ASSOCIATION BETWEEN SPIRITUALITY, RELIGIOSITY & RELIGIOUS COPING WITH ORAL MEDICATION ADHERENCE AMONGST SCHIZOPHRENIA PATIENTS IN A MALAYSIAN COMMUNITY SETTING

BY

DR. IAN LLOYD ANTHONY

MASTERS OF PSYCHOLOGICAL MEDICINE

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Dr. Ian Lloyd Anthony

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CERTIFICATION

This is to certify that the candidate, Dr. Ian Lloyd Anthony carried out this research project and to the best of our knowledge, this dissertation is entirely his work.

Dr. Cheah Yee Chuang
Consultant Community Psychiatrist &
Deputy Director
Hospital Bahagia Ulu Kinta

Assoc. Prof. Dr. Stephen Jambunathan
Consultant Psychiatrist & Lecturer
Department of Psychological Medicine
Faculty of Medicine
University Malaya

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ABBREVIATIONS

ACT	Assertive Community Treatment
APA	American Psychiatric Association
BARS	Brief Adherence Rating Scale
DALY	Disability adjusted life years
DUREL	DUKE University Religion Index
EWB	Existential well-being
HBUK	Hospital Bahagia Ulu Kinta
IR	Intrinsic religiosity
MINI	Mini International Neuropsychiatric Interview
NCOPE	Negative coping
NMHR	National Mental Health Register
NORA	Non-organisational religious activity
ORA	Organisational religious activity
PANSS	Positive and Negative Symptom Scale
PCOPE	Positive coping
RCOPE	Religious coping
RWB	Religious well-being
SMI	Serious mental illness
SPSS	Statistical Package for Social Sciences
SUMD	Scale to assess Unawareness of Mental Disorder
SWB	Spiritual well-being
WHO	World Health Organisation
WHOQOL	World Health Organisation Quality of Life
YLD	Years lost due to disability
YLL	Years of life lost (due to premature mortality)

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ABSTRAK

PENENTUAN TAHAP KEROHANIAN DAN PENGHAYATAN AGAMA SERTA KESANNYA TERHADAP KETAATAN PEMAKANAN UBATAN ANTIPSIKOTIK DIKALANGAN PESAKIT SKIZOFRENIA YANG MENERIMA RAWATAN KOMUNITI DI MALAYSIA.

Pengenalan: Skizofrenia merupakan satu penyakit mental yang kronik. Banyak kajian yang telah membuktikan keberkesanan praktis keagamaan dan kerohanian yang positif dalam menangani masalah kesihatan mental. Dikalangan pesakit skizofrenia, penghayatan agama dan kerohanian memainkan peranan penting dalam kehidupan seharian serta menolong pesakit memahami penyakit mereka dengan lebih baik lagi. Agama dan kerohanian juga memainkan peranan penting dalam meningkatkan ketaatan pemakanan ubat antipsikotik.

Objektif: Kajian ini dijalankan untuk menentukan tahap penghayatan keagamaan dan kerohanian serta faktor-faktor klinikal dan demografi pesakit skizofrenia dan seterusnya menentukan pengaruhnya terhadap ketaatan pemakanan ubat antipsikotik.

Kaedah: Penyelidikan ini merupakan kajian keratan rentas yang melibatkan 153 orang pesakit skizofrenia yang menerima rawatan komuniti di rumah. Diagnosis disahkan menggunakan M.I.N.I. PANSS digunakan untuk menyaring pesakit yang stabil dan kriteria Yangarber-Hicks digunakan untuk menyaring pesakit yang mempunyai delusi keagamaan. DUREL digunakan untuk mengukur tahap keagamaan, Spiritual Well-Being Scale untuk mengukur tahap kerohanian dan Brief RCOPE digunakan untuk menilai keberkesanan agama dalam menangani penyakit. Ketaatan pemakanan ubat dinilai menggunakan BARS dan tahap pemahaman penyakit dinilai menggunakan SUMD.

Keputusan: Prevalens penghayatan keagamaan dan kerohanian adalah 52.9% dan 50.8% masing-masing. Penganut agama Islam (OR=1.912, p=0.048) dan agama Hindu (OR=3.720, p=0.039) didapati lebih beriman daripada penganut agama Buddha. Pesakit beragama Islam menggunakan agama secara positif untuk menangani kesan penyakit (OR=1.996, p=0.042) manakala pesakit beragama Buddha kurang menggunakan agama untuk menangani kesan penyakit (OR=0.404, p=0.014). Pesakit beragama Hindu didapati lebih cenderung kepada kerohanian (OR=7.840, p=0.048). Keagamaan dan kerohanian didapati berhubungkait rapat dengan ketaatan pemakanan ubatan psikotropik dan tahap pemahaman penyakit (p<0.001).

Kesimpulan: Penghayatan agama dan kerohanian didapati penting dalam kehidupan pesakit skizofrenia. Pesakit yang menghayati agama dan kerohanian didapati mempunyai tahap pemakanan ubatan antipsikotik dan pemahaman terhadap penyakit yang baik. Kajian lanjut perlu dilakukan untuk memastikan kestabilan agama dan kerohanian dalam menangani kesan penyakit skizofrenia.

ABSTRACT

ASSOCIATION BETWEEN SPIRITUALITY, RELIGIOSITY & RELIGIOUS COPING WITH ORAL MEDICATION ADHERENCE AMONGST SCHIZOPHRENIA PATIENTS IN A MALAYSIAN COMMUNITY SETTING

Introduction: Schizophrenia is a chronic debilitating mental disorder. Recent research has shown that schizophrenic patients tend to turn to religion and spirituality to help them cope with their illness. Religiosity and spirituality also appears to improve antipsychotic medication adherence, a problem that is inherent in schizophrenia.

Objective: The aim of this study is to examine the prevalence of religiosity and spirituality amongst schizophrenic patients, the associated socio-demographic and clinical factors as well as to determine its relationship with medication adherence.

Methodology: This is a cross-sectional study involving 153 schizophrenic patients who are enrolled in the Assertive Community Treatment programme of Hospital Bahagia Ulu Kinta. The diagnosis of schizophrenia was confirmed using M.I.N.I. The PANSS was used to screen for stable patients and the Yangarber-Hicks criteria was used to exclude religious delusions. Patients who fulfilled the inclusion criteria were assessed for religious commitment, spirituality and religious coping using the DUREL, Spiritual Well-Being Scale and Brief RCOPE respectively. Medication adherence and insight were assessed using the BARS and SUMD.

Results: The prevalence of religiosity, spirituality and positive religious coping were 52.9%, 50.8% and 50.0% respectively. Muslim (OR=1.912, p=0.048) and Hindu (OR=3.720, p=0.039) patients were found to be more religious than the Buddhists. Muslim patients also had positive religious coping (OR=1.996, p=0.042) while Buddhist patients had lower odds of positive coping (OR=0.404, p=0.014). Hindu patients were more spiritual than the Muslims and Buddhists (OR 7.840, p=0.048). Employment was found to be significantly associated with religiosity and religious coping. Religiosity, spirituality and religious coping were all significantly correlated with medication adherence and insight (p<0.001).

Conclusion: Religion and spirituality were found to be central in the lives of schizophrenic patients and the majority of them used it to cope positively with their illness. Those who were religious, spiritual and practised positive religious coping had better insight and were more adherent to their medication. Further studies should be done to determine the stability of religion and spirituality as a coping mechanism and its long term influence on the sustenance of medication adherence amongst schizophrenic patients.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

1.1 EPIDEMIOLOGY OF SCHIZOPHRENIA

Schizophrenia is a serious form of mental illness that is chronic and debilitating. It is a global phenomenon wherein the Global Burden of Disease listed schizophrenia amongst the top ten contributors to the burden of health and disability (Murray, 1997). The World Health Organization (WHO) reported a total of 26.3 million patients suffered from schizophrenia worldwide in 2004 with 6.2 million residing in South East Asia (WHO, 2004). The prevalence is almost similar in most countries ranging from 0.5-1.5% with a 1.0% lifetime morbidity risk (APA, 1994; Jablensky 1997). A systematic review found the median incidence rate of schizophrenia to be at 15.2 per 100,000 with a range of 7.7 to 43 per 100,000, higher in males, urban and migrant population (McGrath et al, 2004). The median point prevalence is 4.6 per 1000, period prevalence of 3.3 per 1000 and a lifetime prevalence of 4 per 1000 (Saha, 2005).

In 2003, Malaysia formed the National Mental Health Registry (NMHR) for Schizophrenia to capture local data to assist in the planning and management of resources

for this illness. From initiation until 2005, there were 7351 registered cases. The median incidence was 15.2 per 100,000 (Salina, 2005).

Schizophrenia results in impairments in multiple domains of functioning. Self-care, learning, living skills, vocation and interpersonal relationships are all affected to varying degrees and this further compounds the burden to both the patients and their respective caregivers. The burden of illness is demonstrated via disability adjusted life years (DALY) which is calculated from years of life lost due to premature mortality (YLL) and years lost due to disability (YLD) (WHO, 2009). The WHO ranked schizophrenia as the ninth leading cause of disability in 1990. In 1997, schizophrenia was the twenty-sixth cause of worldwide DALY contributing a massive 12.8% (Lopez et al, 1997). In the productive age group of 15-44 years, schizophrenia was the eighth leading cause of DALY worldwide (Rossler et al, 2005).

Locally, it has been reported that schizophrenia together with other mental disorders contributed to 21% of the burden in the assessment of years lived with disability (YLD) in 2004. With the commonest age of presentation being in the productive age group (Salina et al, 2008), it is not difficult to imagine the grave impact this can have on society.

1.2 SYMPTOMATOLOGY OF SCHIZOPHRENIA

The symptoms of schizophrenia are wide-ranging involving multiple psychological processes. These include disturbances of perception, abnormal ideation, impaired reality testing and thought processes, impairments in attention, concentration, motivation and judgment as well as disorganised or catatonic behaviour.

In the prodromal phase, patients present with overvalued ideas, ideas of reference and misperceptions and there is already an apparent decline in cognitive, social and vocational functioning during this period (Ang & Tan, 2004). The onset of psychotic symptoms characterise the first episode of schizophrenia with positive symptoms such as delusions and hallucinations being the most common. The deterioration in the level of functioning is most apparent during the first three years of illness (McGlashan & Fenton, 1993). Following the initial phase of deterioration, schizophrenic patients have a chronic and plateau phase.

The chronic phase is highly heterogeneous and may range from complete recovery to persistent disabling symptoms. This phase is epitomised by negative symptoms which include alogia, affective flattening and avolition. 10% of patients in the chronic phase endure unremitting psychotic symptoms throughout the course of illness (Wiersma et al, 1998).

Of particular relevance to this study is the symptom of religious delusions. Religious delusions are defined as delusions with religious content that are socially unacceptable and

not shared by other religious people. True religious beliefs may be differentiated from religious delusions on the basis of three criteria (Sims, 1995):

1. The patients observed behaviour and self-description of the experience is recognised as a form of delusion.
2. Other symptoms of mental illness are present such as hallucinations, thought disorder and mood disturbances.
3. The behaviour, lifestyle and direction of personal goals of the individual after the event or after the religious experience are consistent with the history of a psychiatric disorder rather than with a fulfilling life experience.

There are three types of religious delusions: persecutory (involving the Devil), grandiose (involving messianic beliefs) and belittlement (beliefs with regard to having committed unforgivable sins) (Dein, 2004). The prevalence of delusions with religious content varies between cultures. Studies on schizophrenic inpatients found a rate of 21% of religious delusions in Germany compared to 7% in Japan (Tateyama, 1993) and 21% in Austria versus 6% in Pakistan (Stompe, 1999). Interestingly, patients of the same race and religion but who lived in separate geographical locations with distinct cultures also differed in their propensity for religious delusions. This was typified by a study in Malaysia which found that the Kelantan Malays had a higher prevalence of religious delusions than the Penang Malays (Azhar et al, 1995).

Delusions with religious content may be of concern to psychiatrists because these symptoms may lead to violent behaviour. Perpetrators of homicides were found to have religious delusions (Kraya, 1997). Despite religious practices being found to be associated with higher rates of religious delusions (Getz, 2001), religiosity is not necessary for the development of delusions with religious content (Siddle, 2002).

1.3 RELIGION, SPIRITUALITY AND RELIGIOUS COPING IN SCHIZOPHRENIA

The interaction between religion and psychiatry dates back to ancient civilisations and may be as old as the human race. Care for the mentally ill then was provided by religious organisations. Prior to this, the mentally ill were placed in cells and dungeons with little or no reprieve. In Jerusalem in 490 AD, religious orders had set up one of the first hospitals for the mentally ill and later in the sixth century, monasteries operated by the church began caring for the mentally ill. These asylums gave better, humane care to the insane than did hospitals supported by the State. Priests began taking on a dual role of priest-physician whereby the mentally ill were thought to be possessed by evil spirits and demons. This dogma would later be expunged as illness of the mind with the development of psychiatry as a distinct branch of medicine. Having said this, as the psychiatrist sets out to diagnose, treat, rehabilitate the mentally ill and provide support for family members and the community at large, the priest can also do likewise by mediating for the sick, administering the sacrament and instilling personal faith (Bhugra, 1996).

Although religion and spirituality have separate definitions, in reality, both may be inseparable and frequently overlap. People tend to consider spirituality as more personal, devoid of rules and regulations and free from the obligations associated with religion. Nevertheless, the practice of religion and spirituality affects mental health. Religion is a protective factor for mental health and religious involvement is significantly correlated with satisfaction with life and well-being, meaning and life purpose, improvement in self-esteem, less loneliness and better social support, lower rates of depression, suicide and

anxiety, less psychotic symptoms, marital harmony and less delinquent and criminal activity (Koenig et al, 2001). A meta-analysis scrutinising religious involvement and health found that religious people were physically healthier, lead healthy lifestyles and utilised lesser healthcare services compared to non-religious individuals (Hummer, 1999).

It would be foolish to assume that religion can only have a positive effect on mental health. Negative effects of religion on mental health have been identified as follows (Koenig et al, 2001):

1. Over-involvement in religious practices and concrete interpretation of scripture with the consequent neglect of responsibilities have an adverse effect on the type and number of stressful experiences.
2. Rigid thinking, inappropriate guilt, being over judgmental and concealment of pathological maladaptive thoughts and behaviour can have a negative effect on cognitive thought processes.
3. Inappropriate and over-reliance on religious counsel and rituals with the resultant failure to seek medical consultation may lead to impaired coping behaviour.

This negative association between religion and mental health is observed in those who do not conform to religious standards thereby inculcating shame, guilt and fear as well as promoting low self-esteem and social isolation. Nevertheless, it has been shown that the positive effects offset the negative effects as those who benefit from having attained good

mental health and social functioning appear to have religious beliefs and practices that are well-grounded within established religious traditions (Koenig & Larson, 2001).

Research on religion in patients with schizophrenia has been centred on religious delusions. Lately however, studies have begun to show that religion and spirituality can be a significant coping mechanism amongst those suffering from this chronic debilitating illness. Religious and spiritual beliefs are a source of comfort and gives meaning and a sense of purpose in the lives of patients with schizophrenia. Both are readily available at no cost and at any given time and it is therefore not surprising that schizophrenic patients have begun to turn to religion to help them cope with their illness.

Positive religious coping such as praying, meditating and appraising of negative life situations indicates a strong relationship with God, a worthy purpose to life and a sense of togetherness with that particular religious affiliation. Negative religious coping indicates a sense of struggle and a tumultuous relationship with God and feelings of separation from a religious community (Carver et al,1989; Tarakeshwar et al, 2006).

Recent published studies on religious beliefs and practices amongst schizophrenic outpatients have found that 45% of patients felt that religion and spirituality were salient in their lives and 60% used religion to cope with their illness. Psychotic symptoms were fewer in 54% of patients and religion was also found to be an effective buffer against suicidal behaviour with a reduction in suicidal attempts in 33% of patients (Mohr et al, 2006; 2007). These studies have found a high prevalence of religiosity and spirituality

amongst schizophrenic patients and have thus given an impetus for further research into their usefulness as a coping strategy.

1.4 THE DILEMMA OF MEDICATION ADHERENCE IN SCHIZOPHRENIA

The issue of antipsychotic medication adherence has plagued psychiatrists for decades. Despite the advent of atypical antipsychotics with proven efficacy and less side effects, medication adherence continues to be a niggling problem in the quest to prevent relapse in patients with schizophrenia. Multiple studies have shown that antipsychotic discontinuation increases the risk of relapse in schizophrenic patients (Gilbert et al, 1995; Leucht, 2003) and in a systematic review of 66 studies, the mean relapse rate for patients on maintenance therapy was 16% as compared to 53% who discontinued medication (Gilbert et al, 1995). Relapse is likely to occur within the first three months of defaulting treatment. Refusal to take medications is the primary factor contributing to relapse with an average rate of non-compliance of 50% (Lacro et al, 2002). Antipsychotic discontinuation is not only associated with an increased risk of relapse but is also a predictor of poor social adjustment, worsening disability and treatment resistance (Gilbert et al, 1995).

Adherence to medication is the degree to which the patient's medication intake matches the prescription of the healthcare provider. Adherence lies on a spectrum from medication refusal to non-adherent to partially adherent to fully adherent (Velligan et al, 2006). Those who decline to take medication are 'medication refusers', thereby distinguishing them from 'medication acceptors'. Fully adherent patients are those who

take the prescribed medication at least 80% of the time. Those who take medication at least 50% to 79% of the time are partially adherent. The majority of schizophrenic patients are partially adherent with their medication (Velligan et al, 2009).

Adherence invariably is a multi-determined phenomenon and as such, many factors have been identified as predictors of medication non-adherence. Some of the more telling factors include duration and complexity of treatment, concerns about medication adverse effects, the stigma associated with taking antipsychotics, concerns about cost and dependency, unsatisfactory doctor-patient relationship, illness severity, cognitive impairment and insight (Mitchel & Selmes, 2007).

Amongst all these predictors of non-adherence, insight remains a major barrier to medication adherence. Poor insight is common in schizophrenia with 50% to 80% of patients refusing to accept that they are ill (Amador et al, 1991; 1994). The link between insight and treatment adherence is clear with a majority of studies indicating that higher levels of insight predict better adherence (Amador et al, 1991). The awareness of mental illness and the advantages of treatment were identified as key factors predicting the likelihood of patients complying with prescribed medications (Smith et al, 1997). One may argue that insight and adherence fluctuates with mental state and therefore illness awareness and medication adherence are related only when measured simultaneously (Cuffel et al, 1996).

1.5 THE ROLE OF RELIGION AND SPIRITUALITY IN IMPROVING MEDICATION ADHERENCE

Other chronic illnesses such as rheumatoid arthritis and bronchial asthma also have patients who are partially or poorly adherent to treatment (Kyngas, 1999; Viller, 1999) and therefore the problem with adherence is not exclusive to schizophrenia alone. To address this problem, many strategies have been proposed and adopted such as psychoeducation, family intervention, assertive community treatment and pharmacological interventions such as simplification of medication regime, switching to atypical antipsychotics and the usage of depot antipsychotics. These are not stand-alone interventions and in practice, are frequently integrated. A potentially important resource that can be amalgamated into the management of schizophrenic patients is the role of spirituality and religion.

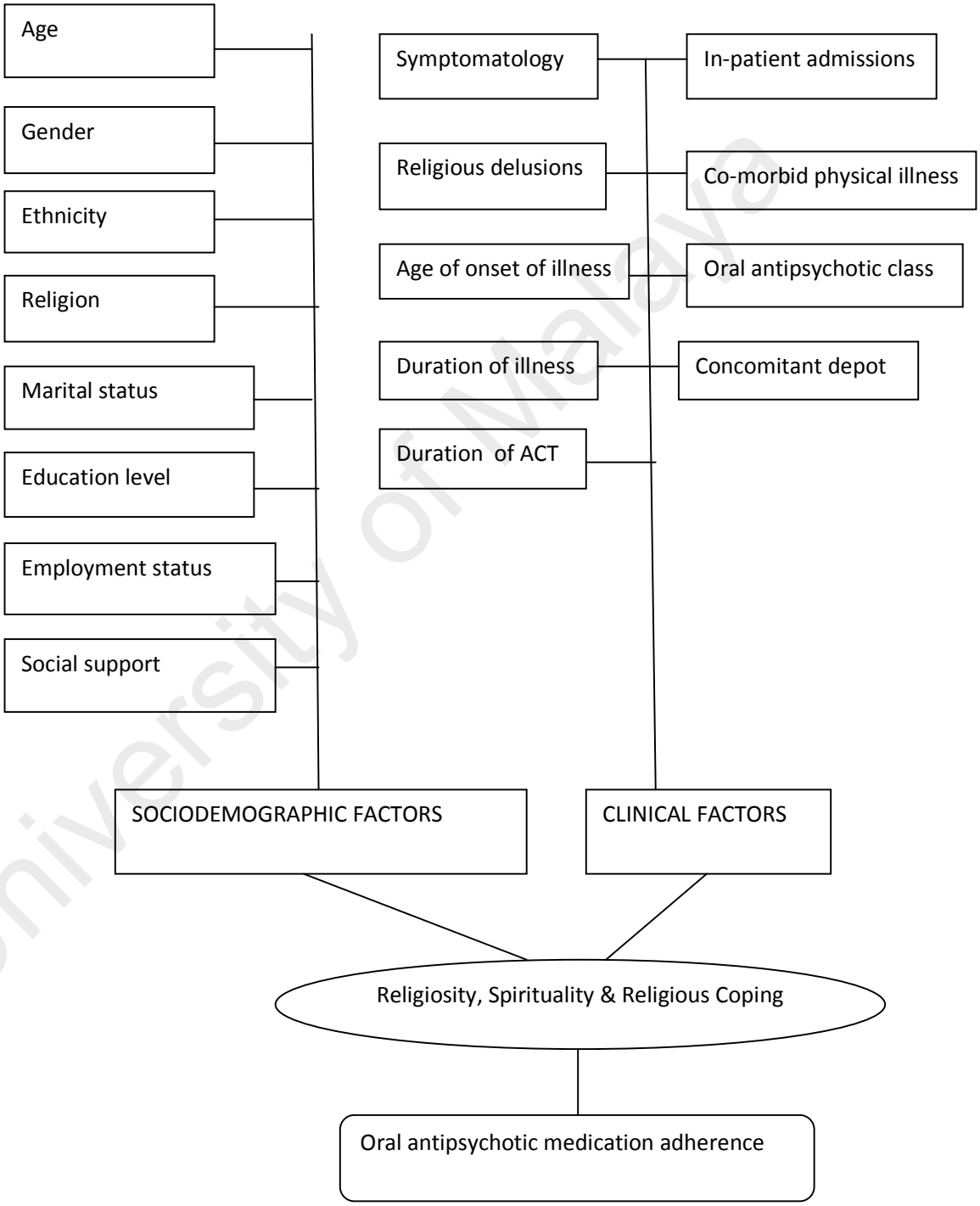
People often turn to religion in times of stress and adversity. Religion and spirituality have withstood the changes of time which could only mean that there must be something intriguingly special since it exerts a positive influence in the lives of many. Studies have shown that religion and spirituality are essential in coping with illness by offering an alternate source of support. One of the general measures suggested to improve adherence is to encourage participation in activities that can negate psychosis by increasing self-esteem and gratification (Fenton, 1997). Participation in religious activities may be able to do just this.

A positive association between religiosity and spirituality with medication adherence has been shown in a few studies where religious patients were found to be more adherent to antipsychotic medication treatment (Huguelet et al, 1997; Mohr et al,

2006). Conversely, those who had good medication adherence were religiously affiliated and were actively involved in religious practices (Borras et al, 2007). The consequences of medication non-adherence can be catastrophic. With each relapse, the risk of treatment resistance increases and the hopes of attaining recovery and regaining function become that much more difficult to achieve. Needless to say, the potential for aggressive behaviour, homicide and suicidal attempts amongst schizophrenic patients are all linked to non-adherence. Besides the clinical consequences, the economic consequences can be costly as relapses will result in loss of productivity and manpower as well as warrant repeated admissions to hospital thus further putting a strain on the budget of mental health services in many developing countries.

In a country like Malaysia where religion is central in the lives of many, it is therefore worthy that this hypothesis be tested. Religion and spirituality may ultimately be the missing link in the chain of interventions necessary to ensure good medication adherence and subsequently in preventing relapse and increasing the quality of life of patients with schizophrenia. The need to incorporate religion and spirituality in the assessment and treatment of mentally ill patients could enable psychiatrists to better understand, engage and guide their patients on the path to recovery.

1.6 CONCEPTUAL FRAMEWORK



CHAPTER 2

RATIONALE AND OBJECTIVES

2.1 RATIONALE OF STUDY

Understanding the role of religion and spirituality in patients with schizophrenia is pertinent in enhancing antipsychotic medication adherence as well as promoting better coping and improving insight.

2.2 GENERAL OBJECTIVES

The aim of this study is to determine the association between spirituality, religiosity and religious coping with oral antipsychotic medication adherence amongst schizophrenic patients receiving assertive community treatment.

2.3 SPECIFIC OBJECTIVES

1. To determine the prevalence of religiosity, spirituality and religious coping amongst schizophrenic patients receiving ACT and to determine the degree of medication adherence amongst these patients.
2. To determine the association between spirituality, religiousness and religious coping with oral antipsychotic medication adherence and insight.
3. To ascertain the possible socio-demographic factors (age, gender, marital status, race, religion, education level, employment status and social support) associated with spirituality, religiosity, religious coping, medication adherence and insight.
4. To ascertain the possible clinical characteristics (age of onset of illness, duration of illness, duration of ACT, co-morbid medical illness, class of oral antipsychotics and the presence or absence of depot antipsychotics) associated with spirituality, religiosity, religious coping, medication adherence and insight.

2.4 RESEARCH HYPOTHESIS

1. There is a high prevalence of religiosity, spirituality and religious coping amongst patients with schizophrenia receiving assertive community treatment.
2. Schizophrenic patients receiving ACT have a high degree of adherence to oral antipsychotic medication and a high level of insight.
3. There is a significant association between religiosity, spirituality and religious coping with medication adherence and insight.
4. There are possible associations between socio-demographic and clinical characteristics with religiosity, spirituality, religious coping, insight and medication adherence.

CHAPTER 3

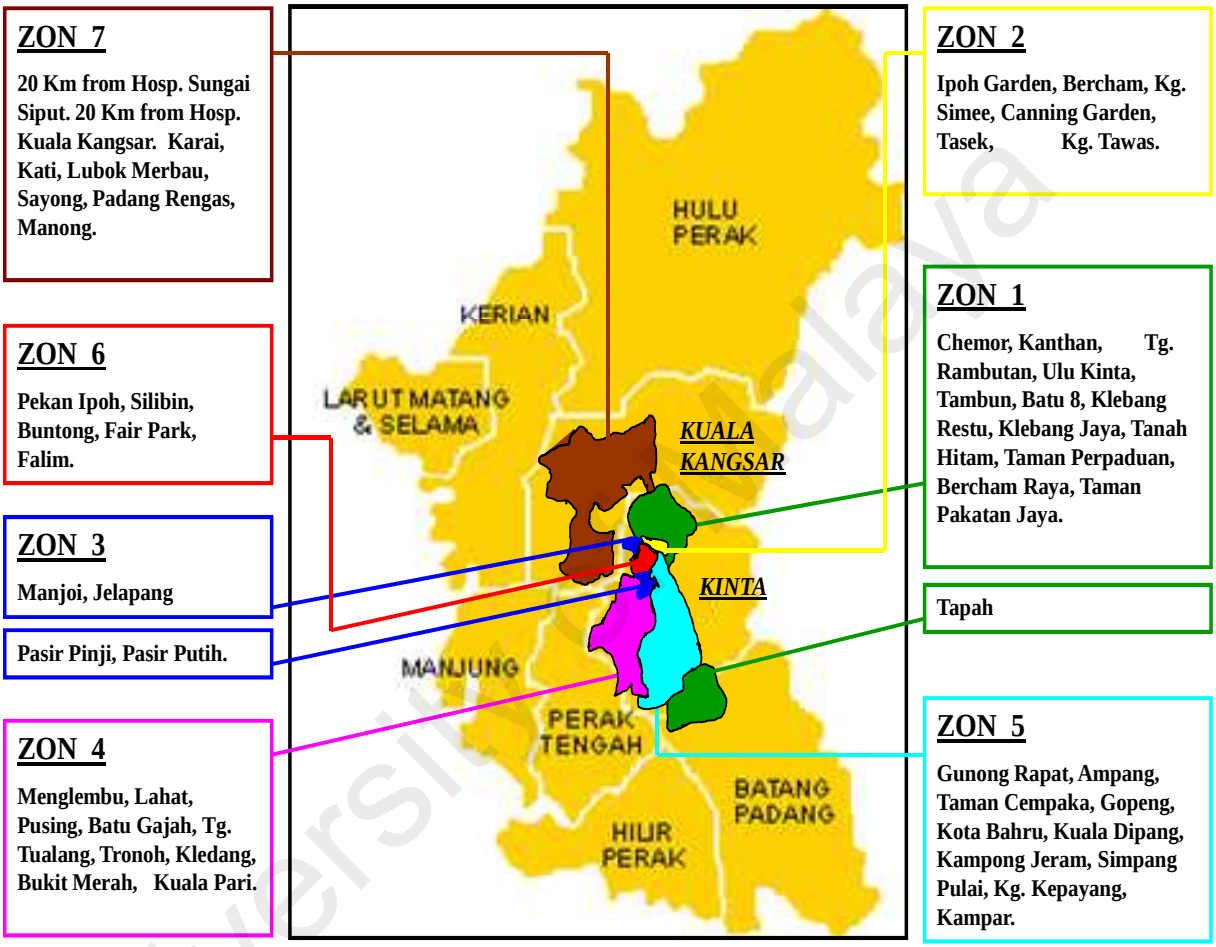
METHODOLOGY

3.1 STUDY SETTING

This study was conducted on patients with schizophrenia receiving Assertive Community Treatment (ACT) provided by Hospital Bahagia Ulu Kinta (HBUK). HBUK is the first and largest mental institution amongst the four mental institutions in Malaysia. Established in 1911, Hospital Bahagia has since then evolved into a major psychiatric referral facility, a training centre for candidates of the Masters of Medicine (Psychiatry) programme and a centre for psychiatric research. In addition to providing inpatient and outpatient services, HBUK also provides expert forensic psychiatric assessment and rehabilitation as well as a well-coordinated community psychiatric service.

The community psychiatric service encompasses a catchment area that is divided into six zones from which the study patients were recruited (Figure 3.1). This zonal division is purely for administrative and logistic purposes. The patients served by the community psychiatric services of Hospital Bahagia epitomise the cultural diversity of Malaysian society.

Figure 3.1: Coverage area of the Community Psychiatric Services of Hospital Bahagia



DISEDIAKAN - SEPTEMBER 2008

3.1.1 Community Psychiatric Service in Hospital Bahagia Ulu Kinta

The community psychiatric service or more commonly known as the Home Care Service in HBUK was established in 2002 and is essentially a hospital-based community service. It adopts the concept of the Assertive Community Treatment (ACT) programme with modifications to best suite the local population. The objectives of the home-care programme are in line with the Ministry of Health Malaysia (2001a) guidelines. The programme is comprehensive and integrated offering a wide range of treatment, rehabilitation and support services with emphasis on continuity of care (Institut Pengurusan Kesihatan, 2007) that is easily available for patients suffering from serious mental illnesses.

A community psychiatrist heads this multidisciplinary team with the assistance of four medical officers. Each zone has three to four nurses or medical assistants who function as case managers and two healthcare attendants assist them. In addition to this, each zone has a pharmacist and an occupational therapist. The pharmacists assist in psycho-educating patients about their medications as well as performing pill-counts to ensure adherence. The occupational therapists assist in the rehabilitation process and facilitate patients in obtaining jobs through the supported employment programme.

There are three main components of the Home Care Service:

1. Early Discharge Programme

   This service aims to provide treatment in the community for patients discharged early from the ward. Prior to discharge, case managers will engage respective family members to establish rapport and assess suitability for home-care. Consent to conduct home visits is obtained and a brief management plan will be outlined.

2. Acute Home Care

   Home visits are done on a weekly basis or more frequently if required for patients with signs and symptoms of impending relapse, those exhibiting aggressive behaviour, in cases where close monitoring for the side effects of medication is required or when switching of medications had just taken place.

3. Assertive Community Treatment (ACT)

   ACT is provided for patients who are relatively well but still require assistance and supervision in terms of medication adherence, functioning ability and for those who are keen on gaining employment. These patients

are visited once a month. Visits that are more frequent can be done whenever the need arises or on a case-to-case basis.

The inclusion criteria for home-care service are as follows:

1. Patients diagnosed with serious mental illnesses (SMI) such as schizophrenia, bipolar disorder and major depressive disorder.
2. Patients with dual diagnosis (SMI plus co-morbid substance abuse or dependence)
3. Patients with a poor history of medication adherence and those who frequently default follow-up at local clinics.
4. Patients living within the coverage area of the respective zones.

The exclusion criteria are as follows:

1. Patients with alcohol or substance abuse/dependence and those with personality disorders without co-morbid SMI.
2. Patients who live in areas inaccessible to the home-care staff.

3.2 STUDY DESIGN

This is a cross-sectional study assessing the prevalence of religiosity, spirituality and religious coping amongst patients with schizophrenia receiving assertive community treatment provided by Hospital Bahagia Ulu Kinta. This study also aims to establish an association between religiosity and spirituality with oral antipsychotic medication adherence. The study was carried out between June 2012 and November 2012.

3.3 SAMPLE COLLECTION

The study population comprised patients with schizophrenia receiving assertive community treatment who fulfilled the inclusion criteria.

Malay patients are exclusively Muslim. The majority of Chinese and Indian patients are Buddhist and Hindu respectively while a small proportion of these two races are also Muslim and Christian.

3.3.1 Sample Size and Calculation

Calculation of sample size was done using the following formula (Naing, 2006)

$$n = \frac{Z^2 P(1-P)}{d^2}$$

n – Sample size

Z – 1.96 (level of confidence: 95%)

P –Expected prevalence of religiosity and religious coping amongst patients with schizophrenia: 45.0% (Mohr et al, 2007)

d - Precision (0.10)

n = 3.8416 x 0.45 x 0.55 / 0.01

= 95

Due to limited resources and time, the precision set for this study is 0.10. The sample size required through calculation is 95. For this study, the sample size targeted was 120.

3.3.2 Sampling and data collection

Universal sampling method was employed whereby all patients fulfilling the inclusion criteria were invited for this study. Patients were visited in their homes during routine home-care visits together with the respective community teams. The Mini International Neuropsychiatric Interview (M.I.N.I) was used to confirm the diagnosis of schizophrenia. The Positive and Negative Symptom Scale (PANSS) was administered to rate the severity of psychotic symptoms and the Yangarber-Hicks criteria was used to screen for religious delusions. One hundred and seventy patients were screened of which one hundred and fifty three met the inclusion criteria and were thus selected to participate in this study. An explanation regarding the study was given to all patients prior to obtaining written informed consent (Appendix 1 & 2).

Demographic data pertaining to age, gender, ethnicity, religion, marital status, educational level, employment and accommodation were ascertained during the interview. Clinical data on duration of illness, number of prior hospital admissions and duration of ACT were obtained from the home-care case notes.

Patients were required to answer three questionnaires pertaining to religiosity (DUKE University Religion Index), spirituality (Ellison's Spirituality Well-Being Scale) and religious coping (Brief RCOPE).

Oral antipsychotic medication adherence was assessed using the Brief Adherence Rating Scale (BARS). Adherence to medication was determined by interviewing the patient, the immediate caregiver and by pill counting which was done together with the case manager and pharmacist. Level of insight was determined using the Scale to assess Unawareness of Mental Disorder (SUMD).

3.3.3 Inclusion criteria

1) Patients diagnosed with schizophrenia using M.I.N.I receiving assertive community treatment.
2) Patients aged 18-60 years.
3) Patients on oral antipsychotic medication monotherapy with or without depot antipsychotic medication.
4) Schizophrenic patients with a PANSS score of less than 60. A cut-off score of less than 60 is indicative of patients who are mildly ill or in remission (Leucht et al, 2005; Opler et al, 2007).
5) Patients who are able to understand and communicate in Bahasa Malaysia or English and who are able to give consent.

3.3.4 Exclusion criteria

1) Patients who are unable to give consent.
2) Patients with religious delusions based on the Yangarber-Hicks criteria.
3) Patients receiving more than one oral antipsychotic agent.
4) Patients only on depot antipsychotic medication.
5) Patients with co-morbid substance abuse.

3.4 STUDY INSTRUMENTS

3.4.1 Socio-demographic and clinical data sheet (Appendix 3)

An identification data sheet was used to record demographic and clinical data of the patients. Demographic variables obtained were age, gender, marital status, race, religion, educational level and employment status. Clinical variables included duration of illness, duration of ACT, number of prior hospitalisations, presence of medical co-morbidity and type of antipsychotic medication.

3.4.2 Mini International Neuropsychiatric Interview v6.0.0 (M.I.N.I)

M.I.N.I is a short structured diagnostic interview designed to diagnose both current and lifetime DSM-IV and ICD-10 psychiatric disorders. It is a relatively brief instrument and consists of different modules corresponding to different diagnostic categories. In this study, module L was used to confirm the diagnosis of schizophrenia. The M.I.N.I has good validity and reliability and has been translated into many different languages (Sheehan, 1998). It has been extensively used in local studies in the field of psychiatry. M.I.N.I English version 6.0.0 was used for this study.

3.4.3 Positive and Negative Syndrome Scale (PANSS)

PANSS is used for measuring positive symptoms, negative symptoms, and a series of general symptoms for patients with different psychosis. The scale has seven positive-symptom items, seven negative-symptom items and sixteen general psychopathology symptom items. Each item is scored on a seven-point severity scale. The 30-item PANSS was conceived as an operational instrument that provides a balanced representation of positive and negative symptoms and gauges their relationship to one another and to global psychopathology. PANSS is widely used in studies for schizophrenia and has been proven useful in dimensional assessments of distinct syndromes in schizophrenia with a high reliability (Kay, 1989).

3.4.4 Screening for religious delusions with the Yangarber-Hicks Criteria (Yangarber-Hicks, 2004) (Appendix 4)

This is a 5-item questionnaire used to screen patients for religious delusions based on a "Yes" or "No" answer. An affirmative response to question 1, 3 and 5 are counted as past religious delusions whereas an affirmative response to questions 2 and 4 indicate current religious delusions. Patients are excluded from the study if they answer "Yes" for any one of the five items.

3.4.5 DUKE University Religion Index (DUREL) (Apendix 5)

This instrument is used to measure religious commitment of the respondents. It consists of five items encompassing three major dimensions of religious commitment including organisational religious activity (ORA, 1 item), non-organisational religious activity (NORA, 1 item) and intrinsic religiosity (IR, 3 items). ORA consists of public religious activities such as frequency of attending religious services or participating in other group-related religious activities. NORA consists of religious activities performed in private, such as prayer or reading the Quran. IR is the degree of personal religious commitment or motivation. The DUREL has an overall score ranging from 5 to 27 (Koenig, 1997). Higher scores are reported by persons who are more religious. It has been translated into the Malay language and validated (Nurasikin, 2010).

3.4.6 Brief RCOPE (Appendix 6)

This scale consists of 14 items measuring religious coping methods of the respondents. It is designed to offer an efficient and theoretically meaningful way to integrate religious dimensions into models and studies of stress, coping, and health. The scale consists of seven positive coping items (P COPE) and seven negative coping items (N COPE). The score of each item ranges from 1"not at all" to 4 "a great deal". The total score ranges from 7 to 28 for the subscale of positive and negative items respectively (Pergament, 2000). The reliability and validity of the translated Malay version of the Brief RCOPE was established in a previous study (Yusoff, 2009).

3.4.7 Ellison's Spirituality Well-Being Scale (Ellison, 1983) (Appendix 7)

This is a non-sectarian scale measuring both existential (EWB) and religious (RWB) well-being. It is a 20-item scale producing a total spirituality score (SWB) of 20-120. It is divided into 10 questions for existential well-being which expresses how well the individual is adjusted to self, community and surroundings. This subscale produces a score of 10-60 indicating the existential notion of life's purposes and life's satisfaction. The second subscale of 10 questions is for religious well-being involving religious practices and commitment. This subscale produces a score of 10-60 indicating a person's well-being as expressed in relation to God. Higher scores reflect higher spiritual beliefs and well-being. This scale has been validated extensively throughout several studies involving medical

outpatients, eating disorder patients and patients who have been sexually abused (Hill, 1999). It has also been translated and validated in the Malay language (Imam, 2009).

3.4.8 The Brief Adherence Rating Scale (BARS) (Appendix 8)

The BARS is a clinician-administered scale of three questions assessing a patient's adherence to antipsychotic medication over the period of one month. Based on the patient's responses, the clinician then records an overall rating of adherence on a visual analogue scale ranging from 0% to 100%. Patients who are fully adherent are those who take their medication ≥80% of the time, partially adherent 50%-70% and poorly adherent <50%. The Brief Adherence Rating Scale provides a sensitive, valid and reliable measure of antipsychotic adherence as compared to electronic monitoring in patients with schizophrenia (Byerly, 2008). It is a simple, quick and easy to administer scale making it applicable for monitoring antipsychotic medication adherence in outpatients with schizophrenia and is feasible for use in community-based settings.

3.4.9 Scale to assess Unawareness of Mental Disorder (SUMD) (Appendix 9)

This is a reliable and valid scale to measure insight (Amador, 1993). The dimensions of insight covered by this scale include awareness of having a mental illness, awareness of the effects of medication, awareness of social consequences of illness, awareness of hallucinatory experiences, delusions and thought disorder, awareness of flat or blunt affect, awareness of anhedonia or loss of interest and awareness of asociality. All SUMD ratings focus on the highest level of insight exhibited during the previous seven days. There nine questions with ratings of 0 (Cannot be assessed or the item is not relevant), 1 (Aware), 2-3 (Somewhat aware) and 4-5 (Unaware). Lower scores indicate better insight.

3.5 DEFINITION OF VARIABLES

3.5.1 Religion

Religion is defined as beliefs, practices and rituals pertaining to the sacred. Religion is organised and is either practised within a community or in private. The concept is deeply rooted in tradition that concerns a group of individuals with similar beliefs and practices pertaining to the sacred (Koenig, 2009).

3.5.2 Spirituality

Spirituality is defined as mental processes dedicated to existential understanding of the divine or non-physical aspects of life (Fernander, 2004). Spirituality pays special emphasis to the appreciation of feelings, thoughts and beliefs concerning the transcendent. It is concerned with matters of meaning and purpose in life, truth and values (Cook, 2004a).

3.5.3 Religious coping

Religious coping methods can be either positive or negative. Positive coping is when the person takes an initiative to nullify the stressor or reorganise its effects. In negative coping, the stressor is intrusive which results in the person giving up the attempt to accomplish goals (Carver, 1987; 1989).

3.5.4 Medication adherence

Adherence is defined as the extent to which a person's behaviour matches the recommendations from a healthcare provider. Adherence to medication is therefore the degree to which the patient's medication intake matches the prescription of the health care provider. Adherence lies on a spectrum from medication refusal to non-adherent to partially adherent to fully adherent (Velligan, 2006). Those who decline to take medication are 'medication refusers', thereby distinguishing them from 'medication acceptors'. Fully adherent patients are those who take the prescribed medication at least 80% of the time. Those who take medication at least 50% to 79% of the time are partially adherent (Velligan, 2009).

3.5.5 Insight

Insight is a multidimensional construct which requires the person to be aware of the presence of a mental disorder, to understand the social implications of the disorder, to be mindful of the necessity for treatment, to be able to recognise the signs and symptoms of the disorder and the attribution of symptoms to the disorder (Amador & David, 1998).

3.6 STATISTICAL ANALYSIS

The data obtained was assessed using the Statistical Package for Social Studies (SPSS) to generate descriptive epidemiological statistics.

Descriptive analysis was done for socio-demographic and clinical variables. Descriptive analysis was also done for religiosity, spirituality, religious coping, medication adherence and insight. The prevalence of religiosity, spirituality and religious coping were analysed. The Kolmogorov-Smirnov statistic was used to determine the normality of the data. The median scores for religiosity, spirituality and religious coping subscales were used to assess correlation with socio-demographic and clinical variables. Chi-square test was used for this purpose.

Further multivariate analysis according to the different religions was done using logistic regression. The correlation between the dependent and independent measures was done using Spearman's correlation.

3.7 ETHICAL CONSIDERATIONS

This study was registered in the National Medical Research Register (NMRR) of the Ministry of Health Malaysia. Ethical approval was obtained from the Ministry of Health Research and Ethics Committee (MREC) (Appendix 10). Further ethical approval was obtained from the Ethics Committee, Hospital Bahagia Ulu Kinta. A written informed consent was obtained from each subject prior to recruitment into this study.

CHAPTER 4

RESULTS

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

One hundred and seventy patients were approached for this study. Three patients did not give consent. Fourteen patients had a PANSS score of more than sixty, of which three patients either had past or current religious delusions based on the Yangarber-Hicks criteria. These patients were thus excluded. Therefore, one hundred and fifty three patients who met the inclusion criteria were invited to participate in this study.

All patients answered the DUREL and Brief RCOPE questionnaires while only one hundred and fourteen patients completed the SWBS questionnaire. All patients were assessed for medication adherence and insight.

Table 4.1: Socio-demographic characteristics of study participants

Characteristic		Mean	SD
Age (years)		40.47	8.46
Characteristic (N=153)		**N**	**%**
Gender	**Male**	97	63.4
	Female	56	36.6
Ethnicity	**Malay**	84	54.9
	Chinese	53	34.6
	Indian	16	10.5
Religion	**Islam**	84	54.9
	Buddhism	48	31.4
	Hinduism	14	9.2
	Christianity	7	4.6
Marital status	**Single**	113	73.9
	Married	40	26.1
Education level	**Primary and below**	24	15.7
	Secondary	116	75.8
	Tertiary	13	8.5
Employment	**Employed**	53	34.6
	Unemployed	100	65.4
Accommodation	**Living alone**	6	3.9
	Living with family	147	96.1

Mean age of the patients is 40.47 years with a standard deviation of 8.46. 63.4% of patients are male while 36.6% are female. 84 (54.9%) patients are Malay, 53 (34.6%) are Chinese and 16 (10.5%) are of Indian ethnicity. More than half of the sample is Muslim (54.9%). Buddhists account for 31.4% while Hindus and Christians account for 9.2% and 4.6% respectively. Only 40 (26.1%) patients are married while 113 (73.9%) are single. 129 (84.3%) patients attained either secondary or tertiary level of education while only 15.7% attained either primary level or below. At the time of study, one-third (34.6%) of patients were employed while two-thirds (65.4%) were unemployed. The majority (96.1%) live with their families.

4.2 CLINICAL CHARACTERISTICS

Table 4.2: Clinical characteristics of study participants

Characteristic		Mean	SD
Age of onset (years)		28.44	6.10
Duration of illness (years)		11.74	6.40
Duration of ACT (months)		19.14	7.70
Number of Admissions		4.25	4.04
Characteristic (N=153)		**N**	**%**
Oral Atypical		136	88.9
• **Atypical Types**	**Risperidone**	62	40.5
	Olanzapine	27	17.6
	Aripiprazole	16	10.5
	Clozapine	12	7.8
	Amisulpride	10	6.5
	Quetiapine	7	4.6
	Paliperidone	2	1.3
Oral Typical		17	11.1
• **Typical Types**	**Haloperidol**	9	5.9
	Chlorpromazine	4	2.6
	Perphenazine	2	1.3
	Sulpiride	1	0.7
	Stellazine	1	0.7
Concomitant Depot		90	58.8
Co-morbid physical illness	**Yes**	26	17.0
	No	127	83.0

Abbreviation: ACT= Assertive Community Treatment, SD= Standard Deviation

The mean age of onset of schizophrenia is 28.44 years (SD 6.10) while the mean duration of illness is 11.74 years (SD 6.40). The average duration of assertive community treatment is 19.14 months (SD 7.70) and the mean number of previous hospitalisations were 4.25 (SD 4.04). Only 26 (17.0%) patients have a medical co-morbidity.

88.9% of patients are on atypical oral antipsychotics while 58.8% receive concomitant depot antipsychotic injections. The majority of patients (40.5%) receive Risperidone followed by Olanzapine (17.6%). 10.5% of patients receive Aripiprazole while 7.8% receive Clozapine. Patients who are on Amisulpride, Quetiapine and Paliperidone account for 6.5%, 4.6% and 1.3% respectively.

4.3: DESCRIPTIVE ANALYSIS OF STUDY VARIABLES

Table 4.3.1: Descriptive analysis of religiosity according to the DUKE University Religiosity Index (DUREL), religious coping according to the Brief RCOPE and spirituality according to the Spiritual Well-Being Scale (SWBS).

	Minimum	Maximum	Mean	SD	Median
DUREL (N=153)					
ORA	1	6	3.82	1.553	4.00
NORA	1	6	4.47	1.906	5.00
IR	3	15	10.94	3.424	12.00
DUREL TOTAL	5	27	16.93	7.357	21.00
Brief RCOPE (N=153)					
PCOPE	7	28	19.28	5.150	21.00
NCOPE	7	28	8.41	2.149	8.00
SWBS (N=114)					
RWB	10	60	43.00	15.914	50.00
EWB	10	60	43.44	10.971	47.00
SWB TOTAL	20	120	86.44	26.399	98.00

Abbreviation: ORA= Organisational religious activity, NORA=Non-organisational religious activity, IR= Intrinsic religiosity, PCOPE= Positive religious coping, NCOPE= Negative religious coping, RWB= Religious well-being, EWB= Existential well-being, SWB= Spiritual well-being, SD= Standard Deviation.

The mean for organisational religious activity (ORA) is 3.82 (SD 1.553) and the median score is 4.00. This indicates that on average, patients participate in religious activities or attend places of worship a few times every month. The mean for non-means that patients pray, meditate or read holy books on a daily basis. The mean score for intrinsic religiosity (IR) is 10.94 (SD 3.424) with a median score of 12 indicating a high degree of personal religious commitment and motivation. The mean total religiosity score for the sample population is 16.93 (SD 7.357) while the median total score is 21 indicating a high degree of religious commitment. 52.9% of patients scored above or equal to the median DUREL total score of 21. The possible range is 5-27, with a score of 27 indicating the highest degree of religious commitment.

The mean score for positive religious coping (PCOPE) is 19.28 (SD 5.510) with a median score of 21 while the mean score for negative religious coping is 8.41 (SD 2.149). Higher scores on the PCOPE indicate positive coping while higher scores on the NCOPE indicate negative coping. 50.8% of patients scored above or equal to the PCOPE median score of 21.

The mean for religious well-being (RWB) is 43.00 (SD 15.914) and the median score is 50. This indicates that 51.8% of patients scored high on the RWB subscale. The mean for existential well-being is 43.44 (SD 10.971) and the median score is 47. This indicates moderate existential well-being. The mean score for total spiritual well being is 86.44 (SD 26.399) while the median score is 98 indicative of overall moderate spiritual well-being. 50.0% of patients scored above or equal to the median SWB total score of 98.

Table 4.3.2: Descriptive analysis of insight according to the Scale to Assess Unawareness of Mental Disorder (SUMD).

(N=153)	Minimum	Maximum	Mean	SD	Median
SUMD (Total)	0	45	17.93	7.354	15.00
SUMD Item 1 -Awareness of mental disorder	0	5	1.54	0.866	1.00
SUMD Item 2 -Awareness of medication effect	0	5	1.74	0.979	1.00
SUMD Item 3 -Awareness of social consequences	0	5	2.04	1.044	2.00

Abbreviation: SUMD= Scale to assess Unawareness of Mental Disorder, SD= Standard Deviation.

The mean insight score is 17.93 (SD 7.354). Higher scores predict poorer insight. 52.9% of patients scored less than or equal to the median SUMD score of 15.

The mean scores for awareness of mental disorder is 1.54 (SD 0.866), achieved effects of medication is 1.74 (SD 0.979) and awareness of social consequences of mental disorder is 2.04 (SD 1.044).

Table 4.3.3: Descriptive analysis of oral medication adherence according to the Brief Adherence Rating Scale (BARS).

(N=153)	Minimum	Maximum	Mean	SD	Median
BARS	10	100	75.56	20.062	90.00

Abbreviation: BARS= Brief Adherence Rating Scale, SD= Standard Deviation.

The mean score for oral antipsychotic medication adherence is 75.56% (SD 20.062) which indicates partial adherence. 50.3% of patients attained a level of oral antipsychotic medication adherence of 90% or more.

Of the 153 patients enrolled in this study, 56.9% achieved full antipsychotic medication adherence, 35.9% were partially adherent while 7.2% have poor adherence.

4.4: ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC AND CLINICAL VARIABLES WITH RELIGIOSITY, RELIGIOUS COPING, SPIRITUALITY, INSIGHT AND ADHERENCE INDICES.

Univariate analysis was done using Chi-square and Fisher's Exact Test wherever appropriate between socio-demographic and clinical variables with the Duke University Religiosity Index subscales, the Brief RCOPE subscales, the Spiritual Well-Being subscales, the Scale to Assess Unawareness of Mental Disorder and the Brief Adherence Rating Scale.

Variables such as age, ethnicity, religion, number of admissions, age of onset, duration of illness, duration of ACT and antipsychotic medication types were re-categorised. The median scores for all scales and sub-scales were used for the purpose of analysis, as the data is not normally distributed.

Table 4.4.1: Univariate analysis of association between socio-demographic and clinical characteristics with organisational religious activity (ORA-DUREL) using chi-square.

Variable (N=153)		ORA≥4 N (%)	ORA<4 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	37 (46.8)	42 (53.2)	1.946	0.635	0.335-1.203	0.163
	>40	43 (58.1)	31 (41.9)				
Gender	**Male**	52 (53.6)	45 (46.4)	0.185	1.156	0.598-2.232	0.667
	Female	28 (50.0)	28 (50.0)				
Ethnicity							
• **Malay**	**Yes**	50 (59.5)	34 (40.5)	3.909	1.912	1.003-3.645	0.048*
	No	30 (43.5)	39 (56.5)				
• **Chinese**	**Yes**	18 (34.0)	35 (66.0)	10.915	0.315	0.157-0.633	0.001*
	No	62 (62.0)	38 (38.0)				
• **Indian**	**Yes**	12 (75.0)	4 (25.0)	3.695	3.044	0.935-9.908	0.055
	No	68 (49.6)	69 (50.4)				
Religion							
• **Muslim**	**Yes**	50 (59.5)	34 (40.5)	3.909	1.912	1.003-3.645	0.048*
	No	30 (43.5)	39 (56.5)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.349	0.066-1.856	0.259
	No	78 (53.4)	68 (46.6)				
• **Hindu**	**Yes**	11 (78.6)	3 (21.4)	4.267	3.720	0.994-13.914	0.039*
	No	69 (49.6)	70 (50.4)				

Abbreviation: ORA= Organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median ORA score=4.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.1, continued

Variable (N=153)		ORA≥4 N (%)	ORA<4 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	17 (35.4)	31 (64.6)	7.980	0.366	0.180-0.743	0.005*
	No	63 (60.0)	42 (40.0)				
Marital status	**Single**	57 (50.4)	56 (49.6)	0.590	0.752	0.364-1.557	0.442
	Married	23 (57.5)	17 (42.5)				
Education level	**Primary and below**	11 (45.8)	13 (54.2)	0.475	0.736	0.307-1.764	0.491
	Secondary, Tertiary	69 (53.5)	60 (46.5)				
Employment status	**Employed**	35 (66.0)	18 (34.0)	6.145	2.377	1.190-4.746	0.013*
	Unemployed	45 (45.0)	55 (55.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	0.909	0.178-4.652	1.000
	With family	77 (52.4)	70 (47.6)				
Co-morbid physical illness	**No**	65 (51.2)	62 (48.8)	0.367	0.769	0.328-1.803	0.545
	Yes	15 (57.7)	11 (42.3)				
Number of admissions	**0-4**	55 (56.1)	43 (43.9)	1.607	1.535	0.790-2.982	0.205
	>4	25 (45.5)	30 (54.5)				
Age of onset	**28 years and below**	39 (48.8)	41 (51.3)	0.841	0.742	0.393-1.404	0.359
	>28 years	41 (56.2)	32 (43.8)				

Abbreviation: ORA= Organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median ORA score=4.00

**Significance level: p<0.05; ¥Fisher's Exact Test*

Table 4.4.1, continued

Variable (N=153)		ORA≥4 N (%)	ORA<4 N (%)	Chi²	OR	95% CI	P-value
Duration of illness	**12 years and below**	51 (54.8)	42 (45.2)	0.619	1.298	0.677-2.488	0.432
	>12 years	29 (48.3)	31 (51.7)				
Duration of ACT	**Less than 20 months**	49 (54.4)	41 (45.6)	0.408	1.234	0.647-2.351	0.523
	≥20 months	31 (49.2)	32 (50.8)				
Oral atypical antipsychotic	**Yes**	71 (52.2)	65 (47.8)	0.003	0.971	0.354-2.666	0.954
	No	9 (52.9)	8 (47.1)				
Concomitant depot	**Yes**	44 (48.9)	46 (51.1)	1.012	0.717	0.375-1.371	0.314
	No	36 (57.1)	27 (42.9)				

Abbreviation: ORA= Organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median ORA score=4.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Malay or Muslim patients are significantly involved in organisational religious activities twice as much than the non-Malays/non-Muslims with an odds ratio of 1.912, p=0.048. Those who practise Hinduism have significantly high odds of organisational religious activity (odds ratio 3.720, p=0.039). On the other hand, Chinese patients have lower odds of organisational religious activity (odds ratio 0.315, p=0.001) as with those who practise Buddhism (odds ratio 0.366, p=0.005). Patients who are working were found to be more involved in organisational religious activities than those who are unemployed with an odds ratio of 2.377, p=0.013, which is statistically significant.

Table 4.4.2: Univariate analysis of association between socio-demographic and clinical characteristics with non-organisational religious activity (NORA-DUREL) using chi-square.

Variable (N=153)		NORA≥5 N (%)	NORA<5 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	37 (46.8)	42 (53.2)	1.506	0.671	0.355-1.270	0.220
	>40	42 (56.8)	32 (43.2)				
Gender	**Male**	47 (48.5)	50 (51.5)	1.073	0.705	0.364-1.367	0.300
	Female	32 (57.1)	24 (42.9)				
Ethnicity							
• **Malay**	**Yes**	48 (57.1)	36 (42.9)	2.263	1.634	0.860-3.105	0.132
	No	31 (44.9)	38 (55.1)				
• **Chinese**	**Yes**	18 (34.0)	35 (66.0)	10.140	0.329	0.164-0.660	0.001*
	No	61 (61.0)	39 (39.0)				
• **Indian**	**Yes**	13 (81.3)	3 (18.8)	6.276	4.662	1.271-17.094	0.012*
	No	66 (48.2)	71 (51.8)				
Religion							
• **Muslim**	**Yes**	48 (57.1)	36 (42.9)	2.263	1.634	0.860-3.105	0.132
	No	31 (44.9)	38 (55.1)				
• **Christian**	**Yes**	1 (14.3)	6 (85.7)	¥	0.145	0.017-1.237	0.077
	No	78 (53.4)	68 (46.6)				
• **Hindu**	**Yes**	12 (85.7)	2 (14.3)	7.167	6.448	1.391-29.880	0.007*
	No	67 (48.2)	72 (51.8)				

Abbreviation: N ORA= Non-organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median NORA score=5.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.2, continued

Variable (N=153)		NORA≥5 N (%)	NORA<5 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	18 (37.5)	30 (62.5)	5.595	0.433	0.215-0.873	0.018*
	No	61 (58.1)	44 (41.9)				
Marital status	**Single**	55 (48.7)	58 (51.3)	1.518	0.632	0.304-1.315	0.218
	Married	24 (60.0)	16 (40.0)				
Education level	**Primary and below**	11 (45.8)	13 (54.2)	0.384	0.759	0.317-1.819	0.536
	Secondary, Tertiary	68 (52.7)	61 (47.3)				
Employment status	**Employed**	32 (60.4)	21 (39.6)	2.482	1.718	0.874-3.379	0.115
	Unemployed	47 (47.0)	53 (53.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	0.934	0.183-4.781	1.000
	With family	76 (51.7)	71 (48.3)				
Co-morbid physical illness	**No**	64 (50.4)	63 (49.6)	0.460	0.745	0.318-1.747	0.497
	Yes	15 (57.7)	11 (42.3)				
Number of admissions	**0-4**	54 (55.1)	44 (44.9)	1.313	1.473	0.759-2.859	0.252
	>4	25 (45.5)	30 (54.5)				
Age of onset	**28 years and below**	37 (46.3)	43 (53.8)	1.946	0.635	0.335-1.203	0.163
	>28 years	42 (57.5)	31 (42.5)				
Duration of illness	**12 years and below**	53 (57.0)	40 (43.0)	2.723	1.733	0.900-3.336	0.099
	>12 years	26 (43.3)	34 (56.7)				

Abbreviation: N ORA= Non-organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median NORA score=5.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.2, continued

Variable (N=153)		NORA≥5 N (%)	NORA<5 N (%)	Chi²	OR	95% CI	P-value
Duration of ACT	**Less than 20 months**	51 (56.7)	39 (43.3)	2.217	1.635	0.854-3.127	0.137
	≥20 months	28 (44.4)	35 (55.6)				
Oral atypical antipsychotic	**Yes**	72 (52.9)	64 (47.1)	0.873	1.607	0.578-4.470	0.360
	No	7 (41.2)	10 (58.8)				
Concomitant depot	**Yes**	40 (44.4)	50 (55.6)	4.524	0.492	0.255-0.949	0.033*****
	No	39 (61.9)	24 (38.1)				

Abbreviation: N ORA= Non-organisational religious activity, OR= Odds ratio, CI= Confidence interval

Median NORA score=5.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Indian patients were found to have significantly higher odds of non-organisational religious activity compared to Malay and Chinese patients with an odds ratio of 4.662, p=0.012. A similar finding was noted amongst patients who practised Hinduism with an odds ratio of 6.448, p=0.007. However, this is accompanied by a wide 95% confidence interval. Malay patients have high odds of non-organisational religious activity (odds ratio 1.634, p=0.132) but the result is not statistically significant. Chinese patients have a significantly lower odds of non-organisational religious activity (odds ratio 0.329, p=0.001) as with those who practise Buddhism (odds ratio 0.433, p=0.018).

Patients who receive concomitant depot antipsychotics were noted to have significantly lower odds of non-organisational religious activity as compared to those only on oral antipsychotics with an odds ratio of 0.492, p=0.033.

Table 4.4.3: Univariate analysis of association between socio-demographic and clinical characteristics with intrinsic religiosity (IR-DUREL) using chi-square.

Variable (N=153)		IR≥12 N (%)	IR<12 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	40 (50.6)	39 (49.4)	1.202	0.669	0.369-1.327	0.273
	>40	44 (59.5)	30 (40.5)				
Gender	**Male**	52 (53.6)	45 (46.4)	0.179	0.867	0.447-1.682	0.672
	Female	32 (57.1)	24 (42.9)				
Ethnicity							
• **Malay**	**Yes**	50 (59.5)	34 (40.5)	1.607	1.514	0.796-2.878	0.205
	No	34 (49.3)	35 (50.7)				
• **Chinese**	**Yes**	21 (39.6)	32 (60.4)	7.646	0.385	0.194-0.764	0.006*****
	No	63 (63.0)	37 (37.0)				
• **Indian**	**Yes**	13 (81.3)	3 (18.8)	5.010	4.028	1.099-14.771	0.025*****
	No	71 (51.8)	66 (48.2)				
Religion							
• **Muslim**	**Yes**	50 (59.5)	34 (40.5)	1.607	1.514	0.796-2.878	0.205
	No	34 (49.3)	35 (50.7)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.312	0.059-1.662	0.245
	No	82 (56.2)	64 (43.8)				

Abbreviation: IR= Intrinsic religiosity, OR= Odds ratio, CI= Confidence interval

*Median IR score=12.00; *Significance level: p<0.05; ¥Fisher's Exact Test*

Table 4.4.3, continued

Variable (N=153)		IR≥12 N (%)	IR<12 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Hindu**	**Yes**	12 (85.7)	2 (14.3)	5.909	5.583	1.205-25.875	0.015*
	No	72 (51.8)	67 (48.2)				
• **Buddhist**	**Yes**	20 (41.7)	28 (58.3)	4.948	0.458	0.228-0.917	0.026*
	No	64 (61.0)	41 (39.0)				
Marital status	**Single**	59 (52.2)	54 (47.8)	1.263	0.656	0.313-1.373	0.261
	Married	25 (62.5)	15 (37.5)				
Education level	**Primary and below**	12 (50.0)	12 (50.0)	0.276	0.792	0.331-1.894	0.599
	Secondary, Tertiary	72 (55.8)	57 (44.2)				
Employment status	**Employed**	35 (66.0)	18 (34.0)	4.061	2.024	1.015-4.037	0.044*
	Unemployed	49 (49.0)	51 (51.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	0.815	0.159-4.171	1.000
	With family	81 (55.1)	66 (44.9)				
Co-morbid physical illness	**No**	68 (53.5)	59 (46.5)	0.557	0.720	0.304-1.708	0.455
	Yes	16 (61.5)	10 (38.5)				
Number of admissions	**0-4**	57 (58.2)	41 (41.8)	1.171	1.442	0.742-2.800	0.279
	>4	27 (49.1)	28 (50.9)				

Abbreviation: IR= Intrinsic religiosity, OR= Odds ratio, CI= Confidence interval

*Median IR score=12.00; *Significance level: p<0.05; ¥Fisher's Exact Test*

Table 4.4.3, continued

Variable (N=153)		IR≥12 N (%)	IR<12 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	40 (50.0)	40 (50.0)	1.627	0.659	0.347-1.252	0.202
	>28 years	44 (60.3)	29 (39.7)				
Duration of illness	**12 years and below**	55 (59.1)	38 (40.9)	1.720	1.547	0.805-2.975	0.190
	>12 years	29 (48.3)	31 (51.7)				
Duration of ACT	**Less than 20 months**	52 (57.8)	38 (42.2)	0.730	1.326	0.694-2.532	0.393
	≥20 months	32 (50.8)	31 (49.2)				
Oral atypical antipsychotic	**Yes**	75 (55.1)	61 (44.9)	0.030	1.093	0.398-3.002	0.863
	No	9 (52.9)	8 (47.1)				
Concomitant depot	**Yes**	44 (48.9)	46 (51.1)	3.192	0.550	0.285-1.063	0.074
	No	40 (63.5)	23 (36.5)				

Abbreviation: IR= Intrinsic religiosity, OR= Odds ratio, CI= Confidence interval

Median IR score=12.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Indian patients have significantly higher odds of intrinsic religiosity compared to the Malays and Chinese with an odds ratio of 4.028, p=0.025. This is a similar finding for those who practise Hinduism (odds ratio 5.583, p=0.015). Muslim patients also have high odds of intrinsic religiosity but the result is not statistically significant. Chinese patients have significantly lower odds of intrinsic religiosity with odds ratio of 0.385, p=0.006 as with those who practise Buddhism (odds ratio 0.458, p=0.026). Working patients have higher odds of intrinsic religiosity compared to patients who are unemployed with an odds ratio of 2.024, p=0.044, a result that is statistically significant.

Table 4.4.4: Univariate analysis of association between socio-demographic and clinical characteristics with religiosity (DUREL-Total score) using chi-square.

Variable (N=153)		DUREL≥21 N (%)	DUREL<21 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	38 (48.1)	41 (51.9)	1.536	0.668	0.353-1.266	0.215
	>40	43 (58.1)	31 (41.9)				
Gender	**Male**	49 (50.5)	48 (49.5)	0.626	0.766	0.395-1.485	0.429
	Female	32 (57.1)	24 (42.9)				
Ethnicity							
• **Malay**	**Yes**	50 (59.5)	34 (40.5)	3.240	1.803	0.947-3.433	0.072
	No	31 (44.9)	38 (55.1)				
• **Chinese**	**Yes**	18 (34.0)	35 (66.0)	11.724	0.302	0.150-0.607	0.001*****
	No	63 (63.0)	37 (37.0)				
• **Indian**	**Yes**	13 (81.3)	3 (18.8)	5.748	4.397	1.199-16.123	0.017*****
	No	68 (49.6)	69 (50.4)				
Religion							
• **Muslim**	**Yes**	50 (59.5)	34 (40.5)	3.240	1.803	0.947-3.433	0.072
	No	31 (44.9)	38 (55.1)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.339	0.064-1.805	0.255
	No	79 (54.1)	67 (45.9)				

Abbreviation: DUREL= Duke University Religion Index, OR= Odds ratio, CI= Confidence interval

Median DUREL score=21.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.4, continued

Variable (N=153)		DUREL≥21 N (%)	DUREL<21 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Hindu**	**Yes**	12 (85.7)	2 (14.3)	6.644	6.087	1.314-28.207	0.010*
	No	69 (49.6)	70 (50.4)				
• **Buddhist**	**Yes**	17 (35.4)	31 (64.6)	8.622	0.351	0.173-0.714	0.003*
	No	64 (61.0)	41 (39.0)				
Marital status	**Single**	56 (49.6)	57 (50.4)	1.986	0.589	0.282-1.234	0.159
	Married	25 (62.5)	15 (37.5)				
Education level	**Primary and below**	11 (45.8)	13 (54.2)	0.577	0.713	0.297-1.710	0.447
	Secondary, Tertiary	70 (54.3)	59 (45.7)				
Employment status	**Employed**	33 (62.3)	20 (37.7)	2.829	1.788	0.906-3.528	0.093
	Unemployed	48 (48.0)	52 (52.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	0.885	0.173-4.527	1.000
	With family	78 (53.1)	69 (46.9)				
Co-morbid physical illness	**No**	65 (51.2)	62 (48.8)	0.929	0.655	0.276-1.554	0.335
	Yes	16 (61.5)	10 (38.5)				
Number of admissions	**0-4**	55 (56.1)	43 (43.9)	1.107	1.427	0.735-2.768	0.293
	>4	26 (47.3)	29 (52.7)				
Age of onset	**28 years and below**	38 (47.5)	42 (52.5)	1.993	0.631	0.333-1.197	0.158
	>28 years	43 (58.9)	30 (41.1)				

Abbreviation: DUREL= Duke University Religion Index, OR= Odds ratio, CI= Confidence interval

Median DUREL score=21.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.4, continued

Variable (N=153)		DUREL≥21 N (%)	DUREL<21 N (%)	Chi²	OR	95% CI	P-value
Duration of illness	**12 years and below**	54 (58.1)	39 (41.9)	2.499	1.692	0.880-3.256	0.114
	>12 years	27 (45.0)	33 (55.0)				
Duration of ACT	**Less than 20 months**	52 (57.8)	38 (42.2)	2.052	1.604	0.839-3.068	0.152
	≥20 months	29 (46.0)	34 (54.0)				
Oral atypical antipsychotic	**Yes**	73 (53.7)	63 (46.3)	0.266	1.304	0.475-3.590	0.606
	No	8 (47.1)	9 (52.9)				
Concomitant depot	**Yes**	42 (46.7)	48 (53.3)	3.454	0.538	0.279-1.037	0.063
	No	39 (61.9)	24 (38.1)				

Abbreviation: DUREL= Duke University Religion Index, OR= Odds ratio, CI= Confidence interval

Median DUREL score=21.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Indian patients have higher odds of being religious compared to the non-Indians with an odds ratio of 4.379, p=0.017 as with those who practise Hinduism (odds ratio 6.087, p=0.010). Though both results are statistically significant, they are accompanied by a wide 95% confidence interval. Chinese patients have a significantly lower odds of religiosity (odds ratio 0.302, p=0.001), similar to those who practise Buddhism (odds ratio 0.351, p=0.003).

Patients who practise Islam, those who are employed, patients with illness duration of less than 12 years, those who have been receiving ACT for less than 20 months and patients on oral atypical antipsychotics appear to have greater odds of attaining high religiosity scores. However, these associations are not statistically significant. Differences in age and gender have no significant effect on the degree of religious commitment.

Table 4.4.5: Univariate analysis of association between socio-demographic and clinical characteristics with positive religious coping (PCOPE) using chi-square.

Variable (N=153)		PCOPE≥21 N (%)	PCOPE<21 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	34 (43.0)	45 (57.0)	0.038	0.939	0.495-1.779	0.846
	>40	33 (44.6)	41 (55.4)				
Gender	**Male**	41 (42.3)	56 (57.7)	0.250	0.845	0.436-1.638	0.617
	Female	26 (46.4)	30 (53.6)				
Ethnicity							
• **Malay**	**Yes**	43 (51.2)	41 (48.8)	4.143	1.966	1.022-3.784	0.042*
	No	24 (34.8)	45 (65.2)				
• **Chinese**	**Yes**	14 (26.4)	39 (73.6)	9.946	0.318	0.154-0.658	0.002*
	No	53 (53.0)	47 (47.0)				
• **Indian**	**Yes**	10 (62.5)	6 (37.5)	2.541	2.339	0.804-6.803	0.111
	No	57 (41.6)	80 (58.4)				
Religion							
• **Muslim**	**Yes**	43 (51.2)	41 (48.8)	4.143	1.966	1.022-3.784	0.042*
	No	24 (34.8)	45 (65.2)				
• **Christian**	**Yes**	1 (14.3)	6 (85.7)	¥	0.202	0.024-1.720	0.137
	No	66 (45.2)	80 (54.8)				
• **Hindu**	**Yes**	9 (64.3)	5 (35.7)	2.630	2.514	0.801-7.892	0.105
	No	58 (41.7)	81 (58.3)				

Abbreviation: PCOPE= Positive religious coping, OR= Odds ratio, CI= Confidence interval

Median PCOPE score=21.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.5, continued

Variable (N=153)		PCOPE≥21 N (%)	PCOPE<21 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	14 (29.2)	34 (70.8)	6.077	0.404	0.195-0.839	0.014*
	No	53 (50.5)	52 (49.5)				
Marital status	**Single**	45 (39.8)	68 (60.2)	2.765	0.541	0.261-1.121	0.096
	Married	22 (55.0)	18 (45.0)				
Education level	**Primary and below**	9 (37.5)	15 (62.5)	0.458	0.734	0.300-1.800	0.499
	Secondary, Tertiary	58 (45.0)	71 (55.0)				
Employment status	**Employed**	31 (58.5)	22 (41.5)	7.119	2.505	1.266-4.955	0.008*
	Unemployed	36 (36.0)	64 (64.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	1.297	0.253-6.640	1.000
	With family	64 (43.5)	83 (56.5)				
Co-morbid physical illness	**No**	55 (43.3)	72 (56.7)	0.071	0.891	0.382-2.079	0.790
	Yes	12 (46.2)	14 (53.8)				
Number of admissions	**0-4**	46 (46.9)	52 (53.1)	1.098	1.432	0.730-2.808	0.295
	>4	21 (38.2)	34 (61.8)				
Duration of illness	**12 years and below**	46 (49.5)	47 (50.5)	3.099	1.818	0.932-3.546	0.078
	>12 years	21 (35.0)	39 (65.0)				
Duration of ACT	**Less than 20 months**	44 (48.9)	46 (51.1)	2.308	1.664	0.861-3.214	0.129
	≥20 months	23 (36.5)	40 (63.5)				

Abbreviation: PCOPE= Positive religious coping, OR= Odds ratio, CI= Confidence interval

Median PCOPE score=21.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.5, continued

Variable (N=153)		PCOPE≥21 N (%)	PCOPE<21 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	34 (42.5)	46 (57.5)	0.114	0.896	0.473-1.698	0.736
	>28 years	33 (45.2)	40 (54.8)				
Oral atypical antipsychotic	**Yes**	60 (44.1)	76 (55.9)	0.053	1.128	0.405-3.139	0.818
	No	7 (41.2)	10 (58.8)				
Concomitant depot	**Yes**	36 (40.0)	54 (60.0)	1.276	0.688	0..359-1.318	0.259
	No	31 (49.2)	32 (50.8)				

Abbreviation: PCOPE= Positive religious coping, OR= Odds ratio, CI= Confidence interval

Median PCOPE score=21.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Malay or Muslim patients are more likely to have positive religious coping (odds ratio 1.996, p=0.042) while Chinese and patients who practise Buddhism have a significantly lower odds of positive religious coping with odds ratio 0.318, p=0.002 and odds ratio of 0.404, p=0.014 respectively. Indian patients and those who practise Hinduism are also more likely to have positive religious coping but the result is not statistically significant. Patients who are employed were noted to have higher odds of positive coping than those who are unemployed with an odds ratio of 2.505, p=0.008.

Those who are single are less likely to adopt positive coping than patients who are married but the result is not statistically significant. Differences in age, gender, level of education and social support are not associated with positive religious coping.

Table 4.4.6: Univariate analysis of association between socio-demographic and clinical characteristics with negative religious coping (NCOPE) using chi-square.

Variable (N=153)		NCOPE>8 N (%)	NCOPE≤8 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	34 (43.0)	45 (57.0)	0.234	1.172	0.615-2.235	0.629
	>40	29 (39.2)	45 (60.8)				
Gender	**Male**	43 (44.3)	54 (55.7)	1.088	1.433	0.728-2.823	0.297
	Female	20 (35.7)	36 (64.3)				
Ethnicity							
• **Malay**	**Yes**	33 (39.3)	51 (60.7)	0.275	0.841	0.441-1.606	0.600
	No	30 (43.5)	39 (56.5)				
• **Chinese**	**Yes**	26 (49.1)	27 (50.9)	2.079	1.640	0.835-3.218	0.149
	No	37 (37.0)	63 (63.0)				
• **Indian**	**Yes**	4 (25.0)	12 (75.0)	1.930	0.441	0.135-1.436	0.165
	No	59 (43.1)	78 (56.9)				
Religion							
• **Muslim**	**Yes**	33 (39.3)	51 (60.7)	0.275	0.841	0.441-1.606	0.600
	No	30 (43.5)	39 (56.5)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.557	0.105-2.968	0.701
	No	61 (41.8)	85 (58.2)				
• **Hindu**	**Yes**	4 (28.6)	10 (71.4)	1.011	0.542	0.162-1.814	0.315
	No	59 (42.4)	80 (57.6)				

Abbreviation: NCOPE= Negative religious coping, OR= Odds ratio, CI= Confidence interval

Median NCOPE score=8.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.6, continued

Variable (N=153)		NCOPE>8 N (%)	NCOPE≤8 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	24 (50.0)	24 (50.0)	2.248	1.692	0.848-3.376	0.134
	No	39 (37.1)	66 (62.9)				
Marital status	**Single**	52 (46.0)	61 (54.0)	4.182	2.247	1.024-4.934	0.041*
	Married	11 (27.5)	29 (72.5)				
Education level	**Primary and below**	11 (45.8)	13 (54.2)	0.255	1.253	0.521-3.011	0.614
	Secondary, Tertiary	52 (40.3)	77 (59.7)				
Employment status	**Employed**	16 (30.2)	37 (69.8)	4.042	0.488	0.241-0.988	0.044*
	Unemployed	47 (47.0)	53 (53.0)				
Accommodation	**Living alone**	4 (66.7)	2 (33.3)	¥	2.983	0.529-16.812	0.230
	With family	59 (40.1)	88 (59.9)				
Co-morbid physical illness	**No**	54 (42.5)	73 (57.5)	0.557	1.397	0.579-3.373	0.456
	Yes	9 (34.6)	17 (65.4)				
Number of admissions	**0-4**	36 (36.7)	62 (63.3)	2.221	0.602	0.308-1.176	0.136
	>4	27 (49.1)	28 (50.9)				
Duration of illness	**12 years and below**	34 (36.6)	59 (63.4)	2.087	0.616	0.319-1.191	0.149
	>12 years	29 (48.3)	31 (51.7)				
Duration of ACT	**Less than 20 months**	33 (36.7)	57 (63.3)	1.835	0.637	0.331-1.225	0.176
	≥20 months	30 (47.6)	33 (52.4)				

Abbreviation: NCOPE= Negative religious coping, OR= Odds ratio, CI= Confidence interval

Median NCOPE score=8.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.6, continued

Variable (N=153)		NCOPE>8 N (%)	NCOPE≤8 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	34 (42.5)	46 (57.5)	0.121	1.121	0.588-2.138	0.728
	>28 years	29 (39.7)	44 (60.3)				
Oral atypical antipsychotic	**Yes**	55 (40.4)	81 (59.6)	0.273	0.764	0.278-2.102	0.601
	No	8 (47.1)	9 (52.9)				
Concomitant depot	**Yes**	42 (46.7)	48 (53.3)	2.720	1.750	0.898-3.412	0.099
	No	21 (33.3)	42 (66.7)				

Abbreviation: NCOPE= Negative religious coping, OR= Odds ratio, CI= Confidence interval

Median NCOPE score=8.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Unmarried patients are more likely to adopt negative coping compared to patients who are married (odds ratio of 2.247, p=0.041). Employment seems to be a significant protective factor against negative coping with odds ratio of 0.448, p=0.044. Age, gender and education level are not significant predictors of negative religious coping.

Table 4.4.7: Univariate analysis of association between socio-demographic and clinical characteristics with religious well-being (RWB-SWBS) using chi-square.

Variable (N=114)		RWB≥50 N (%)	RWB<50 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	28 (42.4)	38 (57.6)	3.465	0.404	0.188-0.870	0.089
	>40	31 (64.6)	17 (35.4)				
Gender	**Male**	35 (48.6)	37 (51.4)	0.773	0.709	0.330-1.526	0.379
	Female	24 (57.1)	18 (42.9)				
Ethnicity							
• **Malay**	**Yes**	38 (51.4)	36 (48.6)	0.014	0.955	0.442-2.063	0.907
	No	21 (52.5)	19 (47.5)				
• **Chinese**	**Yes**	14 (45.2)	17 (54.8)	0.741	0.695	0.304-1.593	0.389
	No	45 (54.2)	38 (45.8)				
• **Indian**	**Yes**	7 (77.8)	2 (22.2)	¥	3.567	0.708-17.978	0.165
	No	52 (49.5)	53 (50.5)				
Religion							
• **Muslim**	**Yes**	38 (51.4)	36 (48.6)	0.014	0.955	0.442-2.063	0.907
	No	21 (52.5)	19 (47.5)				
• **Christian**	**Yes**	0 (0)	3 (100.0)				
	No	59 (53.2)	52 (46.8)				
• **Hindu**	**Yes**	7 (87.5)	1 (12.5)	¥	7.269	0.864-61.146	0.047*
	No	52 (49.1)	54 (50.9)				

Abbreviation: RWB= Religious Well-Being, OR= Odds ratio, CI= Confidence interval

Median RWB score=50.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.7, continued

Variable (N=114)		RWB≥50 N (%)	RWB<50 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	14 (48.3)	15 (51.7)	0.188	0.830	0.357-1.929	0.664
	No	45 (52.9)	40 (47.1)				
Marital status	**Single**	39 (46.4)	45 (53.6)	3.626	0.433	0.181-1.036	0.035*
	Married	20 (66.7)	10 (33.3)				
Education level	**Primary and below**	7 (77.8)	2 (22.2)	2.650	3.567	0.708-17.978	0.104
	Secondary, Tertiary	52 (49.5)	53 (50.5)				
Employment status	**Employed**	24 (55.8)	19 (44.2)	0.456	1.299	0.607-2.780	0.500
	Unemployed	35 (49.3)	36 (50.7)				
Accommodation	**Living alone**	2 (40.0)	3 (60.0)	¥	0.608	0.098-3.785	0.671
	With family	57 (52.3)	52 (47.7)				
Co-morbid physical illness	**No**	49 (50.5)	48 (49.5)	0.400	0.715	0.251-2.031	0.527
	Yes	10 (58.8)	7 (41.2)				
Number of admissions	**0-4**	42 (53.2)	37 (46.8)	0.205	1.202	0.542-2.666	0.651
	>4	17 (48.6)	18 (51.4)				
Duration of illness	**12 years and below**	40 (50.6)	39 (49.4)	0.130	0.864	0.389-1.918	0.719
	>12 years	19 (54.3)	16 (45.7)				
Duration of ACT	**Less than 20 months**	39 (55.7)	31 (44.3)	1.139	1.510	0.707-3.222	0.286
	≥20 months	20 (45.5)	24 (54.5)				

Abbreviation: RWB= Religious Well-Being, OR= Odds ratio, CI= Confidence interval

Median RWB score=50.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.7, continued

Variable (N=114)		RWB≥50 N (%)	RWB<50 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	27 (43.5)	35 (56.5)	3.666	0.482	0.227-1.022	0.066
	>28 years	32 (61.5)	20 (38.5)				
Oral atypical antipsychotic	**Yes**	52 (50.5)	51 (49.5)	0.688	0.583	0.161-2.112	0.407
	No	7 (63.6)	4 (36.4)				
Concomitant depot	**Yes**	28 (45.9)	33 (54.1)	1.800	0.602	0.286-1.266	0.180
	No	31 (58.5)	22 (41.5)				

Abbreviation: RWB= Religious Well-Being, OR= Odds ratio, CI= Confidence interval

Median RWB score=50.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Hindu patients have high odds of religious well-being compared to the non-Hindus with odds ratio of 7.269, p=0.047. Patients who are unmarried have significantly lower odds of religious well-being with and odds ratio of 0.433, p=0.035. There are no significant differences in religious well-being with regards to age, gender, education level, employment status and other clinical variables.

Table 4.4.8: Univariate analysis of association between socio-demographic and clinical characteristics with existential well-being (EWB-SWBS) using chi-square.

Variable (N=114)		EWB≥47 N (%)	EWB<47 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	29 (43.9)	37 (56.1)	2.303	0.560	0.264-1.188	0.129
	>40	28 (58.3)	20 (41.7)				
Gender	**Male**	37 (51.4)	35 (48.6)	0.151	1.163	0.543-2.491	0.698
	Female	20 (47.6)	22 (52.4)				
Ethnicity							
• **Malay**	**Yes**	40 (54.1)	34 (45.9)	1.386	1.592	0.733-3.458	0.239
	No	17 (42.5)	23 (57.5)				
• **Chinese**	**Yes**	12 (38.7)	19 (61.3)	2.171	0.533	0.230-1.238	0.141
	No	45 (54.2)	38 (45.8)				
• **Indian**	**Yes**	5 (55.6)	4 (44.4)	¥	1.274	0.324-5.010	1.000
	No	52 (49.5)	53 (50.5)				
Religion							
• **Muslim**	**Yes**	40 (54.1)	34 (45.9)	1.386	1.592	0.733-3.458	0.239
	No	17 (42.5)	23 (57.5)				
• **Christian**	**Yes**	0 (0)	3 (100.0)				
	No	57 (51.4)	54 (48.6)				
• **Hindu**	**Yes**	5 (62.5)	3 (37.5)	¥	1.731	0.394-7.612	0.716
	No	52 (49.1)	54 (50.9)				

Abbreviation: EWB= Existential Well-Being, OR= Odds ratio, CI= Confidence interval

Median EWB score=47.00

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.8, continued

Variable (N=114)		EWB≥47 N (%)	EWB<47 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	12 (41.4)	17 (58.6)	1.156	0.627	0.267-1.472	0.282
	No	45 (52.9)	40 (47.1)				
Marital status	**Single**	39 (46.4)	45 (53.6)	1.629	0.578	0.248-1.348	0.202
	Married	18 (60.0)	12 (40.0)				
Education level	**Primary and below**	6 (66.7)	3 (33.3)	1.086	2.118	0.503-8.918	0.297
	Secondary, Tertiary	51 (48.6)	54 (51.4)				
Employment status	**Employed**	22 (51.2)	21 (48.8)	0.037	1.078	0.505-2.299	0.847
	Unemployed	35 (49.3)	36 (50.7)				
Accommodation	**Living alone**	2 (40.0)	3 (60.0)	¥	0.655	0.105-4.073	1.000
	With family	55 (50.5)	54 (49.5)				
Co-morbid physical illness	**No**	47 (48.5)	50 (51.5)	0.622	0.658	0.231-1.870	0.430
	Yes	10 (58.8)	7 (41.2)				
Number of admissions	**0-4**	39 (49.4)	40 (50.6)	0.041	0.921	0.415-2.042	0.839
	>4	18 (51.4)	17 (48.6)				
Duration of illness	**12 years and below**	40 (50.6)	39 (49.4)	0.041	1.086	0.490-2.408	0.839
	>12 years	17 (48.6)	18 (51.4)				
Duration of ACT	**Less than 20 months**	37 (52.9)	33 (47.1)	0.592	1.345	0.631-2.867	0.442
	≥20 months	20 (45.5)	24 (54.5)				

Abbreviation: EWB= Existential Well-Being, OR= Odds ratio, CI= Confidence interval

Median EWB score=47.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.8, continued

Variable (N=114)		EWB≥47 N (%)	EWB<47 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	27 (43.5)	35 (56.5)	2.263	0.566	0.269-1.191	0.132
	>28 years	30 (57.7)	22 (42.3)				
Oral atypical antipsychotic	**Yes**	50 (48.5)	53 (51.5)	0.906	0.539	0.149-1.954	0.341
	No	7 (63.6)	4 (36.4)				
Concomitant depot	**Yes**	30 (49.2)	31 (50.8)	0.035	0.932	0.446-1.946	0.851
	No	27 (50.9)	26 (49.1)				

Abbreviation: EWB= Existential Well-Being, OR= Odds ratio, CI= Confidence interval

Median EWB score=47.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Muslim and Hindu patients have higher odds of existential well-being but the results are not significant. There are no socio-demographic and clinical variables significantly associated with existential well-being.

Table 4.4.9: Univariate analysis of association between socio-demographic and clinical characteristics with spirituality (SWB-Total Score) using chi-square.

Variable (N=114)		SWB≥98 N (%)	SWB<98 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	27 (40.9)	39 (59.1)	3.182	0.415	0.194-0.891	0.093
	>40	30 (62.5)	18 (37.5)				
Gender	**Male**	35 (48.6)	37 (51.4)	0.151	0.860	0.401-1.842	0.698
	Female	22 (52.4)	20 (47.6)				
Ethnicity							
• **Malay**	**Yes**	38 (51.4)	36 (48.6)	0.154	1.167	0.540-2.520	0.695
	No	19 (45.5)	21 (52.5)				
• **Chinese**	**Yes**	12 (38.7)	19 (61.3)	2.171	0.533	0.230-1.238	0.141
	No	45 (54.2)	38 (45.8)				
• **Indian**	**Yes**	7 (77.8)	2 (22.2)	¥	3.850	0.764-19.405	0.162
	No	50 (47.6)	55 (52.4)				
Religion							
• **Muslim**	**Yes**	38 (51.4)	36 (48.6)	0.154	1.167	0.540-2.520	0.695
	No	19 (45.5)	21 (52.5)				
• **Christian**	**Yes**	0 (0)	3 (100)				
	No	57 (51.4)	54 (48.6)				
• **Hindu**	**Yes**	7 (87.5)	1 (12.5)	¥	7.840	0.932-65.953	0.048*****
	No	50 (47.2)	56 (52.8)				

Abbreviation: SWB= Spiritual Well-Being, OR= Odds ratio, CI= Confidence interval

Median SWB score=98.00

Significance level: p<0.05

¥Fisher's Exact Test

Table 4.4.9, continued

Variable (N=114)		SWB≥98 N (%)	SWB<98 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	12 (41.4)	17 (58.6)	1.156	0.627	0.267-1.472	0.282
	No	45 (52.9)	40 (47.1)				
Marital status	**Single**	38 (45.2)	46 (54.8)	2.895	0.478	0.203-1.128	0.089
	Married	19 (63.3)	11 (36.7)				
Education level	**Primary and below**	6 (66.7)	3 (33.3)	¥	2.118	0.503-8.918	0.490
	Secondary, Tertiary	51 (48.6)	54 (51.4)				
Employment status	**Employed**	23 (53.5)	20 (46.5)	0.336	1.251	0.586-2.673	0.562
	Unemployed	34 (47.9)	37 (52.1)				
Accommodation	**Living alone**	2 (40.0)	3 (60.0)	¥	0.655	0.105-4.073	1.000
	With family	55 (50.5)	54 (49.5)				
Co-morbid physical illness	**No**	47 (48.5)	50 (51.5)	0.622	0.658	0.231-1.870	0.430
	Yes	10 (58.8)	7 (41.2)				
Number of admissions	**0-4**	41 (51.9)	38 (48.1)	0.371	1.281	0.577-2.846	0.542
	>4	16 (45.7)	19 (54.3)				
Duration of illness	**12 years and below**	39 (49.4)	40 (50.6)	0.041	0.921	0.415-2.042	0.839
	>12 years	18 (51.4)	17 (48.6)				
Duration of ACT	**Less than 20 months**	37 (52.9)	33 (47.1)	0.592	1.345	0.631-2.867	0.442
	≥20 months	20 (45.5)	24 (54.5)				

Abbreviation: SWB= Spiritual Well-Being, OR= Odds ratio, CI= Confidence interval

Median SWB score=98.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.9, continued

Variable (N=114)		SWB≥98 N (%)	SWB<98 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	26 (41.9)	36 (58.1)	3.536	0.489	0.231-1.035	0.087
	>28 years	31 (59.6)	21 (40.4)				
Oral atypical antipsychotic	**Yes.**	50 (48.5)	53 (51.5)	0.906	0.539	0.149-1.954	0.341
	No	7 (63.6)	4 (36.4)				
Concomitant depot	**Yes**	28 (45.9)	33 (54.1)	0.882	0.702	0.335-1.470	0.348
	No	29 (54.7)	24 (45.3)				

Abbreviation: SWB= Spiritual Well-Being, OR= Odds ratio, CI= Confidence interval

Median SWB score=98.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Patients who practise Hinduism have higher levels of spiritual well-being compared to the non-Hindus with an odds ratio of 7.840, p=0.048. Muslim patients also have high odds of spiritual well-being but the result is not significant. Patients who are not married are less likely to have high spiritual well-being scores compared to married patients but the result is not statistically significant. There are no significant differences in spiritual well-being with regards to age, gender, educational level and employment status.

Table 4.4.10: Univariate analysis of association between socio-demographic and clinical characteristics with insight (SUMD) using chi-square.

Variable (N=153)		SUMD≤15 N (%)	SUMD>15 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	39 (49.4)	40 (50.6)	0.837	0.743	0.393-1.405	0.360
	>40	42 (56.8)	32 (43.2)				
Gender	**Male**	50 (51.5)	47 (48.5)	0.207	0.858	0.443-1.661	0.649
	Female	31 (55.4)	25 (44.6)				
Ethnicity							
• **Malay**	**Yes**	47 (56.0)	37 (44.0)	0.678	1.308	0.690-2.477	0.410
	No	34 (49.3)	35 (50.7)				
• **Chinese**	**Yes**	22 (41.5)	31 (58.5)	4.254	0.493	0.251-0.970	0.039*****
	No	59 (59.0)	41 (41.0)				
• **Indian**	**Yes**	12 (75.0)	4 (25.0)	3.490	2.957	0.908-9.623	0.062
	No	69 (50.4)	68 (49.6)				
Religion							
• **Muslim**	**Yes**	47 (56.0)	37 (44.0)	0.678	1.308	0.690-2.477	0.410
	No	34 (49.3)	35 (50.7)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.339	0.064-1.805	0.255
	No	79 (54.1)	67 (45.9)				
• **Hindu**	**Yes**	11 (78.6)	3 (21.4)	4.063	3.614	0.966-13.519	0.044*****
	No	70 (50.4)	69 (49.6)				

Abbreviation: SUMD= Scale to Assess Unawareness of Mental Disorder, OR= Odds ratio, CI= Confidence interval

Median SUMD score=15.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.10, continued

Variable (N=153)		SUMD≤15 N (%)	SUMD>15 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	21 (43.8)	27 (56.3)	0.644	0.583	0.293-1.162	0.124
	No	60 (57.1)	45 (42.9)				
Marital status	**Single**	57 (50.4)	56 (49.6)	1.083	0.679	0.326-1.411	0.298
	Married	24 (60.0)	16 (40.0)				
Education level	**Primary and below**	10 (41.7)	14 (58.3)	1.452	0.584	0.241-1.410	0.228
	Secondary, Tertiary	71 (55.0)	58 (45.0)				
Employment status	**Employed**	33 (62.3)	20 (37.7)	2.829	1.788	0.906-3.528	0.093
	Unemployed	48 (48.0)	52 (52.0)				
Accommodation	**Living alone**	3 (50.0)	3 (50.0)	¥	0.885	0.173-4.527	1.000
	With family	78 (53.1)	69 (46.9)				
Co-morbid physical illness	**No**	66 (52.0)	61 (48.0)	0.284	0.793	0.338-1.861	0.594
	Yes	15 (57.7)	11 (42.3)				
Number of admissions	**0-4**	55 (56.1)	43 (43.9)	1.107	1.427	0.735-2.768	0.293
	>4	26 (47.3)	29 (52.7)				
Duration of illness	**12 years and below**	53 (57.0)	40 (43.0)	1.560	1.514	0.789-2.908	0.212
	>12 years	28 (46.7)	32 (53.3)				
Duration of ACT	**Less than 20 months**	51 (56.7)	39 (43.3)	1.218	1.438	0.753-2.746	0.270
	≥20 months	30 (47.6)	33 (52.4)				

Abbreviation: SUMD= Scale to Assess Unawareness of Mental Disorder, OR= Odds ratio, CI= Confidence interval

Median SUMD score=15.00

***Significance level: p<0.05; ¥Fisher's Exact Test*

Table 4.4.10, continued

Variable (N=153)		SUMD≤15 N (%)	SUMD>15 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	39 (48.8)	41 (51.3)	1.182	0.702	0.371-1.329	0.277
	>28 years	42 (57.5)	31 (42.5)				
Oral atypical antipsychotic	**Yes**	73 (53.7)	63 (46.3)	0.266	1.304	0.475-3.580	0.606
	No	8 (47.1)	9 (52.9)				
Concomitant depot	**Yes**	41 (45.6)	49 (54.4)	4.786	0.481	0.249-0.931	0.029*****
	No	40 (63.5)	23 (36.5)				

Abbreviation: SUMD= Scale to Assess Unawareness of Mental Disorder, OR= Odds ratio, CI= Confidence interval

Median SUMD score=15.00

***Significance level: p<0.05*

¥Fisher's Exact Test

Devotees of Hinduism have high odds of attaining good insight with a significant odds ratio of 3.614, p=0.044. Malay and Indian patients are also more likely to have good insight but the results are not significant. Chinese patients seem to have significantly poorer insight compared to the Malays and Indians (odds ratio 0.493, p=0.039). Those who work have better insight than those who are unemployed but the result is not significant. Patients receiving concomitant depot antipsychotics have significantly lower insight with odds ratio of 0.481, p=0.029.

Age, gender, marital status, level of education, duration of illness and duration of ACT have no significant bearing on insight.

Table 4.4.11: Univariate analysis of association between socio-demographic and clinical characteristics with oral medication adherence (BARS) using chi-square.

Variable (N=153)		BARS≥90 N (%)	BARS<90 N (%)	Chi²	OR	95% CI	P-value
Age	**≤40**	40 (50.6)	39 (49.4)	0.006	1.026	0.544-1.934	0.938
	>40	37 (50.0)	37 (50.0)				
Gender	**Male**	45 (46.4)	52 (53.6)	1.642	0.649	0.335-1.259	0.200
	Female	32 (57.1)	24 (42.9)				
Ethnicity							
• **Malay**	**Yes**	45 (53.6)	39 (46.4)	0.784	1.334	0.705-2.526	0.376
	No	32 (46.4)	37 (53.6)				
• **Chinese**	**Yes**	20 (37.7)	33 (62.3)	5.142	0.457	0.231-0.904	0.023*
	No	57 (57.0)	43 (43.0)				
• **Indian**	**Yes**	12 (75.0)	4 (25.0)	4.351	3.323	1.021-10.817	0.037*
	No	65 (47.4)	72 (52.6)				
Religion							
• **Muslim**	**Yes**	45 (53.6)	39 (46.4)	0.784	1.334	0.705-2.526	0.376
	No	32 (46.4)	37 (53.6)				
• **Christian**	**Yes**	2 (28.6)	5 (71.4)	¥	0.379	0.071-2.015	0.276
	No	75 (51.4)	71 (48.6)				
• **Hindu**	**Yes**	11 (78.6)	3 (21.4)	4.918	4.056	1.084-15.171	0.027*
	No	66 (47.5)	73 (52.5)				

Abbreviation: BARS= Brief Adherence Rating Scale, OR= Odds ratio, CI= Confidence interval

Median BARS score=90

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.11, continued

Variable (N=153)		BARS≥90 N (%)	BARS<90 N (%)	Chi²	OR	95% CI	P-value
Religion							
• **Buddhist**	**Yes**	19 (39.6)	29 (60.4)	3.229	0.531	0.265-1.063	0.025*
	No	58 (55.2)	47 (44.8)				
Marital status	**Single**	55 (48.7)	58 (51.3)	0.473	0.776	0.376-1.600	0.492
	Married	22 (55.0)	18 (45.0)				
Education level	**Primary and below**	10 (41.7)	14 (58.3)	0.854	0.661	0.274-1.597	0.355
	Secondary, Tertiary	67 (51.9)	62 (48.1)				
Employment status	**Employed**	30 (56.6)	23 (43.4)	1.278	1.471	0.752-2.875	0.258
	Unemployed	47 (47.0)	53 (53.0)				
Accommodation	**Living alone**	2 (33.3)	4 (66.7)	¥	0.480	0.085-2.702	0.442
	With family	75 (51.0)	72 (49.0)				
Co-morbid physical illness	**No**	61 (48.0)	66 (52.0)	1.575	0.578	0.244-1.370	0.209
	Yes	16 (61.5)	10 (38.5)				
Number of admissions	**0-4**	53 (54.1)	45 (45.9)	1.538	1.521	0.783-2.957	0.215
	>4	24 (43.6)	31 (56.4)				
Duration of illness	**12 years and below**	53 (57.0)	40 (43.0)	4.211	1.988	1.027-3.844	0.040*
	>12 years	24 (40.0)	36 (60.0)				
Duration of ACT	**Less than 20 months**	15 (56.7)	39 (43.3)	3.514	1.861	0.969-3.573	0.061
	≥20 months	26 (41.3)	37 (58.7)				

Abbreviation: BARS= Brief Adherence Rating Scale, OR= Odds ratio, CI= Confidence interval

Median BARS score=90

**Significance level: p<0.05*

¥Fisher's Exact Test

Table 4.4.11, continued

Variable (N=153)		BARS≥90 N (%)	BARS<90 N (%)	Chi²	OR	95% CI	P-value
Age of onset	**28 years and below**	39 (48.8)	41 (51.3)	0.167	0.876	0.464-1.653	0.683
	>28 years	38 (52.1)	35 (47.9)				
Oral atypical antipsychotic	**Yes**	69 (50.7)	67 (49.3)	0.082	1.159	0.422-3.181	0.775
	No	8 (47.1)	9 (52.9)				
Concomitant depot	**Yes**	37 (41.4)	53 (58.9)	7.426	0.401	0.207-0.779	0.006*
	No	40 (63.5)	23 (36.5)				
Atypical antipsychotic type							
Clozapine	**Yes**	6 (50.0)	6 (50.0)	0.001	0.986	0.303-3.205	0.981
	No	71 (50.4)	70 (49.6)				
Olanzapine	**Yes**	14 (51.9)	13 (48.1)	0.031	1.077	0.469-2.474	0.861
	No	63 (50.0)	63 (50.0)				
Quetiapine	**Yes**	4 (57.1)	3 (42.9)	¥	1.333	0.288-6.168	1.000
	No	73 (50.0)	73 (50.0)				
Amisulpride	**Yes**	4 (40.0)	6 (60.0)	¥	0.639	0.173-2.362	0.533
	No	73 (51.0)	70 (49.0)				
Aripiprazole	**Yes**	12 (70.6)	5 (29.4)	3.141	2.622	0.876-7.846	0.076
	No	65 (47.8)	71 (52.2)				
Risperidone	**Yes**	29 (46.0)	34 (54.0)	0.790	0.746	0.391-1.423	0.374
	No	48 (53.3)	42 (46.7)				

Abbreviation: BARS= Brief Adherence Rating Scale, OR= Odds ratio, CI= Confidence interval; Median BARS score=90

***Significance level: p<0.05; ¥Fisher's Exact Test*

Indian patients and those who practise Hinduism are more likely to achieve an oral antipsychotic adherence rate of 90% and above with odds ratio of 3.323, p=0.037 and odds ratio of 4.056, p=0.027 respectively. Chinese patients and devotees of Buddhism are less likely to achieve 90% medication adherence with odds ratio of 0.457, p=0.023 and odds ratio 0.531, p=0.025 respectively. Those who have been ill for less than 12 years have a significant compliance rate of 90% and more (odds ratio 1.988, p=0.040). Patients on depot antipsychotics have lower odds of 90% oral medication adherence (odds ratio 0.401, p=0.006). Patients receiving ACT for less than 20 months appear to be more adherent though the result is not statistically significant (p=0.061).

The different types of atypical oral antipsychotics have no significant effect on level of adherence. Adherence is also not affected by differences in age, gender, marital status, level of education and employment status.

4.5: MULTIVARIATE ANALYSIS OF RELIGIOSITY, RELIGIOUS COPING, SPIRITUALITY, INSIGHT AND ADHERENCE ACCORDING TO THE DIFFERENT RELIGIONS.

Logistic regression was used in the multivariate analysis. Significant variables from the univariate analysis were adjusted for in the multivariate analysis. Other clinically significant variables identified from the literature review were analysed as well although they may not have been statistically significant in the univariate analysis.

Table 4.5.1: Multivariate analysis of DUREL according to different religions using logistic regression.

ISLAM	N (%)	OR	Adj OR	95% CI	P-value
ORA ≥4	50 (59.5)	1.912	2.056	1.053-4.914	0.035*
ORA <4	34 (40.5)				
NORA ≥5	48 (57.1)	1.634	1.962	0.993-3.876	0.025*
NORA <5	36 (42.9)				
IR ≥12	50 (59.5)	1.514	1.787	0.906-3.527	0.094
IR <12	34 (40.5)				
DUREL TOTAL ≥21	50 (59.5)	1.803	2.176	1.097-4.317	0.026*
DUREL TOTAL <21	34 (40.5)				

HINDUISM	N (%)	OR	Adj OR	95% CI	P-value
ORA ≥4	11 (78.6)	3.720	4.936	1.278-19.058	0.021*
ORA <4	3 (21.4)				
NORA ≥5	12 (85.7)	6.448	7.050	1.456-34.141	0.015*
NORA <5	2 (14.3)				
IR ≥12	12 (85.7)	5.583	6.408	1.327-30.937	0.021*
IR <12	2 (14.3)				
DUREL TOTAL ≥21	12 (85.7)	6.087	6.716	1.389-32.473	0.018*
DUREL TOTAL <21	2 (14.3)				

Abbreviation: ORA= Organisational Religious Activity NORA= Non-organisational Religious Activity, IR= Intrinsic Religiosity, OR= Odds Ratio, Adj OR= Adjusted Odds Ratio, CI= Confidence Interval

**Significance level: p<0.05*

***Adjusted for employment, marital status and depot antipsychotics*

Table 4.5.1, continued

BUDDHISM	N (%)	OR	Adj OR	95% CI	P-value
ORA ≥4	17 (35.4)	0.366	0.294	0.137-0.630	0.002*****
ORA <4	31 (64.6)				
NORA ≥5	18 (37.5)	0.433	0.344	0.162-0.731	0.006*****
NORA <5	30 (62.5)				
IR ≥12	20 (41.7)	0.458	0.357	0.169-0.757	0.007*****
IR <12	28 (58.3)				
DUREL TOTAL ≥21	17 (35.4)	0.351	0.271	0.126-0.586	0.001*****
DUREL TOTAL <21	31 (64.6)				

CHRISTIANITY	N (%)	OR	Adj OR	95% CI	P-value
ORA ≥4	2 (28.6)	0.349	0.326	0.060-1.787	0.197
ORA <4	5 (71.4)				
NORA ≥5	1 (14.3)	0.145	0.133	0.015-1.194	0.072
NORA <5	6 (85.7)				
IR ≥12	2 (28.6)	0.312	0.298	0.053-1.687	0.171
IR <12	5 (71.4)				
DUREL TOTAL ≥21	2 (28.6)	0.339	0.320	0.057-1.803	0.196
DUREL TOTAL <21	5 (71.4)				

Abbreviation: ORA= Organisational Religious Activity NORA= Non-organisational Religious Activity, IR= Intrinsic Religiosity, OR= Odds Ratio, Adj OR= Adjusted Odds Ratio, CI= Confidence Interval

***Significance level: p<0.05*

****Adjusted for employment, marital status and depot antipsychotics*

Logistic regression shows that after controlling for employment, marital status and depot antipsychotics, Muslim and Hindu patients have significantly greater participation in organisational ($p=0.035$ and $p=0.021$ respectively) and non-organisational ($p=0.025$ and $p=0.015$ respectively) religious activities while the Buddhists have significantly lower participation in similar activities ($p=0.002$ and $p=0.006$ respectively). Hindu patients also have significantly greater level of intrinsic religiosity ($p=0.021$) while Buddhist patients have significantly lower levels ($p=0.007$). Overall, Muslim and Hindu patients are significantly more religious than the Buddhists ($p<0.05$). Christianity was not significantly associated with religiosity scores.

Table 4.5.2: Multivariate analysis of Brief RCOPE according to different religions using logistic regression.

ISLAM	N (%)	OR	Adj OR	95% CI	P-value
PCOPE ≥21	43 (51.2)	1.966	2.128	1.060-4.275	0.034*****
PCOPE <21	41 (48.8)				
NCOPE >8	33 (39.3)	0.841	0.713	0.358-1.416	0.334
NCOPE ≤8	51 (60.7)				
HINDUISM	**N (%)**	**OR**	**Adj OR**	**95% CI**	**P-value**
PCOPE ≥21	9 (64.3)	2.514	3.833	1.110-13.243	0.034*****
PCOPE <21	5 (35.7)				
NCOPE >8	4 (28.6)	0.542	0.534	0.149-1.915	0.336
NCOPE ≤8	10 (71.4)				
BUDDHISM	**N (%)**	**OR**	**Adj OR**	**95% CI**	**P-value**
PCOPE ≥21	14 (29.2)	0.404	0.315	0.142-0.698	0.004*****
PCOPE <21	34 (70.8)				
NCOPE >8	24 (50.0)	1.692	2.087	0.990-4.399	0.035*****
NCOPE ≤8	24 (50.0)				
CHRISTIANITY	**N (%)**	**OR**	**Adj OR**	**95% CI**	**P-value**
PCOPE ≥21	1 (14.3)	0.202	0.196	0.022-1.752	0.145
PCOPE <21	6 (85.7)				
NCOPE >8	2 (28.6)	0.557	0.543	0.094-3.132	0.494
NCOPE ≤8	5 (71.4)				

Abbreviation: PCOPE= Positive Religious Coping, NCOPE= Negative Religious Coping, Adj OR= Adjusted Odds Ratio, CI= Confidence Interval

***Significance level: p<0.05; **Adjusted for employment, marital status and depot antipsychotics*

Patients practising Islam and Hinduism have significant positive religious coping (p=0.034) while Buddhist patients have significant negative religious coping (p=0.035).

Table 4.5.3: Multivariate analysis of SWB according to different religions using logistic regression.

ISLAM	N (%)	OR	Adj OR	95% CI	P-value
RWB ≥50	38 (51.4)	0.955	1.190	0.525-2.699	0.677
RWB <50	36 (48.6)				
EWB ≥47	40 (54.1)	1.592	1.904	0.841-4.307	0.122
EWB <47	34 (45.9)				
TOTAL SWB ≥98	38 (51.4)	1.167	1.473	0.648-3.348	0.356
TOTAL SWB <98	36 (48.6)				
HINDUISM	**N (%)**	**OR**	**Adj OR**	**95% CI**	**P-value**
RWB ≥50	7 (87.5)	7.269	6.915	0.792-60.347	0.080
RWB <50	1 (12.5)				
EWB ≥47	5 (62.5)	1.731	1.556	0.341-7.107	0.569
EWB <47	3 (37.5)				
TOTAL SWB ≥98	7 (87.5)	7.840	7.455	0.857-64.825	0.069
TOTAL SWB <98	1 (12.5)				
BUDDHISM	**N (%)**	**OR**	**Adj OR**	**95% CI**	**P-value**
RWB ≥50	14 (48.3)	0.830	0.719	0.297-1.742	0.465
RWB <50	15 (51.7)				
EWB ≥47	12 (41.4)	0.627	0.574	0.239-1.378	0.214
EWB <47	17 (58.6)				
TOTAL SWB ≥98	12 (41.4)	0.627	0.536	0.219-1.313	0.172
TOTAL SWB <98	17 (58.6)				

Abbreviation: RWB= Religious Well-Being, EWB= Existential Well-Being, SWB= Spiritual Well-Being, *OR= Odds Ratio Adj OR= Adjusted Odds Ratio, CI= Confidence Interval*

***Significance level: p<0.05; ****Adjusted for employment, marital status and depot antipsychotics*

There are no significant associations between the different religious denominations (irrespective of ethnicity) with religious, existential and total spiritual well-being.

Table 4.5.4: Multivariate analysis of SUMD according to different religions using logistic regression.

ISLAM	N (%)	OR	Adj OR	95% CI	P-value
SUMD ≤15	47 (56.0)	1.308	1.491	0.764-2.910	0.241
SUMD >15	37 (44.0)				

HINDUISM	N (%)	OR	Adj OR	95% CI	P-value
SUMD ≤15	11 (78.6)	3.614	4.055	1.037-15.862	0.044*****
SUMD >15	3 (21.4)				

BUDDHISM	N (%)	OR	Adj OR	95% CI	P-value
SUMD ≤15	21 (43.8)	0.583	0.471	0.226-0.977	0.043*****
SUMD >15	27 (56.3)				

CHRISTIANITY	N (%)	OR	Adj OR	95% CI	P-value
SUMD ≤15	2 (28.6)	0.039	0.368	0.065-2.077	0.258
SUMD >15	5 (71.4)				

Abbreviation: SUMD= Scale to assess Unawareness of Mental Disorder, *OR= Odds Ratio, Adj OR= Adjusted Odds Ratio, CI= Confidence Interval*

***Significance level: p<0.05*

****Adjusted for depot antipsychotics*

Logistic regression shows that after adjusting for depot antipsychotics, Hindu patients have better insight with an adjusted odds ratio of 4.055, p=0.044 while Buddhist patients have poorer insight with an adjusted odds ratio of 0.471, p=0.043.

Table 4.5.5: Multivariate analysis of BARS according to different religions using logistic regression.

ISLAM	N (%)	OR	Adj OR	95% CI	P-value
BARS ≥90	45 (53.6)	1.334	1.541	0.769-3.088	0.914
BARS <90	39 (46.4)				

HINDUISM	N (%)	OR	Adj OR	95% CI	P-value
BARS ≥90	11 (78.6)	4.056	4.275	1.052-17.369	0.042*****
BARS <90	3 (21.4)				

BUDDHISM	N (%)	OR	Adj OR	95% CI	P-value
BARS ≥90	19 (39.6)	0.531	0.446	0.213-0.935	0.032*****
BARS <90	29 (60.4)				

CHRISTIANITY	N (%)	OR	Adj OR	95% CI	P-value
BARS ≥90	2 (28.6)	0.379	0.461	0.082-2.597	0.380
BARS <90	5 (71.4)				

Abbreviation: BARS= Brief Adherence Rating Scale, OR= Odds Ratio, Adj OR= Adjusted Odds Ratio, CI= Confidence Interval

***Significance level: p<0.05*

****Adjusted for duration of illness and depot antipsychotics*

After adjusting for duration of illness and depot antipsychotics, devotees of Hinduism still had 90% or more medication adherence (adjusted odds ratio 4.275, p=0.042) while Buddhist patients were less likely to achieve 90% medication adherence (adjusted odds ratio 0.446, p=0.032). Muslim patients are also likely to achieve a 90% adherence rate but it is not statistically significant (p=0.914).

4.6: CORRELATION BETWEEN DEPENDENT MEASURES AND INDEPENDENT MEASURES

Table 4.6.1: Correlation between religiosity (DUREL), spirituality (SWBS), positive religious coping (PCOPE) and negative religious coping (NCOPE) with oral medication adherence (BARS) using Spearman's correlation co-efficient.

		DUREL	SWBS	PCOPE	NCOPE
Adherence (BARS)	**Correlation Co-efficient, *r***	0.710	0.615	0.736	-0.659
	P-value	<0.001*	<0.001*	<0.001*	<0.001*

significance level, p<0.05

There is a significant correlation between measures of religiosity, spirituality and religious coping with the primary outcome measure of medication adherence (p<0.001). There is a high correlation between medication adherence and religious commitment (*r*=0.710), spiritual well-being (*r*=0.615) and positive religious coping (*r*=0.736). Negative religious coping is inversely correlated with oral medication adherence (*r*= -0.659).

Table 4.6.2: Correlation between religiosity (DUREL), spirituality (SWBS), positive religious coping (PCOPE) and negative religious coping (NCOPE) with insight (SUMD) using Spearman's correlation co-efficient.

		DUREL	SWBS	PCOPE	NCOPE
Insight (SUMD)	**Correlation Co-efficient, *r***	-0.774	-0.701	-0.781	0.748
	P-value	<0.001*	<0.001*	<0.001*	<0.001*

significance level, p<0.05

There is a significant high inverse correlation between measures of religiosity (*r*= -0.774, p<0.001), spirituality (*r*= -0.701, p<0.001) and positive religious coping (*r*= -0.781, p<0.001) with the secondary outcome measure of insight. There is also a high positive correlation between negative religious coping and insight (r= 0.748, p<0.001) implying that as the scores of negative coping increase, SUMD scores also increase indicating poorer insight levels.

CHAPTER 5

DISCUSSION

This is a cross-sectional study examining the prevalence of religiosity, spirituality and religious coping as well as the associated socio-demographic and clinical factors amongst schizophrenia patients receiving assertive community treatment. The study also attempts to draw an association between religiosity measures and spirituality with oral antipsychotic medication adherence and insight.

5.1 Socio-demographic and clinical characteristics of study patients

Participants were recruited from the home-care zones covered by the Community Psychiatry team in Hospital Bahagia Ulu Kinta. The characteristics of the patients mirror the general picture of schizophrenic patients registered at the national level. 63.4% of patients are male while the remaining are females. This is comparable to the data presented in the National Mental Health Registry Report (NMHR) 2005 whereby the majority of schizophrenic patients were male (62%), with a ratio of 2:1. This may be due to the clinical presentation of male patients who usually present with aggressive behaviour resulting in

an over-representation of the male gender although epidemiological studies show no risk difference between the two genders (Hafner, 1997).

The ethnic composition of the study population is similar to that described in the Mental Health Registry. 54.9% are Malays, 34.6% are Chinese while the remaining 10.5% are Indians. This is also representative of the ethnic composition of the patients enrolled in the assertive community treatment programme of Hospital Bahagia. Likewise, 54.9% are Muslims, 31.4 % Buddhist, 9.2% Hindu and 4.6% are Christians. The patients in this study were older with a mean age of 40.47 years compared to 33.1 years (age at first contact with psychiatric services) described in the registry. The average age of onset of schizophrenia in this study population is 28.44 years, which is marginally lower compared to the age of onset of 30 years in the NMHR report. This is consistent with global schizophrenia statistics whereby onset after age of forty is rare (Jablensky, 2000; Hafner, 1997).

The study patients are also more educated as 84.3% attained secondary level of education and above. This difference in education level is probably because the majority of patients in community care live in semi-urban and urban areas while the national registry comprises of patients who live in rural areas also. Only 26.1% of patients were married which is similar to the 23% described in the registry.

The unemployment rate is 65.4%, which is lower compared to 68% at the national level. Besides the impairments caused by the illness, the majority of patients in this study are unable to work citing reasons such as the inability to secure jobs in the mainstream

market (Aziz et al, 2004), stigma, inadequate salaries offered by employers and lack of transportation to the workplace.

The patients in this study have a slightly higher rate of co-morbid physical illness as 17% of them have a medical disorder compared to 10% of the patients in the national registry. This may be due to the average older age of patients recruited for this study as well as the greater usage of atypical antipsychotic agents.

88.9% of patients receive second-generation oral antipsychotics compared to only 34% reported in the National Mental Health Registry in 2005. This difference may be due to the increased availability of atypical antipsychotics coupled with the development of generic medication. Amongst the various atypical antipsychotics used, the majority of patients (40.5%) receive risperidone probably due to its availability in the generic form and at a lower cost. More than half (58.8%) of the patients are on depot injections with the chief reason being unsatisfactory oral medication adherence.

5.2 Prevalence of religiosity, spirituality and religious coping

Based on measurement with the DUREL, the mean religious commitment level obtained from this study is 16.93 (SD=7.3). This is marginally higher than a previous study done by Mela et al (2008) amongst a Canadian psychiatric population with a mean DUREL of 16 (SD=6) but lower compared to a study done in Malaysia which revealed a mean DUREL score of 20.52 (SD 5.40) (Nurasikin, Khatijah, Aini, Ramli, Aida, Zainal, Ng, 2012). The median DUREL obtained in this study however is 21 with 52.9% of patients scoring above or equal to the median score. This indicates that religion is central in the lives of 52.9% of the population, which is higher compared to two other studies with a prevalence of 45% (Mohr et al, 2007) and 46% (Mohr, 2011). There are a few possible reasons for this difference. The Malaysian population is multiracial and the three main races namely the Malays, Chinese and Indians invariably practise Islam, Buddhism and Hinduism respectively, with a minority of Chinese and Indians also practicing Islam and Christianity. Religion is deeply ingrained within these three races so much so that almost every family unit has religious beliefs. The fact that 52.9% of patients with schizophrenia concur that religion is central in their lives can be due to their own personal belief or it may be due to the influence and encouragement of family members as 96.1% of them live with their families.

Both the mean and median score for organisational religious activity (ORA) practised by the study population indicate that the majority of patients attend worship a few times every month which is slightly lower than the study done by Mela et al (2008) which indicates that patients attend worship on a daily basis. This difference is largely due

to the diverse religions sampled in this study. Every religion has its norms when it concerns frequency of attendance at places of worship. Even within the same religion, for example Islam, the frequency of attendance at the mosque is different for males and females. Males are required to attend worship in a mosque at least once a week on Fridays while females are only encouraged to attend prayers on special occasions. Another reason could be that worship centres such as mosques, temples and churches are located far away from where patients live, a problem which is compounded by the lack of private and public transportation. In the study by Mela et al (2008), places of worship were readily accessible and available. The mean ORA score of 3.82 (SD 1.55) in this study is however similar to the mean ORA score of 3.78 (SD 1.70) in the study by Nurasikin et al (2012).

51.6% of the study patients spend time in private religious activities such as praying, meditating or reading holy books on a daily basis which is higher than the 44.7% in the study done by Mela et al (2008). This is because the different religions in this study have specific requirements pertaining to the frequency of private religious activities. For example, one of the five pillars of Islam requires Muslims to pray five times a day (Okasha, 2010) while the Hindus and Buddhists pray at least once or twice a day. Therefore, this discrepancy can be attributed to the fact that Muslims in this study represent 54.9% of the study sample. The mean NORA score of 4.47 (SD 1.90) is similar to the mean NORA score of 4.07 (SD 1.89) in the study done by Nurasikin et al (2012).

The mean score for intrinsic religiosity (IR) is 10.94 (SD 3.42) which is lower compared to 12.68 (SD 3.06) in the study done by Nurasikin et al (2012). However, the median IR score in this study is 12 with 54.9% of patients having a high degree of personal religious commitment and motivation.

The Brief RCOPE was used to assess religious coping. The mean score for positive religious coping (PCOPE) is 19.28 (SD 5.15) which is marginally lower compared to the mean PCOPE of 21.18 (SD 5.53) in the study by Nurasikin et al (2012). Nevertheless, the median PCOPE score for this study is 21.00 indicating that 50.8% of patients use religion to cope positively with their illness, which is lower than the 60% found in the study by Mohr et al (2007). The difference in prevalence of positive religious coping may be due to the fact that in the study by Mohr et al (2007), Christianity was the predominant religion accounting for 61% while Islam and Buddhism made up less than 13% of the study sample. The extent of the effect of positive religious coping may differ according to the different ethnic groups and religions (Bhui K, King M, Dein S, O'connor W, 2008). The mean NCOPE score for this study is 8.41 (SD 2.15) which is lower than in the study done by Nurasikin et al (2012) which found a mean NCOPE score of 11.66 (SD 4.80). Higher scores on the NCOPE indicate negative religious coping. In this study, it could be said that half of the patients utilised their religious beliefs to cope positively with their illness while the other half did not find religion to be a beneficial coping strategy.

Spirituality was assessed using Ellison's Spiritual Well-Being Scale. The mean score for religious well-being (RWB) is 43.00 (SD 15.91) which is similar to the study done by

Mela et al (2008) which yielded a mean score of 42.50 (SD 10.00). The median RWB score in this study is 50 indicating high religious well-being. The mean score for existential well-being (EWB) is 43.44 (SD 10.97) which is also similar to the mean score of 42.60 (SD 10.00) (Mela et al, 2008). The median score for EWB is 47.00 indicating moderate existential well-being. The mean total spiritual well-being (SWB) score is 86.44 (SD 26.34) which corresponds to the mean SWB score of 85.10 (Mela et al, 2008) indicating an overall moderate degree of spiritual well being. The median SWB score is 98 (range 20-120) wherein 50% of patients regard spirituality as important in their lives, which falls within the range of 85-108 found amongst religious group members (Ellison, 1983).

5.3: Comparison between the different religions with regards to religiosity, spirituality and religious coping and the associated socio-demographic and clinical characteristics.

Studies have found significant positive associations between religious participation and social support (Ellison & George, 1994; Koenig, Hays, George, Blazer, Larson, Landerman, 1997). Likewise, Koenig and Larson (2001) in a systematic review of 35 studies found that those who are religious have stable and happy marriages. This finding has been replicated in our study whereby patients who are married have significantly better religious well-being than those who are single. Unmarried patients were also found to have significant negative religious coping.

In this study, employment was found to be significantly associated with religious commitment and religious coping. One of the aims of community care is to enable patients to gain employment through its supported employment programme. 34.6% of patients who participated in this study are employed. Work not only provides a source of stable income, it also broadens social contacts, enhances identity and socio-economic status, thus improving the quality of life of people with serious mental illnesses. If mentally ill patients are given adequate support, 58% of them should succeed in obtaining competitive employment (Bond, Drake, Mueser, 1997). Religiosity has been found to be directly associated with economic growth and entrepreneurship (Galbraith & Galbraith, 2007) and is one of the telling factors contributing to how people progress through their careers (Ismail & Rasdi, 2005). Gainful employment lessens the economic burden for patients and their families and allows them to cope positively with their illness. In Hinduism, work is one

of the four different paths through which a person can achieve spiritual enlightenment (Tarakeshwar et al, 2003). Borras et al (2007) failed to demonstrate a relationship between religiosity and socio-demographic characteristics.

The three main religions sampled in this study are Islam, Buddhism and Hinduism, typically reflective of the religious diversity of Malaysia. After having controlled for socio-demographic factors such as employment and marital status, Muslim and Hindu patients were found to be more religious and to have positive religious coping compared to Buddhist patients. Hindu patients are also more spiritual than the non-Hindus.

Muslims attribute all life events to the will of God and when faced with a multitude of problems, religious coping stands out as a vital method of adjustment (Okasha, 2010). The five pillars of Islam are the basic obligations of a Muslim whereby the second pillar requires a Muslim to pray five times a day as a way of strengthening their faith (Carolan, Bagherinia, Juhari, Himelright, Mouton-Sanders, 2000). According to Haque (1998), Islam and mental health complement each other as both seek to better humankind personally and existentially. Islam is an advocator of life preservation and thus prohibits suicide and self-harm. Due to sound religious coping, suicidal acts are less common in Muslims, giving credence to the fact that Islam acts as a buffer against mental distress (Okasha, 2010). To further support this finding, the role of family members in providing moral and emotional support cannot be overstated as Islam instils pride in the family-care of mentally ill patients (Okasha, 2010). This enables patients to freely express and practise their religion as well as prevents against negative coping methods.

The emphasis of mental health in Hinduism is clearly depicted in five areas. The first is that spirituality is a core element of Hinduism. The second is the acknowledgement that the body and mind are united. Third is the contribution of yoga and meditation as techniques to overcome mental distress. The fourth is the description of psychological interventions in the *Bhagavadgita* and the fifth is the four stages of life known as *ashramas* that offer a guide for a person's life-course (Murthy, 2010). Hindu scripture encourages its believers to begin every day with meditation and morning prayers. Hindus believe in the law of *Karma* or reincarnation whereby the soul is thought to be reincarnated through cycles of birth and re-birth before it can be purified to attain a state of *nirvana* (heaven). *Karma* will ensure that a person is reborn into a life befitting his/her past actions in life. Therefore, to circumvent the bad Karma, Hindus are encouraged to follow the path of righteousness or *Dharma* (Juthani, 2001). This could be the reason why Hindu patients with schizophrenia find solace in their religion and use it positively to cope with their illness. In addition to this, there are four paths via which adherents of Hinduism are able to attain spiritual enlightenment; knowledge, employment or work, devotion and psycho-spiritual exercises or meditation (Tarakeshwar, Stanton & Pargament, 2003).

Buddhist patients were found to have significantly lower religious commitment, spirituality and to adopt negative religious coping. Although 70% of Malaysian Chinese are Buddhists, other religions such as Taoism and Confucianism are simultaneously embraced according to the different stages of their lives (Lee and Heng, 2000). Groth-Marnat (1992) observed that Buddhists seek spiritual liberation through meditation and companionship with others rather than pursuing a loving relationship with God (as cited by Huang, Appel, Ai & Lin,

2012). The most reasonable explanation for this finding may lie in the observation that factors associated with religiosity and spirituality amongst the Chinese are part of their cultural identity. For example, while the Malays are strictly adherent and loyal to Islam, the Chinese appear to be more open and free-spirited (Idris, 2008). Purcell (1948) observed that the Chinese have a more flexible attitude towards various aspects of life such as clothing, food and religion (as cited by Idris, 2008). The Chinese are noted to be ambitious, materialistic and meritocratic (Abdullah, 1992) and these values seem to be in contrast to the more traditional Confucian values held by the Chinese in mainland China such as propriety, people-centeredness and contentment (Idris, 2008). When these ideals are not achieved because of mental illness, compensatory measures in the form of negative coping are adopted.

This is illustrated by the five phases in which Chinese families cope with having a relative who is mentally ill (Lin, 1983). Phase 1 involves intrafamilial coping involving a variety of remedial measures extensively utilising resources of the family. Phase 2 is when help from friends and community members are sought to deal with the 'abnormal behaviour'. In phase 3, a physician or religious healer is consulted to treat the psychotic individual who continues to remain in the family. Phase 4 is reached when finally the sick member is diagnosed as having a mental illness. The family now feels that they have reached their limit of tolerance in dealing with the mentally ill member who has exhausted all their financial resources. This is when the final phase of rejection sets in. The family loses hope and blames evil spirits or bad *feng-sui* (geomancy) for their fate of having to deal with a mentally ill relative in their midst. With the evidence before this emphasizing the

importance of family support for the mentally ill, it is not difficult to imagine how this negative coping can influence a patient with schizophrenia causing them to also adopt similar negative coping strategies.

5.4: Assessment of insight

Poor insight is prevalent in schizophrenia and usually leads to medication non-adherence. In this study, the Scale to assess Unawareness of Mental Disorder (SUMD) was used to measure insight. The scale contains nine items with each item producing a score of 0 to 5. The mean total score was 17.93 (SD 7.354) with higher scores predicting poorer insight. This scale contains three general items that form the core definition of insight; awareness of mental disorder (SUMD Item 1), awareness of achieved effects of medication (SUMD Item 2) and awareness of social consequences of having a mental disorder (SUMD Item 3). In this study, the mean for SUMD Item 1, SUMD Item 2 and SUMD Item 3 were 1.54 SD=0.866, 1.74 SD=0.979 and 2.04 SD=1.044 respectively. The mean scores of these three core items were better compared to studies by Arduini et al (2003) (Item 1, mean 2.12 SD=0.83; Item 2, mean 1.76 SD=0.88; Item 3, mean 2.12 SD=0.86), Braw et al (2011) (Item 1, mean 2.2 SD=1.4; Item 2, mean 2.0 SD=1.4; Item 3, mean 2.8 SD=1.5) and Pini et al (2003) (Item 1, mean 3.53 SD=1.47; Item 2, mean 3.64 SD=1.35; Item 3, mean 3.61 SD=1.41). 71.2% of patients in this study clearly felt they had a mental disorder, 62.1% acknowledged the beneficial effects of taking medication and 52.9% were aware of the social consequences of having a mental illness. This is far better than the 80% of patients who had poor awareness

of the social consequences and 70% of patients who had poor awareness of having a mental disorder and the effects of medication in a study by Choudhury et al (2009).

This study found that religious beliefs have an effect on the level of insight amongst schizophrenic patients. Adherents of Hinduism were noted to have significantly better insight compared to Buddhist patients. This is in contrast to the study done by Ainsah, Nurulwafa & Osman (2008) who did not find any significant differences between the levels of insight of Malay, Chinese and Indian schizophrenic patients. The probable explanation for the difference in results between these two studies is that in the study by Ainsah et al (2008), insight was assessed using the single item of 'insight and judgement' of the PANSS scale giving rise to a single score ranging from 1 to 7. Although the core elements of insight (awareness of mental disorder, the need for medication and social consequences of mental illness) are incorporated into this item of the PANSS, it is inferior compared to the SUMD which is able to assess these three components independently, thereby producing an accurate assessment of insight.

Hindu patients in this study have better insight because of their willingness to accept that they are mentally ill and are more aware of the benefits of taking antipsychotic medication. The positive role played by family members also has an affirmative effect on the level of insight. Chinese patients and the adherents of Buddhism were found to have poor insight. This finding is corroborated by results obtained in other studies assessing insight in Chinese schizophrenic patients (Wang et al, 2011; Xiang et al, 2012). This could be due to the fact

that Chinese patients tend to blame evil spirits and bad geomancy for their illness and the relatively inferior support offered by family members as explained previously.

Another significant finding in this study is that patients on depot antipsychotics have poorer insight compared to those receiving oral medication alone. This is confirmed by a study done by Mahadun & Marshal (2008).

5.5: Assessment of medication adherence

Antipsychotic medication adherence was assessed using the Brief Adherence Rating Scale (BARS). The mean adherence rate is 75.56%, indicative of partial adherence. However, the median adherence rate is 90%. 56.9% of patients achieved full adherence (80-100%), 35.9% are partially adherent (50-70%) while 7.2% are poorly adherent (0-40%). This is far better than the estimation made by Oehl et al (2000) that only one-third of schizophrenic patients were fully adherent, one-third partially adherent and the remaining one-third non-adherent.

Religion was found to be an important predictor of medication adherence in this study. Hindu patients have significantly better medication adherence compared to Buddhist patients. This is due to their greater levels of insight as demonstrated in the previous section. Poor insight is a known predictor of medication non-adherence in schizophrenia (Gharabawi et al, 2006). In a study by Lama et al (2012), Hindu schizophrenic

patients had a relatively good medication adherence rate with 37% achieving good compliance, 50% average compliance while only 13% were poorly compliant.

Patients receiving depot antipsychotics were also found to have poor medication adherence and this is due to poorer insight in this group. Interestingly, illness duration of fewer than 12 years was associated with better medication adherence. Studies have either found that adherent patients have a longer duration of illness (Linden et al, 2001) or have failed to demonstrate a relationship between duration of illness and adherence (Buchanan, 1992). A likely explanation for this difference in findings is that schizophrenia is a chronic illness and as the duration of illness increases, the cognitive deficits worsen. Cognitive deterioration was sufficient to interfere with medication adherence in 50% of patients (Turner et al, 2007).

5.6: Does religiosity, spirituality and religious coping have an influence on medication adherence and insight?

This study has proven that religiosity, spirituality and religious coping are significantly correlated with both medication adherence and insight. Important associations were drawn from this study, the findings of which are illustrated below:

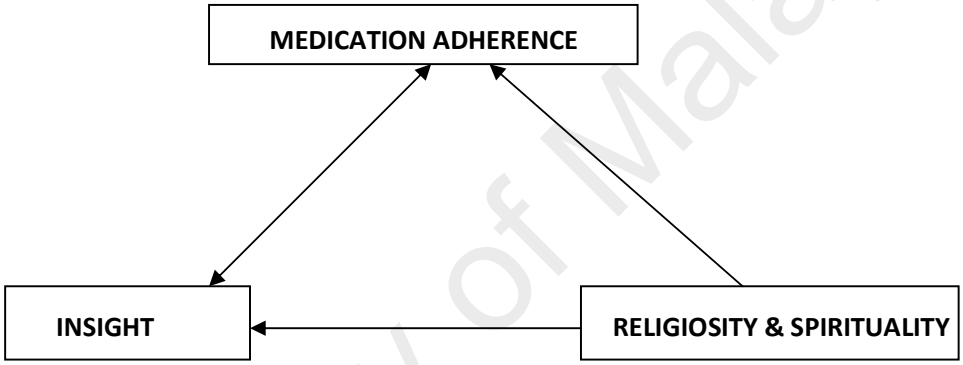


Figure 5.1: Relationship between religiosity, spirituality, insight and medication adherence.

The relationship between insight and medication adherence is beyond doubt and in fact may be bidirectional (Chakraborty & Basu, 2010). Methods to improve insight such as compliance therapy (Kemp & David, 1996) and cognitive behavioural therapy (Rathod et al, 2005) have been described in detail. This study has proven that there is a significant correlation between religiosity, spirituality and medication adherence. The evidence is in support of studies done elsewhere around the world justifying the positive impact of religion and spirituality on medication adherence (Huguelet et al, 1997; Kirov et al, 1998; Mohr et al, 2006). To further substantiate this evidence, this study also established a

significant link between religiosity, spirituality and insight. Kirov et al (1998) similarly found that patients who are religious and used it to cope had greater insight into their illness.

CHAPTER 6

LIMITATIONS

Several limitations have been identified throughout this study. Since the design is cross-sectional, the relationship between religiosity and spirituality with medication adherence and insight cannot be seen as an index of causality. Spirituality and religiosity can have an impact on psychopathology in the sense that positive psychotic symptoms may result in the development of pathological religious beliefs while negative symptoms may restrict spiritual growth. In this study, the assessment of psychopathology was done to screen for stable patients in order to minimize the recruitment of patients with pathological religious beliefs and to allow for a more reliable assessment of insight.

The sample size of this study was limited although exceeding the initial target. Ideally, a larger sample size with a higher precision would have been preferred. Due to the small sample size, multivariate analysis may be considered as exploratory.

Only patients who were able to converse in Malay and English were recruited thus excluding a large portion of patients who speak only in Tamil and in various Chinese

dialects therefore limiting the generalization of this study to the whole population of schizophrenia patients receiving ACT from Hospital Bahagia Ulu Kinta.

This study was time consuming as the average duration taken for one patient to complete the assessment was fifty minutes. This only enabled three to four patients to be assessed in a day thus limiting the total number of patients recruited. Thirty-nine patients were unable answer the Spiritual Well-Being Scale completely. Some of the reasons identified are that the questionnaire was too lengthy, patients had difficulty understanding the statements as half were worded in a negative direction and the time taken to answer the questionnaire was too long thereby causing some patients to become exhausted. At times, questions had to be interpreted as some patients possessed limited command of Bahasa Malaysia or English**.**

There may have been a response bias when it came to answering questions about medication adherence as certain patients may have been reluctant to admit to being non-adherent. Some patients did not allow pill counts to be done thereby limiting our rating precision. In cases such as this, family members were relied upon to give an accurate account of the patients' medication-taking habits.

The decision to include patients with concomitant depot antipsychotics was purely because the majority of patients receiving ACT from Hospital Bahagia are on both oral and depot antipsychotics. Patients receiving oral antipsychotics alone would have been insufficient to make up the targeted sample size for this study. Concerns that the inclusion

of patients with depot might have influenced the results of the study were addressed by adjusting for depot antipsychotic medication in the multivariate analysis.

CHAPTER 7

CONCLUSION & RECOMMENDATIONS

This study has shown that religion, spirituality and religious coping are essential elements in the personal and social lives of patients suffering from schizophrenia. Religion is entwined with the various cultures and appears to be 'a way of life' of the local population. Religiosity and spirituality are highly influential in the way patients cope with their illness. The World Health Organisation defines health as a state of complete physical, mental and social well-being and not just the absence of disease or infirmity (WHO, 1948). The WHO Quality of Life (WHOQOL) instrument has six domains that include physical health, psychological health, level of independence, social relationships, environment and spirituality, religion and personal beliefs. In ensuring a state of complete mental well-being, psychiatrists are encouraged to view patients as whole persons; individuals who have physical, emotional, social and spiritual needs.

With the wealth of evidence presented herein coupled with the high prevalence of religiosity, spirituality and religious coping, it is wise that we integrate spirituality (encompassing religiosity) into the bio-psycho-social model of patient care. Eliciting religious and spiritual history should be a routine component of psychiatric assessment if the mental health services in a multicultural society such as in Malaysia is to become more

sensitive to client needs (Cox, 1996). The American College of Psychiatrists Consensus Panel have suggested four questions that shall be put forth to a patient during a clinical interview; (i) Is faith (religion, spirituality) important to you?, (ii) Has faith been important to you at other times in your life?, (iii) Do you have someone to talk to about religious matters?, (iv) Would you like to explore religious or spiritual matters with someone? (D'Souza, 2004). With this, psychiatrists will be able to gain insight whether spiritual/religious interventions will benefit the patient and assist in coping. Psychiatrists should however be mindful as not to 'prescribe' religious beliefs for health purposes and not to impose their own religious and spiritual beliefs onto their patients. It is best to elicit help from religious professionals in providing religious counselling to patients (D'Souza & Kuruvilla, 2006). This is indeed an opportunity for psychiatrists to collaborate with religious professionals in aiding mentally ill patients on their journey to recovery.

Religion and spirituality have proven to be the common mediator for both insight and medication adherence. Antipsychotic medication adherence has been recognised as a major obstacle in the recovery and rehabilitation of patients with schizophrenia. Among the many strategies proposed to improve medication adherence (Mitchell & Selmes, 2007), religiosity and spirituality are more than worthy to be added to this list.

Assertive Community Treatment teams assess patients' needs using the Camberwell Assessment of Needs Short Appraisal Schedule (CANSAS) of which spirituality is a need that must be met. Addressing religious and spiritual issues will not only assist in improving treatment adherence and insight, it will also help improve the doctor-patient-family

therapeutic relationship, which is essential in ensuring continuity of treatment. In our society where mental illness is generally a taboo and religion is a sensitive issue, negotiating a common understanding of how both religion and psychiatry complement each other may allow us to successfully engage patients in treatment.

Studies such as this will benefit from qualitative research. Therefore, a prospective or longitudinal study assessing the stability of religiosity, spirituality and religious coping over time with medication adherence and insight will be able to offer us more in-depth proof of the mere association obtained in this study. It would also be interesting to see how religion influences psychopathology and vice versa.

God of Hope, fill us with joy and peace as we trust in You.

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