed personal devotion and heart disease. This domain was a relatively new area of investigation. In the review conducted by Koenig, McCullough, and Larson (2001), few studies assessed the relationship between these two variables.

Excellent Publications (Rating 9-10)

The two publications cited by the reviewers were rated in the excellent category, ranking nine and ten. The first study, conducted by Gupta (1996) examined lifestyle factors in conjunction with coronary heart disease in a sample of 3,397 rural and urban Indian men. Information about the cohort was obtained, which included family history of coronary heart disease, history of various lifestyle factors, such as education, family structure, family-type, housing, type of job, presence of stressful

life-events, personality type, depression, prayers and yoga, and major cardiovascular risk factors, i.e., smoking, alcohol intake, amount of physical activity and diabetes. The prevalence of anginal chest pain, hypertension, and obesity was also determined.

Frequency data revealed that there was a high prevalence of smoking, alcohol consumption, non-vegetarian diet, absence of prayers, no leisure time activities, and obesity. This was particularly prevalent within the rural sample. Results between coronary heart disease and lifestyle factors revealed that there was a significant association between the two variables. In relation to prayer/yoga and coronary, it was revealed that there was a significant difference (χ^2= 80.28, p< .001). However, this was more prevalent in the rural than the urban men.

A later study conducted by Gupta, Prakash, Gupta, and Gupta (1997) on the prevalence and determinants of coronary heart disease in a rural population of India found similar findings. The study consisted of both male and female participants from rural communities in the North-West Indian state of Rajasthan. Information was obtained on family history of hypertension and coronary heart disease, social factors such as education, housing, type of job, stressful life events, depression, and participation in religious prayer and yoga. Details on conventional risk factors were also obtained, such as smoking, alcohol intake, amount of physical exercise, diabetes, and hypertension. The full sample size consisted of 3,148 persons (1,982 males, 1,166 females). Analysis of lifestyle factors showed that religion, martial status, occupation, family structure, alcohol intake, and dietary habits were not significantly associated with coronary heart disease prevalence. However, when the sample was stratified for age it was revealed, by odds ratio (95% confidence intervals) that prayer habit was

significantly associated with coronary heart disease prevalence in men only, 0.28 (0.08-0.91), p< .05, this remained significant when the analysis was adjusted for age 0.26 (0.08-0.86), p< .05, and the effect remained significant when the analysis was adjusted for the addition variables in the equation (age, education, smoking, sedentary habits, body-mass index, systolic and diastolic blood pressure, hypertension, and cholesterol), 0.28 (0.08-0.95), p< .05.

The studies cited within this subsection revealed that prayer habit and/or yoga participation were related to prevalence of coronary heart disease in a sample of rural men in India. However, the publications cited by Koenig, McCullough, and Larson (2001) did not meet the minimal methodological standards to be evaluated by A-Levels-of-Evidence approach. The two publications contained the flaw of not performing longitudinal designs. Due to this methodological flaw, the studies are rated in the category of C, denoting that the methodology was inconclusive. Consequently, the support for the hypothesis, private religious behaviours protects against heart disease, reaches the level of *insufficient evidence.*

Hypertension

Supporting the trend for few empirical studies to be conducted that assess the relationship between personal devotion and physical health; this section is no exception. The review conducted by Koenig, McCullough, and Larson (2001) cited few publications that assessed the relationship between private religious activities and hypertension. The reviewers rank these two studies as average and above.

Average Publications (Rating 5-6)

The first study, conducted by Koenig, Moberg, and Kvale (1988), received a rating of six by the reviewers. The research examined the relationship between religious activities, including a measure of private religious behaviour, and the prevalence of chronic physical health, such as hypertension in a sample of older adults, aged 65 years and over (M= 74.4, SD= 7.5). The sample consisted of 106 geriatric outpatients in Illinois, who completed a questionnaire; information collected consisted of data on socio-demographics, such as sex, age, race, financial status, martial status, living situation, education, smoking, alcohol consumption, and a variety of physical and mental health variables. Three items requiring respondents to indicate how often they participated in private prayer, reading religious literature, and viewing religious television or listening to religious radio programs, measured private religious behaviour. Hypertension was measured by two or more blood pressures of 160/90mmHg or greater, or those respondents who were receiving antihypertensive treatment. The results from the analysis revealed that there was no relationship between the absence and the presence of hypertension and the latent variable, private religious behaviour, as measured by the three frequency items. This result remained robust when the sample was stratified by sex.

The evidence from the study performed by Koenig, Moberg, and Kvale (1988), would suggest that the relationship between the two variables is a positive one. However, when utilising the systematic review process it is possible to suggest that the evidence from the publication does not meet the minimal requirements to be evaluated, due to the researchers performing a cross-sectional design and not incorporating a host of controls within their analysis. The publication within this subsection would receive the rating of C (inconclusive); hence, not being considered for further evaluation.

Excellent Publication (Rating 9-10)

The second study, which received a rating of nine by Koenig, McCullough, and Larson (2001), investigated the relationship between religious activities and blood pressure in older adults. Koenig, George, Hays, Larson, Cohen, and Blazer (1998) conducted a longitudinal study on a sample of 2,391 persons over the age of 65. The examined the relationship between a variety of religious behaviour measures, including frequency of private prayer, mediation, or bible study, with measures of blood pressure. Blood pressure was measured by two procedures; firstly, by self-report in which participants indicated if their doctors had told them if they had high blood pressure. Secondly, blood pressure was measured using systolic and diastolic blood pressure readings. In addition, the respondents at baseline (1986) replied to a variety of questions concerning demographic characteristics (age, sex, race, and education), physical functioning, smoking behaviour, and body mass index. This information was also obtained at wave II (1989-1990) and wave III (1992-1993) of the longitudinal study.

The findings from the analysis revealed that participants who prayed or studied the bible at least daily were significantly more likely to be told that they had high blood pressure by their physician than those who were less involved in such activities (52% vs. 48.9%, $p < .05$). This finding was robust at all three waves. However, when the analysis was controlled for the other covariates, particularly gender, the associations did not retain their significance.

The evidence provided by the publication, within this subsection, reports that there is no association between the two variables, especially when the analysis is controlled for covariates that are known to influence the relationship. In relation to A-Levels-of-Evidence strategy, the publication is considered adequate standard to be evaluated. The rating that the publication would receive is A (ns), for both the mediated and independent models. This rating indicates that there is conclusive evidence to postulate that there is no support for the existence of a relationship between personal devotion and hypertension. Consequently, the evidence reaches the level of *consistent failures.*

Conclusion

The suggestion projected by most researchers and reviewers surrounding the relationship between religion and health, is that the former provides a protective factor against the latter. In relation to personal devotion, such as private prayer, and physical health, it has been observed that a dearth of research has been performed within this area.

The extensive review conducted by Koenig, McCullough, and Larson (2001), reported that there were few empirical studies that assessed the area of personal devotion, such as private prayer and physical health topics. However, the published studies that were in existence have been subjected to A-Levels-of-Evidence strategy.

In examining the evidence for the first hypothesis, private religious behaviours protect against mortality, it was shown that there was no support for the hypothesis. The publication cited within this section was rated in the category A (ns). This rating

denotes that the publication provided conclusive evidence demonstrating that there was not any support for the hypothesis. Consequently, the evidence reaches the level of *consistent failures.*

In addressing the second hypothesis, which states that private religious behaviours protects against heart disease, it was observed that the available evidence did not meet the minimal methodological standards to be evaluated by the review process. Assessing the accumulated research in the area under A-Levels-of-Evidence strategy, it was demonstrated that the publications were rated in the category C, indicating that they contained a flaw that would cloud interpretation of the data. Consequently, the support for the hypothesis, reached the level of *insufficient evidence*, indicating that further research of an adequate standard was required.

The final section within the present chapter addressed the hypothesis, which stated that private religious behaviours protected against hypertension. From the two publications that could be evaluated in this domain, one of the studies (Idler and Kasl, 1992) performed adequate research for evaluation. The study did not provide any support for the hypothesis; however, it was rated in the category C. This rating indicates that the evidence from the publication is conclusive. Consequently, it can be deduced that the conclusion from the data reaches the level of *consistent failures.*

In addressing these three physical health issues, it can be viewed that there is few research articles in existence, which each of the domains. Due to the dearth of research to be evaluated, it would be too hasty a decision to infer a conclusion on each

of the hypotheses stated. However, it can be suggested that more high-quality research is required.

7 Psychometric Measures and Mental Health

Introduction

The principal theme to be explored within this chapter is the relationship between psychometric measures of religiosity and mental health. The review conducted by Koenig, McCullough, and Larson (2001) assesses this theme with respect to a range of mental health issues. Hence, the intention of this chapter is to present their findings and to re-evaluate the studies that the reviewers have cited within this domain. Consequently, this chapter will critically evaluate the research conducted on mental health (anxiety, depression, and well-being). The empirical research that will be examined will be evaluated under A-Levels-of-Evidence strategy in order to observe whether the relationship between the two variables are justified as declared in Koenig, McCullough, and Larson (2001) most recent review and whether there is enough evidence presented from the empirical research to communicate if a potential relationship is likely to exist.

It can be observed from the literature that early studies assessing the relationship between religion and health utilised single-item measures that simplified the multifaceted concept of religiosity. Subsequently, researchers have been led to examine religiousness by employing multi-item measures, which examine certain aspects of this concept. It has been observed that specific measures of religiosity typically produce clearer results than the more general descriptors like religious affiliation (Payne, Bergin, Bielema, and Jenkins, 1991). Using one or two-item questions, as a measuring battery for what is supposed to signify religiousness, has been claimed to be the ultimate trivialisation of the religiousness variable (Lawrence, 2002).

Generally, measures of religious motivation employed in research of this nature consist of Allport and Ross's Religious Orientation Scale (1967) and Hoge's Intrinsic Motivation Scale (1972). Allport and Ross's Religious Orientation Scale consists of two elements, extrinsic and intrinsic orientations. The extrinsic orientated individual is defined as

> "A person who endorses religious beliefs and attitudes and engages in religious acts only to the extent that they might aid in achieving mundane goals, such as feeling comforted and protected or acquiring social status and approval" (Hill and Hood, 1999).

Subsequently, extrinsicness reflects the maladjusted use of religion as a means to an end. In contrast, the intrinsic religious orientated individual is classified as someone who is motivated to engage in religious acts and who has strong beliefs because their religious tradition sanctions these goals and beliefs. Therefore, the intrinsic scale theoretically measures an adaptive stance in which religion serves as the end around which an individual organises his/her life. Although, there has been occasions within research examining religion and health that has simply constructed measures, which consisted of the affiliated, behavioural, and attitudinal constructs of religiosity.

The existence of a relationship will be explored by utilising A-Levels-of-Evidence strategy adopted by Powell, Shahabi, and Thoresen (2003). In utilising this approach, allows for an objective and systematic evaluation of the empirical research cited by Koenig, McCullough, and Larson (2001); hence, permitting the communication of the strength of the evidence for the hypothesis (i.e., is there enough evidence to postulate if religiosity as measured by multi-itemed measures is related to mental health).

Depression

In past research, it was observed that religion generally had salutary effects on depression when single-item measures were utilised. However, these associations were typically weak, which is not surprising, since, single-item measures with three or four response options usually contain low amounts of variance (Schmidt and Hunter, 1996). Similarly, when research was employed that utilised single-item measures of religious salience it was reported that these measures were good predictors of reduced symptoms of depression (e.g., Rabins, Fitting, Eastham, and Zabora, 1990). For instance, Ross (1990) employed measures of religious preference, strength of religious belief, and content of beliefs as predictors of psychological distress, as measured by symptoms of depression and anxiety. A single-item question measured strength of religious belief, asking respondents to identify if they considered themselves a strong, somewhat strong, or not very strong affiliate, to their religion. From the results, Ross (1990), reported that strength of religious belief was associated with reduced depressive symptoms in a community sample of Illinois residents (β= -.12, $p < .05$) after controlling for covariates.

Similarly, in a longitudinal study, Braam, Beekman, Deeg, Smith, and van Tilburg (1997), reported one year from baseline, respondents who indicated that a strong religious faith was "not important" in their lives (low religious salience) were almost three times more likely to become depressed than those who indicated high religious salience; however, this was not statistically significant. Nevertheless, these researchers found that among 48 respondents who were depressed at baseline and reported low religious salience were almost six times more likely to experience depression in comparison with those who indicated high religious salience.

Even when the relationship between religious salience and depression is in a positive direction, the associations are weak and sometimes not demonstrating statistical significance. Subsequently, over recent years, researchers preferred to employ multi-item measures that are believed to capture the 'religiousness' concept. These measures typically examined religious motivation or religious attitudes and beliefs. For instance, cross-sectional research has demonstrated that extrinsic religious orientated individuals usually have elevated symptoms of depression (e.g., Watson, Ghorbani, Davison, Bing, Hood, and Ghramaleki, 2002). However, it has been reported that intrinsic orientates suffer from less depressive symptomology (e.g., Genia, 1993; Genia and Shaw, 1991; Watson, Ghorbani, Davison, Bing, Hood, and Ghramaleki, 2002; Watson, Hood, Foster, Shelly, and Morris, 1988).

The review by Koenig, McCullough, and Larson (2001) cited a number of studies (44), which employed psychometric measures of religiosity in their research examining the relationship between religiousness and depression.

Weak Publications (Rating 1-4)

From the eighteen publications cited by the reviewers, one received a ranking of one to four, which indicated that the research was of poor quality. The one study within this category revealed that intrinsic religiosity was inversely related to depression. The study performed by Ryan, Rigby, and King (1993) examined the relationship between religious orientations and mental health. The study performed by Ryan, Rigby, and King (1993) consisted of two samples; the first sample consisted of 151 students from two Christian colleges, the second sample was composed of 42 adults

from a Sunday school class. The participants from the two samples filled out a measure on mental health (General Health Questionanire-28; Goldberg and Hillier, 1979), the Religious Orientation Scale (Allport and Ross, 1967), and the Alternative Orientations: Means, End, and Quest scale (Batson and Ventis, 1982). Results showed that in sample one, individuals who indicated that they were intrinsically orientated on the Allport and Ross (1967) scale, reported lower scores of depression, as measured by the depression dimension of the health questionnaire ($r = -.23$, $P < .01$). However, there were no significant correlation between individuals who reported an extrinsically orientation and depression. In relation to Batson and Ventis (1982) scale, it was shown that only individuals who scored high on the 'End' component of the scale, intrinsically orientates, the lower they scored on the depression dimension of the health questionnaire ($r = -.24$, $p < .01$). In relation to the second sample, the 42 Protestant Sunday school attendees, there were no significant correlations between religious types and depression.

The findings from the study would appear to support the hypothesis that intrinsically orientated individuals tend to score lower on depression dimension of the health questionnaire. However, in terms of the systematic review process, the study cannot be entered due to a flaw (i.e., performed cross-sectional designs). Therefore, the evidence is deemed as inconclusive and is rated in the category C, as stated by A-Levels-of-Evidence approach.

Average Publications (Rating 5-6)

The reviewers cited a substantial amount of publications in the second sub-section (ranking 5-6). Koenig, McCullough, and Larson (2001) rated fifteen studies as being

average in their overall design. The findings from the subsection were generally equivocal. It was reported that some religious types experience the salutary relationship between religiosity and depression, whereas some religious types experience the detrimental relationship between religiosity and depression. Typically, the findings from the publications demonstrated that whilst intrinsically orientated individuals have inverse associations with scores on depression scales, extrinsically orientated individuals are either positively related with scores on depression scales or not associated with scores on a depression scales. For instance, Nelson (1989, 1990) revealed a positive association between intrinsic types and depression in a sample of 68 non-institutionalised elderly individuals ($r = -.23$, $p < .05$), there were no significant association between extrinsic types and depression, in an uncontrolled analysis. Religious orientation was measured by the Religious Orientation Scale (Allport and Ross, 1967), and depression was measured by the Geriatric Depression Scale (Yesavage, Rink, Rose, Lum, Huang, Adey, and Leirer, 1983). O'Connor and Vallerand (1989) validated these findings in a sample of 176 elderly French-Canadians drawn from nursing homes; intrinsically orientated types were inversely related to depression ($r= -.34$, $p< .001$), in an uncontrolled analysis.

In examining adult samples, Genia and Shaw (1991) reported in a sample of 309 adults, ranging in age from 17 to 83, a negative correlation between intrinsically orientated individuals and depression ($r = -.20$, $p< .001$) and a positive correlation between extrinsically orientated individuals and depression ($r = .24$, $p<. 001$). Religious orientation was measured by Religious Orientation Inventory (Allport and Ross, 1967) and depression was measured by the Beck Depression Inventory (Beck and Beck, 1972). In a later study, utilising the same cohort, Genia (1993) reported that

intrinsic types were negatively associated with depression ($r = -.18$, $p < .01$), whilst extrinsic types were positively associated with depression ($r = .24$, $p < .001$), after controlling for age, sex, and education.

In a study partially assessing religious orientation with depression, Watson, Hood, Foster, and Morris (1988) reported that intrinsic religiosity was correlated with lower depression score, whilst, extrinsic religiosity appeared as a largely maladjusted orientation. The sample consisted of 314 respondents, 198 of whom attended a public university and 116 attendees of a private Pentecostal college. All respondents completed a questionnaire booklet that contained the Depression-30 Scale (Dempsey, 1964), Costello and Comrey's Depression Scale (1967), and Allport and Ross's Religious Orientation Scale (1967). Results from the bivariate correlations for the religious college sample revealed that individual's with intrinsic orientations correlate negatively with scores on the depression scales (Dempsey-30 Depression Scale, $r = -.36$, $p < .001$; Costello-Comrey Depression Scale, $r = -.39$, $p < .001$). However, with the state university sample, results reveal no significant associations, for the Dempsey Depression Scale ($r = -.10$, ns) but a small significant association for the Costello-Comrey Scale ($r = -.18$, $p <. 05$). Those respondents who were reported as being extrinsic, were found to be moderately associated with depression, however these results proved to be non-significant with the exception of extrinsic religious orientation with the Demspey-30 Depression Scale ($r = .20$, $p < .05$). However, no control of covariates was performed on the correlations. These results were validated in a later study performed by Watson, Morris, and Hood (1989) on 157 volunteers from undergraduate Introductory Psychology classes at the University of Tennessee at Chattanooga. Intrinsic religious orientation scores were inversely associated with

depression ($r = -.20$, $p < .05$) and extrinsic orientates were positively associated with scores on depression ($r = .14$, $p < .05$). The typical feature of these two studies is that the results come from analyses, which did not incorporate controls.

The majority of publications, within this subsection, reported on the differing directions of the associations between orientation types and depression, some publications reported that there was no association between the religiosity and depression. For instance, in examining an adult sample, Spendlove, West, and Stanish (1984) reported that scores on Hoge's Intrinsic Motivation scale (Hoge, 1972) were inversely related to scores on the Beck Depression Inventory (Beck, 1979); however, this relationship disappeared when education, caring from spouse, health, and income were controlled.

In a later study, Brown and Gary (1987) reported no relationship between religiosity, as measured by a 13-item scale devised by Kennedy, Cromwell, and Vaughan (1979), and scores on the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), in a sample of 451 African American adults aged 18 and over. Similarly, Grosse-Holtforth, Pathak, Koenig, and Cohen (1996) reported no significant association between religious orientation types and depression in sample of 97 mostly institutionalised elderly hospital patients.

This lack of a significant association, between psychometric measures of religiosity and depression, has also been found in a sample of 106 older adults in a geriatric assessment clinic (Koenig, Moberg, and Kvale, 1988). The researchers found that religiosity as measured by 4-items relating to orthodox Christian beliefs were not

significantly associated with depression, measured by a diagnosis on the patients' medical records. Grosse-Holtforth, Pathak, Koenig, Cohen, Pieper, and Vanhook (1996) found no significant associations between religious beliefs, as measured by a 22-item measuring religious belief as 'God concept' (Gorsuch, 1968), religious motivation, as measured by the Intrinsic/Extrinsic Religiosity-Revised Scale (Gorsuch and McPherson, 1989) and depression, in a sample of 97 medically ill veterans.

Although, the religion-health association has been well documented amongst causcians, little is known about the relationship amongst a sample of African-Americans. Brown, Ndubuisi, and Gary (1990) examined this inequality within the literature by explore the relationship amongst a probability-based sample of 451 urban black Americans. The researchers employed questionnaires that included a psychometric measure on religiosity (α= 0.88), a ten item modified version of the scale developed by Kennedy, Cromwell, and Vaughan (1977) and depression (Center for the Epidemiologic Studies Depression Scale; α= 0.84), developed by the National Institute of Mental Health (1977). Results showed that depressive symptoms were lower at higher levels of religiosity for both males and females.

The evidence from the publications cited by Koenig, McCullough and Larson (2001), within this subsection, would appear to denote a relationship that is partially mixed. In terms of the instrinsical orientated individual, the direction of the relationship with depression, is usually negative. Intrinsically orientated types experience the salutary relationship of religiosity on depression. In relation to the extrinsically orientated individual, the direction of the relationship with depression is often positive. Extrinsically orientated religious types experience the detrimental relationship of

religiosity on depression. However, when the publications are assessed under A-Levels-of-Evidence strategy, the publications are rated as C (inconclusive) and are not further considered for evaluation. The reasoning behind this is that the typical foundations for this conclusion come from cross-sectional designs and according to the systematic review process the methodology is flawed.

Good Publications (Rating 7-8)

There was only one publication that was considered to be of good quality to receive a rating of seven to eight by Koenig, McCullough, and Larson (2001). The study performed by Commerford and Reznikoff (1996) was a cross-sectional survey of a convenience sample of 83 cognitively unimpaired elderly adults. Commerford and Reznikoff (1996) examined the relationship between depression and intrinsic religiosity in 83 nursing home residents aged between 51-99 years (M=80.68, SD= 10.48). Depression was measured though the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961) and religious orientation by the Intrinsic Religious Motivation Scale (Hoge, 1972). A correlation coefficient showed that scores on the Intrinsic Religious Motivation Scale were negatively correlated with the Beck Depression Inventory (Beck, 1979); however, the correlation was not significant. It was found that the best predictors of depression where self-esteem and health.

Koenig, McCullough, and Larson (2001) rated this publication as having a good overall design and although, it utilises multiple controls in the analysis the publication is cross-sectional, presenting one of the flaws of A-Levels-of-Evidence approach, prohibiting the publication being utilised for further consideration for evaluation.

Subsequently, in terms of evaluating the evidence under A-levels-of-Evidence strategy, the empirical research within this subsection, would receive a rating of C, which means that the evidence is inconclusive.

In examining all the subsections assessing the relationship between religiosity, as measured by psychometric instruments, it was observed that there were no studies that met the minimal methodological requirements to be evaluated under the systematic review process. All of the empirical studies cited by Koenig, McCullough, and Larson (2001) were all rated in the C category, indicating that the methodology was inconclusive and not considered for further evaluation.

Anxiety

The empirical research investigating the relationship between anxiety and religiousness is generally mixed, with some research demonstrating the positive associations between the two variables, some the negative associations, whilst other research reports that there is no associations. In an early review, Argle and Beit-Hallahmi (1975) described that the studies assessing the domain of religion and anxiety is typically mixed: religious students are more anxious and maladjusted, but those who participate in religious activities are better adjusted.

It has been suggested that this mixed relationship between religion and anxiety is partially explained by looking at the simplistic definitions of religion (Gorsuch, 1976). Over the past few decades, research has begun to differentiate religion by distinguishing between intrinsic and extrinsic commitment, or between those who see religion as an 'end' and those who use their religion as a 'means' (Allport and Ross,

1967). Although, research has begun to assess this multi-dimensional construct by psychometric measures, results from the empirical studies tend to demonstrate mixed findings.

The review performed by Koenig, McCullough, and Larson (2001) cited 79 empirical studies that assessed the relationship between religiousness and anxiety. From these seventy-nine empirical studies, almost one fifth of the studies investigated the relationship through multi-item and often multi-dimensional measures of religiosity. Koenig, McCullough, and Larson (2001) commented on how religion tends to buffer against anxiety, especially intrinsic religiosity.

Weak Publications (Rating 1-4)

In the review, Koenig, McCullough, and Larson (2001) cited 20 studies that specifically incorporated a multi-item measure of religiousness within its methodology. From the twenty publications, few were considered to be of a weak design; hence, received a rating of one to four. From the findings of these three publications, it was reported that intrinsic religiosity was inversely related to anxiety, whilst extrinsic religiosity was positively related to anxiety. For instance, Baker and Gorsuch (1982) examined the relationship between trait anxiety and intrinsic/extrinsic religiousness. The study consisted of 52 college students who responded to measures of religiousness, i.e., Intrinsic-Extrinsic Religious Orientation (Allport and Ross, 1967) and a measure of anxiety, i.e., IPAT Anxiety Scale (Scheier and Cattell, 1960). Bivariate correlations revealed that intrinsic orientated types were moderately correlated with lower scores on the anxiety measure ($r = -.33$, $p < .05$) and extrinsic orientated types were moderately correlated with higher scores on the anxiety

measure (r= .35, p< .01), these analyses were uncontrolled. Similar findings were reported by Kraft, Litwin, and Barber (1986) reported that individuals with an intrinsic religious orientation was related to lower scores of death anxiety (r= -.30, p< .001) and individuals with an extrinsic religious orientation were related to higher scores of death anxiety (r= .42, p< .001).

The final study within the subsection, Ryan, Rigby, and King (1993) reported mostly no associations in two separate samples of students. The first sample consisted of 151 students from a Protestant Christian college and sample two were 42 subjects at an adult Sunday school class. The participants filled out self-report questionnaire, which included a variety of measures including, the General Health Questionnaire (Goldberg and Hillier, 1979), Religious Orientation Scale (Allport and Ross, 1967) and the Alternative Orientations: Means, End, and Quest (Batson and Ventis, 1982). The religious measures were correlated with a health questionnaire. In relation to the anxiety dimension of the questionnaire, it was revealed that in the first sample scores on the intrinsic dimension of Allport and Ross' (1967) orientation scale were inversely related to the anxiety dimension of anxiety (r= -.23, p< .01). In addition, it was reported that scores on the End dimension of Batson and Ventis (1982) scale were also inversely related to scores of anxiety (r= -.24, p< .01). However, there were no associations with the other dimensions of the religiosity scales and anxiety. In the second sample, there were no significant associations recorded.

On initial examination of the studies, assessing religiosity types and anxiety, it would appear that individuals who report an intrinsic orientation towards religion report lower scores of anxiety and individuals who report an extrinsic orientation towards

religion report higher scores of anxiety. However, the publications that have been cited by Koenig, McCullough, and Larson (2001) contain flaws that make it impossible to infer concrete conclusions, as the methodology is weak. The publications incorporated cross-sectional designs and did not employ controls within the analyses. Utilising controls, such as age, sex, and socio-economic status may help to explain the observed relationship. Regarding these flaws, the publications are rated in the category C, which represents evidence that is flawed and inconclusive. Subsequently, they do not get further consideration for the evaluation.

Average Publications (Rating 5-6)

It appears that the majority of the publications assessing the relationship between psychometric measures of religiosity and anxiety fall within this subsection. The findings from the empirical research are typically mixed. Some research stated that religiosity was inversely correlated with anxiety. For instance, Sturgeon and Hamley (1979) reported that intrinsically orientated religious people reported less anxiety than extrinsically orientated religious people ($t= 3.801$, $p< .01$), in an uncontrolled analysis. In a later study this finding was substantiated, Thorson and Powell (1990) reported in a sample of 345 college students, who indicated responses to Hoge's (1972) Intrinsic Religiosity Scale and Nehrke's (1973) Death Anxiety Scale, that there were significant differences between high intrinsic orientates and low intrinsic orientates for the majority of the items on the Death Anxiety Scale. In addition, it was demonstrated that there were significant differences between high and low religious orientates and responses on the total score for the Death Anxiety Scale ($t= 5.64$, $p< .01$). In another sample of college students, Schaefer and Gorsuch (1991) reported that scores on the Intrinsic-Extrinsic Religious Motivation Scale (Gorsuch and

McPherson, 1989) were inversely related to scores on an anxiety scale, among 161 college students.

In assessing medical patient samples, similar findings were demonstrated,that is religiosity was inversely related to anxiety. For instance, Koenig, Moberg, and Kvale (1988) reported these findings amongst a sample of 106 elderly medical patients. The 106 participants received a questionnaire containing an 88-item religiosity measure that contained questions extracted from four instruments created by Glock and Stark (1965), Hoge (1972), Palutzian and Ellison (1982), and Princeton Religion Research Center (1982). Chronic anxiety was determined by reviewing the patient's medical record. Results from the analysis revealed that for the entire sample, there were no significant differences between the presence and absence of chronic anxiety for individuals who reported high or low intrinsic religious orientations. However, when the group was stratified by sex, it was demonstrated that women with chronic anxiety reported lower levels of intrinsic religiosity than women without chronic anxiety ($z= 1.70$, $p< .05$). In another medical sample, Bivens, Neumeyer, Kirchberg and Moore (1994-1995) reported that intrinsic religiosity was inversely related to measures of death concern in a sample of 167 medical patients with HIV or AIDS.

Similarly, research within this domain also reported on no association between religiosity and anxiety. For instance, Templer and Dotson (1970) reported no association between religiosity and death concern in a sample of 213 college students. This finding was substantiated in a later study; Frenz and Carey (1989) reported that amongst 175 college students, there were no association between trait anxiety and

Feagin's modification of Allport's Intrinsic-Extrinsic Religious Orientation Scale (Feagin, 1964).

The majority of studies within this subsection assessing the relationship between psychometric measures of religiosity, in particular religious motivation, and anxiety, general reveal a mixed relationship. The studies revealing a positive association between the two variables typically state that intrinsic types are inversely related to scores on anxiety measures and extrinsic types are positively related to scores on anxiety measures. However, validating this supposition with the studies within this subsection is not possible, as the represent studies with weak methodology. For example, in terms of the systematic review, which evaluates research that meets the minimal methodology standards, the publications here do not meet the criteria to be included. The evidence that they present is deemed to be inconclusive, due to the cross-sectional nature of the research, and thus the studies receive a rating of C. Although, there was one study within this subsection, which did meet the criteria for further evaluation by A-Levels-of-Evidence review process.

Good Publications (Rating 7-8)

Few studies within this subsection were rated as being good quality by Koenig, McCullough, and Larson (2001). The results from the two publications cited in this category typically report that religious motivation is related to anxiety. For instance, Leming (1980) reported that religiosity was significantly and inversely related to fear of death in 372 residents of Northfield, Minnesota. Similarly, Tapanya, Nicki, and Jarusawad (1997) reported significant inverse associations between Allport's concept of religious orientation (Gorsuch and Venable, 1983) and worry, measured by the

Penn State Worry Questionnaire (Meyer, Miller, Metzger and Borkovec, 1990) in sample of 104 elderly persons (52 Christians and 52 Buddhist). Results showed that individuals who reported an intrinsic religious orientation reported lower levels of worry ($r = -.21$, $p < .05$), controlling only for gender. This finding was especially true in Buddhists ($r = -.37$, $p < .01$).

The evidence provided by these publications reported that individuals, who report that they have an intrinsic religious orientation, typically suffer from less anxiety. However, the studies that represent this subsection contain the usual methodological flaws that are inherent in much of the research within the domain assessing religion and health, for example, the findings come from cross-sectional studies and do not incorporate the potential influence of intervening variables. Although, latter study controlled for gender, much research has demonstrated the effects reducing the strength and the significance of a correlation by adding in socio-demographic characteristic (i.e., age, race, and socio-economic status). Therefore, in terms of evaluating the evidence under A-Levels-of-Evidence strategy, the two studies cited within this subsection, would receive a rating of C, which denotes that the evidence is inconclusive.

As with the publications examining religiosity and depression in the previous section, this present section, does not contain any studies that would be considered for evaluation by A-Levels-Of-Evidence strategy. The researchers performed cross-sectional designs, which prohibit the ability for the empirical study to advance through the review process.

Subjective Well-being

The relationship between religiousness and psychological and subjective well-being has been the focus of considerable debate. Early research has (e.g., Campbell, Converse, and Rodgers, 1976) found negative associations between the two variables. However, more recent research (e.g., Ellison, Gay, and Glass, 1989) suggests that religion may contribute to subjective well-being.

Koenig, McCullough, and Larson (2001) cited fourteen studies assessing this domain. The reviewers rated the cited publications from one to ten, indicating that the quality of the research ranges on a spectrum from poor to excellent.

Weak Publications (Rating 1-4)

In relation to this subsection, the reviewers perceived one study to be of poor quality. The results from this publication showed positive findings. The study conducted by Ryan, Rigby, and King (1993) surveyed two separate samples. The first sample was 151 Christian College sample and the second sample was 42 Protestant Church members. Both samples were indicated to provide responses to two religiosity questionnaires, Allport and Ross' (1967) Religious Orientation Scale and Batson and Ventis' (1982) Alternative Orientations: Mean, End, and Quest Scale. The outcome variable, self-esteem was measured by the Multidimensional Self-Esteem Inventory (O'Brien and Epstein, 1987). Results from the analysis demonstrated that Allport's and Ross' (1967) Intrinsic Dimension and Batson and Ventis' (1982) End dimension was positively related to scores on the self-esteem inventory ($r = .25$ and $r = .24$, $p < .01$, respectively), in a uncontrolled analysis, for the 151 Christian College sample. There were no other significant associations.

The finding from this publication revealed that religiosity was positively related to self-esteem. However, examining the publication under A-Levels-of-Evidence strategy the publication contains many flaws that would prevent evaluation by the approach. The first major flaw was that the researchers performed cross-sectional methodology and did not incorporate the utilisation of controls. Therefore, due to these limitations the publication is rated in the category C, denoting that the evidence from the research is inconclusive.

Average Publications (Rating 5-6)

Koenig, McCullough, and Larson (2001) report on substantially more publications within this subsection that investigates the domain of psychometric measures of religiosity and subjective well-being. The general conclusion that can be postulated from this subsection, is that the relationship between psychometric measures of religiosity with subjective well-being is generally mixed. Some publications demonstrate that a positive relationship exists. For instance, Wickstrom and Fleck (1983) reported in 130 college students that extrinsic religiosity was inversely related to self-esteem ($r = -.16$, $p < .05$), whilst intrinsic religiosity was positively related to self-esteem ($r = .20$), but not significantly.

Similar findings were reported in elderly samples. For instance, Heisel and Faulkner (1982) reported in a sample of older black Americans that religiosity, measured through experiential, ritual, and consequential constructs, were statistically related to some measures of personal adjustment. It was reported that there were differences between respondents who scored high on the religiosity scale, scored high on the

scales of self-acceptance (χ^2= 9.26, P< .05), life satisfaction (χ^2= 11.10, p< .05), and seeing themselves as good people (χ^2= 15.31, p< .01).

Similar findings were reported by O'Connor and Vallerand (1989), who examined the relationship between religious motivation and life satisfaction amongst 176 elderly French-Canadians. Religious motivation was assessed (intrinsic religiosity, self-determined extrinsic religiosity, nonself-determined extrinsic religiosity, and amotivational religiosity) by a scale developed by the investigators. Results revesled that intrinsic religiosity was positively related to life satisfaction (r= .25, p< .001), self-esteem (r= .30, p< .001), and meaning in life (r= .31, p< .001), in an uncontrolled analysis.

Similarly, some researchers reported that religiosity as measured by psychometric instruments was not associated with well-being. For instance, Blaine and Crocker (1995) reported no association between King and Hunt's (1975) Religiosity salience-Cognition Scale and self-esteem in 144 undergraduate students.

Chamberlain and Zika (1988) surveyed 188 women involved in a study of personality factors and well-being. The women provided information on their self-reported well-being, which was obtained by two scales that measured life satisfaction and positive and negative affect. In addition, the women indicated responses to a religiosity scale measuring religious salience. Results showed that religious salience was not correlated with positive or negative but it was correlated positively with life satisfaction (r= .17, p< .05). However, this finding diminished to nonsignificane with the inclusion of purpose and meaning of life. Comparing terminally ill and healthy

individuals, Reed (1986) reported that there were no significant differences between religiosity and well-being for both groups.

The publications within this subsection demonstrate the inconsistent nature of this relationship. Some of the publications report positive findings, whilst others report that there is no association. In examining the publications under A-Levels-of-Evidence strategy, it can be observed that the publications within this subsection do not meet the minimal methodological requirements to be evaluated. Consequently, the publications are rated in the category C, denoting that there methodology is inconclusive. This rating indicates that there the data reached the level of *insufficient evidence* for the hypothesis, religiosity, measured by psychometric instruments, increases subjective well-being.

Good Publications (Rating 7-8)

Koenig, McCullough, and Larson (2001) cited few studies in the category rating publications as being good in their overall design. Overall, there were four studies that were rated in this domain, all of which present an image that suggest that individuals who indicate an intrinsic orientation to religiosity tend to report greater subjective well-being. For instance, Reed (1987) surveyed 300 adults with and without terminal illness. The sample was split into three groups, which were matched on age, gender, years of education, and religious background. Results revealed that there significant positive associations between religiosity scores and well-being scores, only for the terminally ill patients ($r = .22$, $p < .05$, uncontrolled).

This positive association can be observed in elderly samples. For instance, Koenig, Kvale, and Ferrel (1988) examined the relationships between intrinsic religiousness and well-being in 836 persons aged 55 or over. Results revealed that intrinsic religiosity was positively related to morale ($r = .24$, $p < .01$). After the authors controlled for the effects of physical health, social support, and financial status, relationships with morale remained significant (correlations ranging from .23 to .25, all $p < .01$).

However, with this subsection, one study did not find any association between intrinsic religiosity and self-esteem. Commerford and Reznikoff (1996) cross-sectionally surveyed 83 cognitively capable elderly residents of nursing homes and reported that intrinsic religiosity, as measured by Hoge's Scale was not correlated significantly with self-esteem.

The findings from the publications within this subsection suggest that religiosity, as measured by psychometric instruments, is positively related to measures of subjective-well-being. However, subjecting the studies to A-Levels-of-Evidence strategy, the research would be placed in the C category and regarded as inconclusive as the studies utilised cross-sectional designs.

After re-evaluating the studies with this domain, it was observed that the conclusions offered presented mixed results. Utilising an objective strategy to evaluate the studies it was possible to establish, which of the studies meet the criteria of acceptable methodological standards. From the fourteen studies cited by Koenig, McCullough, and Larson (2001), none of the publications were considered of adequate standard to

be evaluated. All of the cited publications were rated as C (inconclusive). This rating indicates that there the data reached the level of *insufficient evidence* for the hypothesis, religiosity, measured by psychometric instruments, increases subjective well-being.

Conclusion

In reviewing the early literature on religion and health, it has been noted that the majority of the studies did not explicitly set out to study religion, rather it was found in studies of health outcomes, one or more religious indicators made a serendipitous "guest appearance" alongside a host of other psychosocial variables. Therefore, the confounding effects of other variables were not controlled for, making inferences about the sole effects of religion on health difficult to establish. Additionally, when studies did treat religion as an independent construct tended, in the most part, to measure religion only as a matter of either affiliation or attendance. Researchers have criticised the utilisation of religious affiliation and church attendance as tools to assess the religiousness of individuals. It has been proclaimed that "these constructs are inherently limited as indicators of religion, since each corresponds to Allport's "institutionalised" category" and also "the usual measures of each of these constructs suffer from certain methodological flaws threatening their validity" (Levin and Schiller, 1987, p. 13).

Koenig, McCullough, and Larson (2001) comment on a moderate amount of empirical studies that assess the domain of religiosity, measured by psychometric instruments and mental health. The findings from the majority of the research into this area has been mixed, with some studies presenting a positive finding, whilst other

research has presented findings that state no association exists between the two variables. In examining the publications under an objective and systematic process, it was observed that none of the research in each of the mental health sections met the minimal methodological standards for evaluation. All the publications cited were paced in the category C, denoting that they do not get further consideration for evaluation. Therefore, the publications examining this aspect of religiosity and the three topics of mental health (depression, anxiety, and subjective well-being) reach the level of *insufficient evidence.* Reaching this level of evidence indicates that more reach is required.

8 Conclusion

The aim of the present thesis was to investigate whether or not the claims regarding the association between religion and health, both mental and physical, were as favourable as suggested by academics investigating the field. Since, psychologists have become interested in the area there has been a number of reviews that have been undertaken to assess conclusions from the empirical research. In terms of the reviews on mental health, one early meta-analysis, Bergin (1983) found an overall mean correlation of .09 between religiosity and 'better mental health'. Bergin's (1991) review on religiosity and mental health demonstrated that evidence shows average (not dramatic) positive effects of the religion on mental health. Larson, Sherrill, Lyons, Craigie, Thielman, Greenwold, and Larson (1992) reported that of the 50 studies they reviewed that reported relationships between religious commitment and mental health, 36 reported a positive relationship, 8 reported a negative relationship, and 6 reported a neutral relationship between the two variables.

In relation to the reviews conducted on physical health, one of the first reviews Levin and Schiller (1987) reported on over 250 published empirical studies assessing the area and concluded that the weight of evidence supports the proposition that there is positive association between religion and better physical health. A subsequent review, Troyer (1988) focusing on studies of cancer in Mormons, Adventists, Amish, and Hutterites, came to the same general conclusion. A third review conducted by Jarvis and Northcutt (1987), which gave careful scrutiny to a subset of studies that examined mortality, also concurred. Levin (1994) critiqued past reviews and concluded that on the basis of the evidence, there does appear to be an association.

Recently, one of the most extensive and comprehensive reviews has been conducted. The review performed by Koenig, McCullough, and Larson (2001) commented on over 850 articles that assessed the relationship between religion and mental health and over 350 articles that assessed the relationship between religion and physical health. In reviewing these articles the authors commented that, within the literature, the evidence points to the protective effects that religiosity asserts on both the mental aspects of health and the physical entities in health. At the end of the review, Koenig, McCullough, and Larson (2001) conclude by stating that

> 'In the vast majority of the cross-sectional studies and the prospective cohort studies that we identified, religious beliefs and practices rooted with established religious traditions were found to be consistently associated with better health and predicted better health over time' (p.591).

However, few researchers have refuted these conclusions drawn by Koenig, McCullough, and Larson (2001). For instance, Sloan and Bagiella (2001, 2002) argue that the relationship between religion and health is of doubtful value. These authors have suggested that the empirical studies that have documented the positive effects of religion on health are hopelessly flawed and of no scientific value. However, it should be noted that the evidence which these authors are basing their conclusions come from only 24 of the approximately 325 studies which examine religion and physical health. Additionally, the researchers have not conducted any reviews on mental health. Consequently, it can be suggested that these pessimistic conclusions are empirically unfounded.

More recently, some researchers have performed more objective and systematic reviews to evaluate the strength of the association. For instance, Powell, Shahabi, and Thoresen (2003) performed a systematic review, based on the Cochrane method, on

the religiousness concept and facets of physical health and commented that the 'Thus we tend to agree with Sloan, Bagiella, and Powell (1999) that past reviews may tend to be overly optimistic, but we tend to clearly disagree with their conclusion that suggestions that religious activity will promote health are unwarranted. Rather, we think that this conclusion is premature and that the intriguing evidence to date warrants continued and careful investigation' (p. 50). However, these authors only utilised empirical research that examined the relationship between religion and physical health and, in addition, evaluated the data under a general hypothesis (e.g., religion protects against mortality), rather than examining the data under more specific hypothesis (e.g., denomination protects against mortality). Furthermore, the researchers did not utilise any of the empirical research to assess the claims surrounding religion and mental health. Subsequently, the purpose of the present thesis was to examine the associations between the religion and health association utilising the systematic method (A-Levels-of-Evidence approach). The thesis employed the research cited by Koenig, McCullough, and Larson (2001) and generated more specific hypotheses to assess the claims regarding the association. It was generally found that there was not enough high-quality research for an evaluation to be performed on the majority of the health issues.

It can be observed by the levels of evidence given to each topic on religion and health, that few sections provide conclusions from the data. Although, there is an extensive amount of research performed on most areas, the majority of the empirical studies do not meet the minimum methodological standards to be evaluated. One of the major flaws believed to cloud interpretation of the results is the cross-sectional nature of the

research. Much of the research concerned with the relationship between religion and health is characterised by cross-sectional designs, rather than the more conclusive longitudinal designs. The advantage that longitudinal studies have over the former is that they consist of follow-up periods of sufficient length in which the ability to detect changes in health, could be accomplished after the collection of the baseline data. Cross-sectional data does provide an initial assessment of the manner in which variables relate with one another, test hypotheses in at least a preliminary fashion, and afford information that can be used to develop and design future longitudinal studies capable of determining causality. Although cross-sectional designs allow the establishment of an association between variables under investigation to be made, it cannot identify dynamic changes in health over time. With a few exceptions, most of the studies that exist in this area utilised cross-sectional designs in which the religious variable and health status is measured simultaneously-whereas a certain level of good health can be either a cause or consequence of religion. Cross-sectional designs are unable to determine the temporal sequence of events. Although, it is preferred that longitudinal studies be conducted as they provide information on the direction of causation, they still cannot eliminate the possibility that some third variable (i.e., genetics) may be responsible for the observed relationship that has not been measured or controlled. Subsequently, in an effort to employ the experimental method, researchers have attempted examine the experimental effects of prayer on illness.

Over recent years, research has begun to assess not only the relationship between prayer and physical health but an onset of experimental studies has begun to examine the power of prayer on illnesses. For example, Benson (1975, 1984) has demonstrated the impact of secular and spiritual forms of prayer on blood pressure. Dossey (1995)

in a review that examined dozens of scientific studies looking at the power of prayer concluded that prayer is a factor that is important in the healing process, which is not limited by the issues of time and distance.

This area has received a great deal of attention over the recent years, particularly from the latter part of the 1980's. As a result, researchers have been led to examine experimentally the healing effects of prayer, and generally, it has been reported that a relationship does not exist. For example, Walker, Tonigan, Miller, Corner, and Kahlich (1997) conducted a pilot study on the effects of intercessory prayer in the treatment of alcohol abuse and dependence and found that intercessory prayer did not demonstrate clinical benefits in the treatment of alcohol abuse and dependence. These findings are similar to several additional studies that failed to find a statistically significant effect of intercessory prayer on various medical conditions in adults and children (Collipp, 1969; Elkins, Anchor, and Sandler, 1979; Joyce and Weldon, 1965; O'Laoire, 1997). McCullough's (1995) literature review on prayer and health, claimed that the research prior to 1983 which assessed the effects of intercessory prayer on the ill (Collipp, 1969; Galton, 1872; Joyce and Welldon, 1965) were unimpressive in their design and remarkably equivocal in their results.

Byrd's (1988) double-blind clinical trial, in which patients, physicians and the author remained unaware throughout the study to which patients were assigned to each condition, was the most notable study on the effects of intercessory prayer at the time. The study examined the effects of intercessory prayer on 393 patients admitted to a coronary care unit for acute coronary distress; this investigation is a better-designed study in comparison to the subsequent investigations that attempted to clarify how this

form of prayer may promote healing. Of the 393 patients who agreed to participate in the study over a 10-month period, 192 where randomly assigned to receive prayer from a Christian intercessory prayer group that met outside the hospital. The remaining 201 patients did not receive prayer. Patients were assessed on 29 health variables. Multivariate analysis confirmed that the equivalence of the two groups before treatment. The study was unable to report any differences between the intercessory prayer and no-prayer groups in length of stay in the intensive care unit, days in hospital, mortality, or number of medications at discharge. However, a relationship was observed following treatment and during the hospitalisation period. Multivariate analysis showed the two groups to differ on the health measures, and follow-up analyses indicated that the patients for whom the prayer group interceded had fewer instances of congestive heart failure, cardiac arrest, and pneumonia; as well, fewer of the patients in the prayer condition requiring diuretics, antibiotics, or ventilatory assistance.

Although, Byrd reported statistically significant differences between the measures, no effect sizes were reported, so meaningful interpretation of the data is limited. Also, it was only 6 out of the 29 outcome measures that the experimental and control groups differed in, thus raising the question of why prayer seemed to be only effective for certain outcomes. The differences between the two groups could be accounted for within the statistical analyses as fewer participants belonged to the experimental group than the control group. In addition, the study did not control for any psychosocial (i.e., socio-economic status, social support) or psychiatric health-related variables (i.e., depression, stress) that may have helped or hindered recovery. Furthermore, even if the idea of a supernatural intervention can be offered as an

explanation, a further criticism can be made; as remarked by the researcher, there were no measures implemented to control for people outside the study praying for the patients or for the patients praying for themselves.

Since Byrd's (1988) study, a small number of researchers have carried out similar studies in the hope to assess the healing effects of prayer. For instance, Harris, Gowda, Kolb, Strychacz, Vacek, Jones, Forker, O' Keefe, and McCallister (1999) attempted to replicate Byrd's findings by testing the hypothesis that patients who are unknowingly and remotely prayed for by blinded intercessors will experience fewer complications and have a shorter stay in hospital than patients not receiving such prayer. These researchers randomised 990 patients into two groups, 466 into the prayer group, and 524 into the control group. Results from this study showed by using severity-adjusted outcome scores, coronary care unit patients randomised to the prayer group had lower overall adverse outcomes compared to the usual care group. However, a 10% difference in a P value of .04 is not a robust challenge to the null hypothesis. In addition, patients in the two conditions did not differ statistically in length of stay in hospital. Although, these researchers controlled for patients' expectancy their study does include a few limitations. For instance, in this study, the researchers did not perform multivariate analysis before the study started; therefore it is possible that the patients in the experimental group and control group differed before treatment. In addition, the researchers created the measurement technique used to assess improvement; consequently, the results reported for the between-group differences could be a cause of measurement error (Matthews, Conti, and Sireci, 2002). Consequently, the outcome variable was not theoretically and conceptually grounded or differentiated.

A major concern elicited by Hammerschmidt (2000), in conjunction with the statistical procedures performed in the study, was that these researchers used a t-test as a way to compare the results on a clinical outcomes scale. Such scale values are not ordinary number-line numbers in their representation of clinical severity; no researcher in any clinical sense can claim that one unit increment within the scale for one patient means the same for another patient. Hammerschmidt (2000) continues by arguing that without having any form of uniformity, ordinary arithmetic does not work, and a test such as the t-test provides inaccurate results.

Conversely, this detail could be ignored if the differences between the groups were large or if the statistical significance was great, but as previously noted this was not the case.

Matthews, Conti, and Sireci (2002) rectified one of the limitations of the previous study by using ten medical based dependent measures that are typically used in evaluation of patients with end-stage renal disease (the condition under study). In addition, these researchers utilised four self-report measures, including the Short Form-36 Health Questionnaire (Ware and Sherbourne, 1992), the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961), and the Brief Symptom Inventory (Derogatis, 1983), these measures are robust, reporting sound validity and reliability. The fourth measure constructed for primary use within this investigation was the Belief in Prayer/Positive Visualisation Questionnaire. The investigation consisted of 95 adult subjects from the outpatients' centre, who volunteered to take part in the experiment. The researchers informed 47 participants

that they were to receive intercessory prayer and 48 participants to receive positive visualisation. However, in order to provide a fair test of the expectancy hypothesis separate from actual treatment, the researchers manipulated the conditions so that one-third of each treatment group received no treatment at all, this was unknown to the participants.

Findings from the investigation show that a small significant main effect was found for expectancy, that is subjects expecting prayer reported feeling better than those subjects expecting positive visualisations. In order to reduce the occurrence of a type I error, the alpha level was reduced to $p < .003$, similarly, there were no statistical significant main effects or interactions for either the expectancy or treatment conditions for both medical measures or self-report psychological measures. However, having such a stringent alpha level increases the occurrence of a type II error. As a result, the researchers found it necessary to examine the effect sizes for each of the treatment comparisons. As a result, the mean effect size found for each of the computed treatment contrasts failed to indicate even a small effect size. This was also true for the effects of expectancy on the medical measures. No noteworthy effect size was reported for each of the conditions were subjects expected and received intercessory prayer versus expected without receiving intercessory prayer. Similarly, no effect size was reported for the group who expected and received positive visualisation versus the expected (without) group, and finally, the expected intercessory prayer versus the expected positive visualisation group had comparable results.

This finding was also reported when comparing the expectancy groups using the self-report psychological measure that is the effect size was at a level not sizeable enough to report, with the exception of the third contrast, in which a small effect size was indicated. Therefore, partial support for hypothesis was substantiated. Subjects who expected to receive intercessory prayer showed a greater response on the dependent measures than subjects who actually received intercessory prayer. However, the investigation did not support the effectiveness of intercessory prayer as a treatment intervention on both psychological and physiological well-being of the patients. This investigation is limited in the sample utilised; it was very specific and consisted of individuals primarily from ethnic minorities of lower socio-economic status, which was not statistically controlled. Also the sample size was small, a larger sample size would provide greater adequate observed power.

Chibnall, Jeral, and Cervllo (2001) comment critically on the experiments of distant intercessory prayer by claiming that

> "These forms of investigation ignore important facets of construct validity, philosophy of science and theology, while focusing on issues like randomisation, and double-blinding." (p.2529).

These authors argue that close attention to the construct validity of cause-and-effect invalidates distant intercessory prayer as a scientific construct. Chibnall, Jeral, and Cervllo (2001) asserted that the studies investigating distant intercessory prayer, did not explicate exactly what prayer in their studies meant. In addition, the studies used groups of intercessors from various religious traditions praying in decidedly individual ways (i.e., Protestants, Catholics, and Jews). These criticisms direct questions to the efficacy of prayer, and Chibnall, Jeral, and Cervllo (2001) argue that prayer is a personal endeavour between the prayer and God and are answered only by

moral, theological, philosophical, or spiritual methods that go beyond mechanistic causality. Consequently, if these questions cannot be answered scientifically, then the construct cannot be studied through empirical research.

The second flaw that is typically associated with studies examining religion and health is that they do not utilise controls within their analysis. Levin and Schiller (1987) argue that without adequate methodological controls the 'religious factor' in health might be mistakenly dismissed as merely a proxy measure for socio-demographic status or health. It can be argued that those studies, which only use low-order correlations, such as age and sex typically, reduce the association between religion and health. Therefore, the opportunity for other psychosocial confounders, such as social support, and health behaviours are not legitimised. When studies have employed the use of higher-order variables, such as socio-demographic characteristics and health practices, the relationship is generally diminished to nonsignificane. Recently, research has examined these mediating variables and findings have been reported which suggest that these factors are known to play a significant role in the relationship between religion and health (e.g., Idler and Kasl, 1992; Kennedy, Kelman, Thomas, and Chen, 1996). Confounders such as behavioural and genetic differences and stratification variables such as age, sex, education, ethnicity, socio-economic status, and health status may have an important role in the association between religion and health. Failure to control for these factors can lead to a biased estimation of this association.

Throughout the past few decades the emphasis placed on describing associations between religion and health has encouraged researchers to examine the pathways that

may help explain the relationship between these two variables. When assessing the research it has been observed that low-order variables, such as age, sex, race, and socio-economic status play a major role in the mental and physical health of individuals. These socio-demographic characteristics generally explain the most variance in health. Researchers have commented on how religion is most prevalent amongst underprivileged groups, such as ethnic minorities (St. George and MacNamara, 1984), females (Argyle and Beithallahmi, 1978), and the aged (Willts and Crider, 1988). For instance, it has been reported that there is physical health differences between individuals of different races. Individuals' from black races generally suffer from a higher rate of cardiovascular diseases (Sarafino, 1998). In the UK, it has also been reported that higher than average mortality rates from strokes have been documented for men from the Caribbean, West/South Africa, and the Indian subcontinent (Drever and Whitehead, 1997).

Additionally, Singh, Croudace, Beck, and Harrison (1998) found that black Caribbean's were more than twice as likely to be compulsorily detained due to mental ill health compared to other ethnic minorities, even after adjustments were made for sex, age, social class, and type of diagnosis. One trend that has been consistently reported within the literature is that Jews suffer from higher prevalence of depression. There could be many rationalizations explaining the reason why Jews are over represented in research surrounding the association between religious affiliation and denomination with depression. As previously pointed out, it has been documented that those from Jewish traditions are more likely in comparison to those of other religious denominations to pursue help though psychoanalytic psychotherapy (e.g., Weintraub and Aronson, 1968). In addition, it has been acknowledged that Jews are more likely

to accept and may be more willing to admit to negative affects (e.g., Glicksman, 1991). Consequently, it is plausible that these factors could create the potential of response bias in depression research. Recognition that cross-cultural comparisons suggest that certain religious groups develop differing social expectations (Lenski, 1961), which may influence their attitudes towards mental illness (e.g., Suchman, 1969) and expression of negative emotions (Glicksman, 1991).

It has been observed that the majority of the researchers assessing the associations between religion and health have employed such samples. Not controlling for such variables can point to significant findings when none may exist. Consequently, undersampling populations can lead to random errors due to a small percentage of interest (Andersen, Mullner, and Cornelius, 1987).

Numerous pathways have been identified as being possible mechanisms by which religion affects mental health. One such mechanism is social support, since being religiously active usually means participating in religious services and this in turn may be a major avenue available for individuals to develop close social bonds. Having this support network can have beneficial effects by reducing psychological stressors. Social support usually explains 5%-10% of the relationship between religion and health (Idler, 1987). Another explanation offered on how religion affects health is the coherence hypothesis, which postulates that religion benefits health by providing a sense of coherence and meaning so the individuals understand their role in the universe, the purpose of life, and develop the courage to endure suffering (George, Larson, Koenig, and McCullough, 2000). This can help to explain how very private religious practices and experiences, as well as public religious participation,

can help to benefit mental health. It has been reported that 20%-30% of the relationship between religious involvement and health is explained by a sense of coherence (Idler, 1987). It has been hypothesised that physiological factors might be positively affected by religious factors, which might in turn affect health (Larson, Sawyers, and McCullough, 1998). For instance, positive emotions (e.g., forgiveness, hope, contentment, love) might benefit the individual through neural pathways that connect to the endocrine and immune systems. Positive emotions obstructs the adverse effects that negative emotions have on the immune system, hence reducing the arousal systems within the nervous system, increasing immune competence and stability.

The means by which religion improves physical health and prolongs survival is through a number of direct and indirect pathways. It is believed that the direct effects of religion on physical health are through promoting early disease detection and ensuring adequate treatment. It has been understood that this is achieved by religious teachings emphasising respect for one's physical body. Religious individuals may pay closer attention to their own bodies because according to the Christian teachings, their bodies are "temples of the Holy Spirit" (Koenig, 1997). Religious persons may also be more compliant and likely to follow medical treatment regimens more scrupulously (Naguib, Beiser, and Comstock, 1968). Since religiously active persons belong to broader social support systems they may be encouraged to seek treatment early for their ailments. Being more religiously active could mean that individuals could be discouraged from risky lifestyle behaviours such as excessive drinking, drug-taking, smoking, and several other activities that can and often does lead to adverse health effects. It has been reported that the amount of variance explained by health

behaviours is about 10% (George, Larson, Koenig, and McCullough, 2000). Indirectly, religion may affect the physical health of individuals in that religious activity offers social support. Social support can prove to be important and benefit health because it provides a sense of belonging (e.g., Cobb, 1976), which may give individuals a reason for living that transcends themselves, and in a variety of ways influence people to practice more preventative and therapeutically healthy behaviours (e.g., Berkman and Syme, 1979).

Although, the social support aspect of religious practice plays a part in improved physical health, it has been suggested that the positive effects that religion plays on mental health could also lead to indirect effects on physical health. It has been suggested that the link between religiousness, social support and mental health could explain not only the lower rates of mortality from suicide but also the adverse physiological effects that chronic stress and depression play on the body. For example, when individuals become depressed, they secrete cortical from the adrenaline glands, which interferes with immune system functioning; hence, disturbing the individual's natural defence mechanisms against cancer, infections, and other outside invaders. Psychological illnesses such as distress and stress have harmful physiological effects on the human system causing adverse conditions, such as high blood pressure, stomach ulcers, lower bowel or colon problems (Scheider and Bridges, 1995).

The relationship between religion and health has been found to vary depending on which other variables are involved and controlled (e.g., Lea, 1982; Peterson and Roy, 1985). For instance, Levin and Chatters (1998) provide several possible mediators for

the association between religiosity and well-being, including some or all of the following: marital status, healthy behaviours and activities, social support, optimism, hope, purpose and meaning in life, and internal locus of control. Reviews or meta-analyses suggest that it is mainly the social support, by which the public practice of religion provides that is responsible for the variable's relation with happiness (e.g., Argyle and Beit-Hallahmi, 1997). Subsequently, it has been argued that social support affects well-being by: helping people cope effectively with the adverse effects of stressful life-events (Krause, 1987a); by encouraging feelings of self-worth and personal control (Krause, 1987b); and by fostering feelings of hope and optimism (Nunn, 1996).

Levin and Markides (1986) reported that when zero-order correlations were performed, a significant relationship existed between religious attendance and subjective health for both older and younger women. However, there were significant associations between the control variables and religious attendance and subjective health. For instance, in the older generation, religious attendance was highly correlated in both sexes with subjective religiosity. Furthermore, within the sample of women, both social support and physical capacity correlated highly with religious attendance. When the middle generation was examined, religious attendance was found to be related to subjective religiosity in both sexes, social support in women, and inversely to income in men. In the younger generation, religious attendance was associated with subjective religiosity in both sexes and with measures of social class in men. When examining subjective health, it was observed that the variable was involved in a dozen significant relationships with control variables, across all generations. These zero-order findings suggest that the relationship between religious

attendance and subjective health could be confounded by the control variables across both sex and stage of life cycle. In order to clarify this issue, Levin and Markides (1986) performed multivariate analysis on the variables under investigation. From the regression analysis, it can be viewed that for the male sample across the three generations, there was no significant associations.

When physical capacity was controlled for, the association between religious attendance and subjective health was reduced to nonsignificance for the older and younger generation. Therefore, it could be suggested that religious attendance can be viewed as a proxy for functional health, in other terms correlations between health and religious attendance may in reality represent correlations between health and functional health (Levin and Vanderpool, 1987).

Mitchell and Weatherly (2000) collected data from two independent random samples of community-dwelling older adults. The samples included 2,178 persons (aged 60-104 years) from 33 counties in eastern North Carolina and 868 persons (aged 65-101 years) from 12 eastern North Carolina counties. The aim of the study (in part) was to assess the relationship between church attendance and mental health. In addition, items on demographics and self-rated physical health were utilised as controls. Findings from the studies show that the multivariate results are consistent across the two independent random samples of the same community-dwelling population, indicating high reliability. Multivariate results suggest that reduced health status, including functional ability, combines with limited participation in church attendance to result in poorer self-rated mental health and more symptoms of depression. In other words, older adults with diminished health status tend to have poorer mental health

and both are associated with reduced church attendance, consequently, contributing further support to the speculation that church attendance is an alternative measure for functional physical health.

Similarly, Schittker (2001) found that the association between church attendance and depression diminished when controls for functional health where introduced into the analyses. In Schittker's (2001) study, both the main and stress-buffering effects of religious involvement were considered. Schittker (2001) utilised data from the two waves of the Americans' Changing Lives panel survey on 2,836 respondents from a nationally representative sample; however, the American Changing Lives' survey over-represented African-Americans and people over the age of 60. Individuals responded to questions including; items on depressive symtomology, and a single-item measure on frequency attending religious services. Schittker (2001) also employed measures for self-esteem scale and mastery, a host of demographic variables (age, sex, race, education, family income, and martial status) and other controls (social support, functional health status, and formal social integration). In addition, Schittker (2001) included a selection of negative and traumatic life events in to the analyses to observe the effect these variables have on depression. Results show that there was a significant negative effect of religious attendance on depression with demographic controls. However, this association becomes insignificant when controls for functional health status and formal social integration are introduced into the analyses. In relation to the stress-buffering effects of religion, findings from this study reveal that religious involvement does not provide stress buffering to negative and traumatic life events. Therefore, regarding this study sample, it would appear that

service attendance is a proxy measure for functional health of those attending services, as argued by Levin (1996) and their greater social integration.

The third limitation that has been associated with researching the religion and health relationship is that there is inadequate measurement of the religion or health variable. In relation to religion, it has been demonstrated that the majority of research utilises single-item instrument to capture the individuals' religiosity. One of the most common ways to investigate the relationship between religious involvement and health has been to utilise single-item measures of attendance at religious services, memberships in religious organisations, or personal devotion. Additionally, short scales that combine two or more single-item measures of organisational religious involvement have been utilised. Although, such measurement tools are convenient in their employment especially for large-scale surveys, they are unlikely to contain little true score variance. Despite these measures having psychometric limitations, most studies have utilised this variable as a measure of religiousness.

Miller, Warner, Wickramaratne, and Weissman (1997) have reported that importance of religion did not correlated significantly to religious denomination or with church attendance. Using single-item behavioural measures, such as church attendance and personal devotion has been critiqued as being the 'ultimate trivialisation' of the religious variable (Lawrence, 2002). Over recent years, there has been progress towards utilising measures that have sound psychometric properties. If religious measures are not sensitive, reliable, and valid, then it is likely that there will not be a strong correlation with the criterion variable, because measurement error will add unexplained variability to the association and weakened the correlation. This could

explain the inconsistency in the findings between religion and health. This need for the utilisation of more reliable and valid measures can be validated by the evidence provided by research using psychometric measures. It has been demonstrated that significant correlations exist between individuals who report on an intrinsic orientation and mental health. Furthermore, over the recent years there has been the suggestion that spirituality, a dimension often researched in conjunction with religiosity, should be studies independently.

Historically, research fused spirituality with religion and has guided attention to religiosity and religious commitment and practices. Although, writers have pointed out that church attendance, religious affiliation, and so on, are not necessarily reflections of what spirituality is nor do they take into account the idea that spirituality can be expressed in a number of different ways, that have little to do with the rituals and practices of organised religion (Dyson, Cobb, and Forman, 1997). Therefore, it can be suggested that a percentage of the population is being omitted from research, since some individuals view themselves as spiritual but not religious (e.g., Legere, 1984; Roof, 1993). However, it must be realised that there are individuals from religious communities who suggest that a strict dichotomy between these two terms does not reflect there lived experiences (e.g., Benzein, Norberg, and Saveman, 1998). In other terms, their sense of religiosity and spirituality are intimately interwoven, where their spirituality was reflected through their religious practices such as church attendance and prayer.

In separating the two terms, Nosek (1995, pp.34-35) defined "spirituality" as being "related to perceptions of the transcendent" and "religiosity" as being "related to the

group behaviours and social institutions that arise around these perceptions". Defining spirituality is a difficult and complex task; in large part because researchers lack agreement about it, although, many writers do agreed and regard transcendence as an essential feature of spirituality (Dawson, 1997; Fry, 1998; Hickson and Phelps, 1997; Ley and Coreless, 1998). In reviewing the literature surrounding the area of spirituality; Tanyi (2002) claims that the concept of spirituality appears to share the same common attributes of belief and faith, connectedness, inner strength and peace. In her article she claims that these attributes are not necessarily features that have anything to do with believing in God, they could entail believing in significant relationships, goals, values, for instance, it has bee argued that the idea of transcendence is only one aspect of what spirituality actually is. Spirituality has been seen as having two interconnected dimensions- the vertical dimension of the personal relationship with the transcendent and the horizontal dimension- relationships with oneself, other people and the natural world. Consequently, from these attributes it can be inferred that the concept of spirituality does entail some form of belief system.

Until recently, there has been little interest in distinguishing between religiousness and spirituality. However, since the distinction has been created, spirituality has began to acquire meanings separate from religion, a growing body of empirical research has found that spirituality is associated with enhanced mental and physical well-being (e.g., Burton, 1998; Koenig, 1995; Fehring, Miller, and Shaw, 1997; Matthews, McCullough, Larson, Koenig, Sawyers, and Milano, 1998). It has been suggested that this enhanced mental and physical well-being works through spirituality by giving meaning and purpose within an individual's life (Coyle, 2001). This is believed to benefit health through a number of pathways from engendering a positive state of

mind (e.g., Matthews, McCullough, Larson, Koenig, Sawyers, and Milano, 1998), to helping individual's cope, through believing that they are not completely in control of their own destiny, that is they have a shared sense of responsibility (Abrum, 2000). It has also been suggested that the transcendent approach to spirituality might also help to encounter uncertainty. Studies of chronic illnesses show the uncertainty in diagnosis, symptoms, and prognoses are major problems for many patients (Weiner, 1975). This uncertainty may produce feelings such as, fear, discomfort, suffering, and pain. Therefore, individuals who have faith or trust in "God" or a higher power may provide certainty in that the certainty is reworked to become a trust that their illness has meaning and purpose (Coyle, 2001). Therefore, incorporating the concept of spirituality into research is beneficial in helping to understand if having a belief without carrying out any active religious undertakings helps improve mental and/or physical health over and above the religiosity measures.

Just as measures of religiosity must be sensitive, reliable, accurate, and valid, measures that examine health outcomes must likewise have these qualities. Empirical research that assesses the relationship between religion and physical health, generally focus on a particular aspect of physical health. This is usually an objective account of the individuals health function, that is if the individual suffers from the illness or not. These single-item measures typically suffer from the same psychometric limitations as single-item measures of religiosity; the measures do not typically capture the full range of variability in health. Recently, researchers have begun to measure health through measures that have known sound psychometric properties.

Meisenhelder and Chandler (2000a) conducted a study with a national sample of 1,014 Presbyterian Church lay leaders or Ruling Elders in Louisville, Kentucky. The researchers hypothesised that a higher frequency of prayer would be associated with better health. The survey included questions on the frequency of prayer, measured on a 6-point Likert scale. Eight forms of functional health were assessed through the Medical Outcomes Study Short Form-36 Health Survey (Ware and Sherbourne, 1992). The Short Form-36 Health Survey measures 8 subscales of health: physical functioning, the ability to carry out role activities given physical health, bodily pain, general health, vitality, social functioning, the ability to carry out role activities given emotional health, and mental health. Results from the survey show that the majority of the respondents reported frequently praying, with 44% of the respondents indicating that they pray at least two or more times a week. Due to the sample investigated, this finding was expected. In addition, the majority of the respondents indicated that they were in good health in relation to the subscales measured by the SF-36. Upon examination of the relationship between prayer and the physical health subscales; frequent prayer was associated significantly with poorer physical functioning on two of the subscales.

Meisenhelder and Chandler (2000b) performed a similar study examining frequency of prayer and health outcomes in church members. The study consisted of 1,025 members of the Presbyterian Church. The sample was randomly selected from the national population. The respondents were surveyed by male on their frequency of prayer and their health status, as measured by the SF-36 health survey. Results from the study showed that people who prayed more frequently scored lower on three of the SF-36 subscales: physical functioning, role functioning-physical, and bodily pain.

In addition, the research can be further criticised for the lack of diversity in studying individuals from denominations that contain heterogeneity. Different religious affiliations are not homogeneous, e.g., Jews can be expanded into Reform, Conservative, and Orthodox classifications, each with their different behaviours and belief systems, an important distinction if one wishes to explore the association. For instance, speculations that those from the more conservative branches of Judaism, could possibly offer an explanation into the amplified rates of Jewish samples being associated with elevated rates of depression. The reasoning behind this is that conservative Jewish individuals tend to avoid the use of alcohol, hence having reduced rates of alcohol abuse and dependence. Consequently, the hypothesis that Jewish men who have a disposition towards psychopathology are at significantly higher risk for experiencing depression because of alcohol avoidance. Subsequently, the elevated prevalence of depression could be a trade-off for their reduced rates of alcohol abuse or dependence (McCullough and Larson, 1999).

Unfortunately, the majority of the studies assessing the link between religious denomination and depression do not provide any details on the branches of Judaism, hence it is not possible to compare the different traditions of Jewish samples to test this speculation. Not splitting the Jewish denominations into their specific groups is a criticism that can be directed to the majority of the research examining the relationship between religious denomination and depression. However, researchers assessing Protestantism typically provide this information in their studies. As a result, it is possible to determine if the respondents practice strict religious devotions or if they belonged to the more liberal affiliations.

Suggesting that those from strict denominations possibly suffer from higher rates of depression can be assessed by examining the literature on those from the Fundamentalist doctrines, such as Pentecostals. The understanding that individuals from strict denominations suffer increased rates of depression is possibly because they do not succumb to mediums such as alcohol use or dependence as a means to functioning "normally". Subsequently, several studies have provided evidence in favour of this hypothesis (e.g., MacDonald and Luckett, 1983; Nelsen and Potvin, 1980). These researchers provided evidence in favour of the hypothesis that individuals from stricter denominations, particularly those from non-mainline Protestant groups, are linked to higher rates of psychiatric disorders.

The literature would suggest that particular denominations have an increased risk of suffering with depression than other denominations. It can also be viewed that particular affiliations within each denomination are at an elevated risk from depressive symptoms. Popular explanations have speculated that those from stricter religious Orthodoxies experience symptoms of depression for many reasons. Similarly, people with no affiliation appear to be at greater risk from suffering depressive symptoms than those affiliated with a religion (e.g., Brown and Gary, 1987; Koenig, Cohen, Blazer, Pieper, Meador, Shelp, Goli, and DiPasquale, 1992).

Furthermore, the research can be criticised for not taking into account the social troubles that may be inherent within some religious groups. For instance, assessing the literature on religious affiliation consistently provides evidence that particular groups are indeed at a considerable higher risk than other groups in the population.

Explanations can be offered, which explain these findings as being the source of selection bias or response bias, in which certain denominations develop differing social expectations. For example, those from Jewish traditions are more likely to express negative emotions (Glicksman, 1991), whereas, several studies have reported a tendency among American Irish Catholics to deny feelings (McGoldrick and Pearce, 1981), to be stoic (Zborowski, 1952), and to be less likely to ask for help (Zola, 1966). The greater emotionality that is present as a group trait in Jews (Meador, Koenig, Hughes, Blazer, Turnbull, and George, 1992), could lead to a culturally related response-bias or underreporting of depressive symptoms among Catholic respondents and/or overreporting among Jewish respondents. Consequently, this characteristic may account for some of the differences in the prevalence and course of depression.

It is plausible to offer several alternative justifications for these findings. Certainly, it is feasible that from a biomedical viewpoint, genetic endowments may be the cause of certain religious groupings to be predisposed to mental disorders. Koenig, McCullough and Larson (2001) document that if religious persons selectively mate with others from the same religious group can lead to the increased risk of genetically transmitted psychiatric disorders (i.e., depression in Jews). From a psychosocial viewpoint, life events could have lead to certain psychopathology disorders. For instance, the Holocaust in World War II could lead to elevated rates of depression in Jews (e.g., Yehuda, Kahana, Schmeidler, Southwick, Wilson, and Giller, 1995). This is particularly possible since the majority of the studies involve elderly individuals that could have had differential exposure to life-changing historical events during their lifetime. Leading from this speculation, some researchers have suggested that

religious marginalization – being religiously different from one's cultural surround – could be the cause of elevated risk of depression in Jewish groups (e.g., Rosenberg, 1962). This religious marginalization could create social conditions that foster depression (McCullough and Larson, 1999). For instance, Williams and Hunt (1997) tested this proposition and found that Muslims living in Scotland experience nearly four times the likelihood of depressive symptoms than non-Muslims living in Scotland. This finding remained significant albeit weaker, after controlling for social and psychological conditions (e.g., greater stress, lower standard of living, and lack of social support). Consequently, it is not possible to validate these speculations since studies examining religious denomination and depression to not take into account these factors.

It can be seen from the study that the validation that Jewish individuals have a greater occurrence of depressive symptomology offered by the researchers is partly supported. It can be observed from the results that Jewish religious preference was associated with higher rates of depression and this effect remained even when covariates knowing to affect depression were controlled. However, the researchers did not control for a host of psychosocial variables that could potentially be related to Jewish depression. For instance, the researchers did not assess the nationality or familial or heritable factors of the Jewish respondents as a covariate; and as stated by the researchers in their discussion, a form of depression experienced by Eastern European Jews, *melancholia Judacica* (Rahav, Goodman, Pooper, and Lin, 1986), is thought to contribute to depression. The researchers did not examine the potential effect of life stressors (i.e., European Holocaust), and as previously reported life stressors are known to be strongly associated with depression (Ellison, 1991). In

addition, it has been reported that life stressors, such as the European Holocaust might potentially play a role in the emergence of depressive symptoms (Brown and Tirril, 1978)

In offering explanations for the observed differences in Christian, Koenig, George, Meador, Blazer, and Dyck (1994) speculated that the association between Pentecostalism and depression could be that adverse psychological consequences happen when individuals are repressed by fundamentalist doctrination. Conversely, it maybe that Pentecostalism attracts members who are more likely to be depressed, resulting in selection bias operating. Consequently, persons with emotional problems self-select themselves into certain religious denominations or are more easily evangelised and converted by these groups. Equally, a third variable may be responsible for the apparent association, for example, Pentecostals like Jews, might have higher levels of emotional expression that may lead to their differential rates in research. Therefore, response bias would be responsible for the significance of the results rather than what was hypothesised by the researchers.

Research has shown that those individuals who suffer from emotional or physical disorders often use religious beliefs and practices as a coping mechanism (e.g., Kroll and Sheehan, 1989; Meador, Koenig, Turnbull, and George, 1992). Therefore, it can be suggested that religious groups that promote and encourage this aspect of religion may attract into their denominations those suffering with mental ill health. Resulting in individuals who our offered the peer support and hope that they search out for. Thus a supposition can be devised that suggests that some Pentecostal religious groups may actually function much like community mental health centres. However,

on the other hand, it could simply be that the strict, repressive, inflexible religious doctrines may in actual fact be attributable to the inducement or exacerbation of depression.

Consequently, it has been documented that in general, conservative denominations foster optimism (e.g., Sethi and Seligman, 1993) and it is only hyperconservatism, as exists in fundamentalist or sectarian denominations, are known to be positively related to depression (Koenig, George, Meador, Blazer, and Dyck, 1994; MacDonald and Luckett, 1983).

In concluding, it has been demonstrated within this thesis that the relationship between religion and health, both mental and physical, for the most part has not been adequately researched to infer any definite conclusions on the association. However, by utilising an objective and systematic review process it was possible to separate which studies performed adequate methodology to be evaluated; hence, provide some direction towards a potential conclusion. Furthermore, it has also been demonstrated that the relationship is that is complicated and a variety of confounding and mediating variables moderate the relationship. Factors surrounding the population under investigation must be considered and these accounted for in the analysis, so any significant association that remains can be accounted for by the religious variable. However, claims that the association is positive are grossly exaggerated and overly optimistic. Likewise, statements that the association is of no scientific value are also unwarranted and premature. What appears to be a more appropriate conclusion is that more high-quality methodological studies are required.

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