South Asian Immigrants' Mental Health

and Use of Health Services

BY

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DISSERTATION

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This dissertation is dedicated to my parents who have shared my dream and supported me in all my endeavors. It is also dedicated to my four year old son, Satej who has been a constant source of hope and inspiration for me.

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LIST OF ABBREVIATIONS

AI   Asian Indian

CMD   Common Mental Disorders

NCS   National Comorbidity Study

NCS-R   National Comorbidity Study – Replication

NLAAS   National Latino and Asian American Study

SA   South Asian

SAALT   South Asian American Leaders of Tomorrow

SAAPRI   South Asian American Policy and Research Institute

SAHDS   South Asian Health Descriptor Study

SAPHA   South Asian Public Health Association

WHO   World Health Organization

SUMMARY

Immigrants from South Asian (SA) countries have been perceived as a *model minority* group that is economically prosperous and well adjusted in the American society. The aim of this study was to understand SA immigrants' mental health problems and use of health services for these problems. First, it was examined whether the mental disorders of depression, anxiety and somatization are represented by a single underlying factor of common mental disorders among SAs. Second, the role of acculturation and social support in predicting these three disorders was examined. Third, the association of the three disorders and other psychosocial factors including acculturation, social support, negative beliefs about mental illnesses, stigma and insurance status with use of general health services in the past three months was studied.

A secondary analysis of data from the South Asian Health Descriptor Study (SAHDS) was conducted for the purpose of this study. The SAHDS was conducted at Chicago based community based agencies that provided health and other social services to SA immigrants. Participants in the SAHDS were interviewed by trained bilingual interviewers using structured questionnaires in English, Hindi or Gujarati. The sample of the current study consisted of the entire sample of SAHDS: 331 immigrants born in a SA country and above age 40. The current study was conducted within an ecological conceptual framework and multivariate techniques of principal components analysis, multiple linear and logistic regression analysis were used to analyze data.

The study results showed that depression, anxiety and somatization were not represented by a single factor of common mental disorders (CMD). A two factor solution revealed one factor with all symptoms of depression (except suicidal ideation), anxiety and

SUMMARY (continued)

five symptoms of somatization and another factor with gastrointenstinal somatic symptoms. This finding partially endorsed the dimensional perspective on CMD and confirmed the importance of somatic symptoms in study of CMD in SAs.

Around one in four participants had mild level of depressive symptom severity and more than one-third had mild level of somatic symptom severity. Only four percent of the participants had used mental health services in the previous year and around half the participants had used general health services in the past three months. The analysis of psychosocial predictors associated with mental health problems showed that among demographic factors, lower adequacy of monetary resources predicted greater severity of symptoms on the three disorders, and more than high school but less than graduate level education predicted lower severity of depression and anxiety symptoms. Among acculturation indicators, fluency in English predicted a lower severity of depression symptoms, stay in the U.S. for more than ten years predicted greater severity of anxiety symptoms and a South Asian cultural identity predicted greater severity of somatization symptoms. A higher sense of social support predicted lower severity of depression and anxiety symptoms.

Among factors associated with general health service use in past three months, the acculturation indicators of English fluency and duration of stay in U.S. had independent effects on use of health services. Participants with higher fluency in English and participants who had stayed in U.S. for more than 10 years were more likely to have used general health services.

SUMMARY (continued)

Insurance status had an overarching effect on use of general health services. Participants with health insurance were more than three times likely to have used general health services. Insurance also moderated the association of depression, anxiety and use of health services. Among participants with and without health insurance depression scores were associated with lower odds of use of general health services and somatization was associated with greater odds of use of general health services.

In conclusion, this study highlights the need to address mental health issues of SA immigrants. It reveals that SAs who face financial difficulties, have not acculturated well to the American society may suffer from greater severity of common mental disorders of depression and anxiety. It also informs that SAs in the U.S. are more likely to seek health services for their somatic symptoms than depressive or anxiety symptoms.

I. INTRODUCTION

South Asians are the fastest growing immigrant group in the U.S.. According to the U.S. census, the number of South Asians living in the U.S. increased from 919,626 in 1990 to 1,893,723 in 2000, a growth of 106% over a period of 10 years. In the year 2000, immigrants from different South Asian (SA) countries included 89% Indians, 8% Pakistanis, 2% Bangladeshis, 1% Sri Lankans and less than 1% Nepalese (South Asian American Leaders of Tomorrow (SAALT), 2007).

Despite the rapid growth of SAs in the U.S., there is limited research on their mental health. Research in this area is needed to provide effective mental health services to the growing SA population. The proposed study aims to examine the relationship between different psychosocial and socio-cultural factors such as acculturation, social support, negative beliefs about mental illnesses, stigma associated with seeking help and availability of health insurance with two mental health related outcomes: the extent of common mental disorders (depression, anxiety and somatization) and utilization of health services for these disorders. This study analyzed data from the "South Asian Health Descriptor Study" (SAHDS) that was conducted through three community-based agencies in Chicago. The SAHDS was a cross sectional study that used a purposive sampling strategy to acquire data from 331 first generation SA immigrants above age 40.

A.   What do we know?

1.   Mental Health of South Asian Immigrants in American Socio-cultural Context

The research on mental health issues of Asians in the U.S. has been guided by two controversial hypotheses. One hypothesis suggests that Asian immigrants are likely to have lower rates of mental disorders because they are an extremely well adjusted "model minority", and because they manifest psychic distress through physical ailments. The

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contrasting hypothesis suggests that rates of mental disorders are likely to be high in Asian immigrants because of the stresses associated with acculturation and immigration. While there is support for both hypotheses (Chang, 2002), important American epidemiological studies show that Asian Americans and Pacific Islanders (AA/PI) have low rates of mental disorders in the same range as Whites; however they are likely to describe themselves with more serious and numerous symptoms (Sue & Chu, 2003).

The dearth of information on mental health of SAs in the U.S. is because information on Asians in U.S. is usually aggregated without due attention to the differences between different subgroups of Asians. Mental health issues of SAs are different from other Asian communities as they form a distinct socio-cultural group. With regard to understanding issues of health and ill health, South Asians have a holistic view such that they perceive a connection between the mind, body and the soul (Durvasula & Mylvaganam, 1994). They also have specific attitudes and beliefs toward mental illnesses. They may have misconceptions such as mental illnesses are incurable (Fazil & Cochrane, 1998 cited by Hussain & Cochrane, 2004), and associate stigma with having mental health problems and seeking treatment for these problems (Greenwood, Hussain, Burns & Raphael, 2000; Raguram, Weiss & Chanabasavanna, 1996).

After immigrating to America SAs have to face several challenges while adapting to the Western culture. Their ethnic identity is challenged in the American socio-cultural context and they experience difficulties because of loss of familial support and lack of cultural continuity (Inman, Howard, Beaumont & Walker, 2007). They may feel vulnerable due to lack of social support, economic uncertainty, loss of social status and a mechanistic lifestyle (Ahmad, Shik, Vanza, Cheung, George & Stewart, 2004). Such difficulties can lead to mental health problems among SA immigrants.

2. Common Mental Disorders

Common mental disorders (CMD) include a "[b]road group of distress states which manifest with a mixture of anxiety and depressive symptoms" (Patel, 1998, p. 4). The term "common mental disorders" is most commonly used to refer to disorders of depression and anxiety, though a range of other related and commonly occurring disorders (e.g. substance dependence) are also sometimes included under this rubric.

Though depression and anxiety have a genetic basis, these disorders mostly start in the presence of social, cultural and psychological stressors (Goldberg & Goodyear, 2005). The association of different socio-economic factors such as education, employment status, income and material standard of living and occupational status with CMD has been examined in research. This research indicates that higher rates of CMD are associated with less privileged social position, lower levels of education and material disadvantage or factors associated with poverty such as poor living conditions (Fryers, Melzer & Jenkins, 2003; Patel & Klienman, 2003). Additionally, women suffer more than men from depression and anxiety (Kessler, Berglund, Demler, Jin, Merikangas & Walters, 2005).

a. Common Mental Disorders in SA Immigrants

The prevalence of CMD among SA immigrants has been reported recently (Masood, Okazaki & Takeuchi, 2009). The twelve month prevalence rate for any affective disorder is 1.2% and any anxiety disorder is 3.3%. Though these rates are lower than the national rates, literature suggests that mental health problems such as depression are considered important by SA immigrants (Rao, 2006). Research on the relationship of acculturation (the process of immigrants' adaptation to a new culture) to psychological distress suggests that SAs are less likely to suffer from depression when they are well acculturated and integrated into the American society (Mehta, 1998; Rahman & Rollock,

2004 ; Thomas & Choi, 2006). Social support could also be associated with lesser mental health problems in SAs (Thomas & Choi; Wright, 2006) and can attenuate the difficulties and mental health problems involved in the process of acculturating to a new society (Lee, Koeske & Sales, 2004; Oppedal, Røysamb & Sam, 2004; Shen & Takeuchi, 2001).

3.   Common Mental Disorders and Somatization

People suffering from anxiety and depressive disorders have both somatic and psychological symptoms. The World Health Organization's collaborative study showed that in several countries and in different cultures correlation of somatic symptoms with depression was 0.40 and with anxiety was 0.33 (Simon, Gater, Kisely & Piccinelli, 1996). Evidence also suggests that symptoms of depression, anxiety and somatization may overlap and that these disorders may be represented by an underlying factor of common mental disorders (Kessler, Chiu, Demler & Walters, 2005; Krueger, 1999; Krueger, Chentsova-Dutton, Markon, Goldberg & Ormel, 2003).

The presentation of CMD is also influenced by cultural factors (Chaturvedi & Bhugra, 2007). South Asians are known to report more somatic symptoms (Minhas & Nizami, 2006). Several explanations have been offered for somatization by SAs: lack of psychological mindedness limits expression of psychological symptoms and increases expression of somatic symptoms (Minhas & Nizami); greater stigma is associated with psychological symptoms than somatic symptoms and so somatic symptoms are reported more (Raguram, Weiss, Channabasavanna & Devins, 1996); people with CMD offer somatic explanations in the early stages of the illness and offer psychological explanations as the illness becomes more severe and chronic (Patel, Pareira & Mann, 1998). SAs immigrants also treat somatic symptoms than psychological symptoms (Karasz, 2005) and expect treatment for somatic symptoms, but not a referral to psychiatric treatment (Bhui, 1999).

4.   Utilization of Health Services by SA Immigrants

Immigrants underutilize mental health services due to cultural and linguistic

barriers (Kirmayer, Weinfeld, Burgos, du Fort, Lasry & Young, 2007; Spencer & Chen,

2004). South Asian immigrants face several socio-cultural barriers to utilization of mental

health services. They may not see a need for mental health services as they understand mental

illnesses differently. In a New York based study SA women acknowledged depression as a

feeling and not as an illness and preferred dealing with it by themselves and by relying on

family and friends (Karasz, 2005). Studies with SA immigrants in the UK also reveal that

SAs are likely to rely on traditional healers along with Western medical help for their mental

health problems (Greenwood, Hussain, Burns & Raphael, 2000; Hussain & Cochrane, 2004).

Other socio-cultural factors including stigma, ignorance of symptoms by family members,

rigid gender norms within the family, an expectation of quick fixes for mental health

problems (Conrad & Pacquiao, 2005), dependence of women on other family members to

seek treatment and lack of familiarity with SA culture among health practitioners (Ahmed &

Lemkau, 2000) interfere with utilization of mental health services by SAs.

In the U.S. financial barriers also pose a major structural barrier to utilization of

mental health services by low income groups (Sareen, Jagdeo, Cox, Clara, Have, Belik, et al.,

2007). Among immigrants, such barriers are reflected in the number of immigrants without

health insurance. Twelve percent of the SAs in the U.S. do not have health insurance as

compared to 10.7% of non-Hispanic Whites (Huang & Carrasquillo, 2008), and of the

uninsured, 40% do not have a usual source of care (Minority Health Initiatives, 2006). In the

U.S. general health services are increasingly being used for mental health problems (Wang,

Demler, Olfson, Pincus, Wells & Kessler, 2006). It is also known that across countries with

different cultures people suffering from depression seek health services for somatic

complaints and do not voluntarily report psychological problems (Simon, Vonkorff, Piccinelli, Fullerton & Ormel, 1999). Whether somatization is associated with utilization of general health services among SA immigrants is not known, but research with other immigrants such as the Chinese Americans (Kung & Lu, 2008) and Ethiopian immigrants in Canada (Fenta, Hyman & Noh, 2006) indicates that somatization may influence SA's utilization of health services.

B.   Why this study?

Mental health issues of SA immigrants in the U.S. have not been adequately studied because of the myth of the model minority. An increasing number of SAs who continue to immigrate to the U.S. are older, less educated and dependent on families who have immigrated in the past (Nandan, 2007). As lower socio-economic status is associated with high risk for CMD (Fryers, Melzer & Jenkins, 2003), these immigrants are likely to be more vulnerable to suffering from these disorders. Hence, this study was conducted to understand how different demographic factors influence CMD along with other psychosocial factors. This study addressed two main gaps in the current literature on mental health of SA immigrants: a) it included somatization, a socio-culturally important mental health issue among SAs, along with depression and anxiety and b) it studied the role acculturation and social support simultaneously play in influencing CMD in SA immigrants.

There is almost no empirical literature from studies in the U.S. that gives any information about SA immigrants' use of health services for mental health problems. This study addressed this gap by examining whether depression, anxiety and somatization predict use of general health services. Additionally, for the first time, the role of different psychosocial factors such as acculturation, social support, negative beliefs about mental

illness, stigma and insurance in influencing the association between these disorders and use of general health services was studied.

C. Theoretical Background

1. Background of Conceptual Frameworks

Conceptual frameworks explaining the impact of migration on psychological outcomes emphasize the differences in the social and environmental contexts of an immigrant's society of origin and the host society. These frameworks also include other factors such as the actual migration experience and socio-demographic characteristics of the immigrants that determine how well immigrants adjust to the environment of the host society (Portes, Kyle & Eaton, 1992; Rogler, 1994). Bhugra (2004) depicted this process as involving three stages, namely, pre-migration, migration and post-migration. Bhugra hypothesized that vulnerability and resiliency factors at each stage determine how well a person acculturates with the host society, which in turn determines mental health outcomes such as severe and common mental disorders. In Bhugra's framework, the vulnerability factors during migration include loss, bereavement and post-traumatic stress disorder (PTSD). The resiliency factor in this stage is social support. The vulnerability factors during the post-migration stage are culture shock, culture conflict and discrepancy in aspiration/achievement; resiliency factors in this stage are positive cultural identity, social support and socio-economic advantage.

Researchers have also acknowledged the role of culture in influencing immigrants' mental health. Bhugra (2005) has hypothesized that incongruence between the immigrants' native and host culture can predict psychological distress. According to this hypothesis when people from collectivist societies migrate to individualistic cultures a dissonance is caused due to the differences in values, beliefs and aspirations, and that causes distress. Hwang, Myers, Abe-Kim and Ting (2008) have proposed the Cultural Influences on Mental Health

Model (CIMH) which asserts that the culture of an individual influences six mental health domains including the two domains relevant to this study – phenomenology of distress and coping styles, and help-seeking pathways.

Theoretical frameworks explaining use of health services suggest that several individual-level and environmental-level factors can influence utilization of health services. For example, according to Andersen's (1995) behavioral model, personal health practices and use of health services are influenced by individual level factors such as the individual's predisposition to use services, factors that enable or impede the use of services and the individual's need for care, in addition to the context of environment and health care system. Portes, Kyle and Eaton (1992) proposed that in addition to predisposing, enabling and need factors, contextual factors (environmental factors) related to the exit of refugees from their respective countries as well as factors related to their reception in the host country also influenced their help-seeking patterns.

It is evident from the frameworks discussed above that the study of mental health outcomes in immigrants as well as their health service use involves understanding the role of different social, cultural and environmental factors. These frameworks fit into the ecological paradigm, which in principle states that developmental outcomes and behaviors are a joint function of the interaction of person and environment (Bronfenbrenner, 2005). As the ecological paradigm facilitates the study of the impact of different environmental variables, it is particularly suitable to the study of immigrants' health and health behaviors wherein a multitude of environmental factors influence the health and service use of immigrants. Such environmental factors can be studied at different levels as explained in Bronfenbrenner's ecological systems theory (Bronfenbrenner). The microsystemic level includes the "[p]attern of activities, roles, and interpersonal relations experienced by the developing person in a

given face-to-face setting with particular physical and material features and containing other persons with distinctive characteristics of temperament, personality and systems of belief" (p. 148). The mesosystemic level includes the "[l]inkages and processes taking place between two or more settings containing the developing person" (p. 148). The exosystemic level includes "[p]rocesses taking place between two or more settings, at least one of which does not ordinarily contain the developing person, but in which events occur that influence processes within the immediate setting that does contain that person" (p. 148). The macrosystem consists of the "[c]haracteristics of a given culture, subculture, or other broader social context which influence an individual". An important level of influence that marks the utility of the ecological systems theory in studying the changes inherent in the process of immigration is the chronosystemic level. The chronosystemic level includes the changes in environment that occur with time and influence the individual. These changes can include normal transitions that occur with time or events that may be unexpected and yet influence the individual (Bronfenbrenner, 1986, 2005). This study's conceptual framework draws from two ecological frameworks that are based on ecological systems theory. These frameworks are explained in the following section.

2.   Conceptual Framework for this Study

To understand the influences of social and environmental factors on CMD in SA immigrants, this study followed Bronfenbrenner's ecological model as explained by Serdarevic and Chronister (2005). According to this model the immigrants' microsystem includes the family, friends, work and church, mesosystem includes the relationships between family members or other people in the immigrant's microsystem, exosystem includes public policies and government activities that can be of specific relevance to immigrants, macrosystem includes the beliefs and attitudes of American people toward the immigrants,

and chronosystem includes acculturation of immigrants as it involves the changes in immigrants' relationships with the host society over a period of time. Serdarevic and Chronister advocate for the use of ecological systems to study immigrants' mental health outcomes as it enables the study of the bidirectional nature of individual-environment interactions at different levels along with the temporal changes in these outcomes.

This study applied Serdarevic and Chronister's (2005) model by including two factors at the mesosystemic and chronosystemic levels that can influence the mental health outcomes in South Asian immigrants. It included social support as a mesosystemic variable because social support is generated primarily in the relationships formed between the systems to which the individual belongs and other systems in the individual's immediate context. It included acculturation as a chronosystemic factor because it is dynamic and can change with the passage of time. The dynamic nature of acculturation was measured using different aspects of acculturation, namely the number of years the immigrants had stayed in the U.S., their fluency in English and their cultural identity.

The study drew from the ecological model proposed by McLeroy, Bibeau, Steckler and Glanz (1988) to study factors influencing South Asians' utilization of health services. According to this model, health behaviors are determined by various individual and social, environmental factors operating at different levels. Drawing from Bronfenbrenner's ecological systems theory this model categorizes environmental factors into five types. The intrapersonal factors include the developmental history of the individual and include the individual's knowledge, attitudes, behaviors, skills, etc. The factor of interpersonal processes and primary groups includes formal and informal social networks and social support systems. The institutional factors include the formal and informal rules and regulations of social systems that govern an individual. The community factors include relationships among

organizations, institutions, and informal networks within defined boundaries. The public policy factors include local, state and national laws and policies. The model suggests that using this framework to analyze environmental factors that influence health behaviors can be useful for the development of health promotion interventions.

This study applied this model and analyzed the following factors at three different levels. The intrapersonal factors included were the socio-cultural factors specific to SAs including somatization, negative beliefs about mental illnesses, and stigma associated with seeking help for mental health problems. The interpersonal processes included were the factors of acculturation and social support available to the individual. Acculturation was included in this factor as there is a mutually reciprocal relationship between acculturation and formal and informal relationships of a person. The institutional factor included in the study was the individual's health insurance status.

The two outcomes studied in this study were the mental health outcomes (depression, anxiety and somatization) and the utilization of health services. It is evident from the application of the two models described above that in theory the two factors of acculturation and social support were associated with both these outcomes. The other intrapersonal and institutional factors including negative beliefs about mental illnesses, stigma and insurance status were conceptualized as factors determining utilization of health services only. In order to be able to study the effects of acculturation and social support on both outcomes, a conceptual framework was developed by integrating the two ecological models (Fig. 1). The integrated model enabled studying the influence of acculturation and social support on both outcomes and also permitted studying the role of other factors independently. In this model the socio-demographic factors that are known to influence both outcomes are also depicted along with acculturation and social support.

Figure 1. Conceptual framework of the study

† Somatization is also conceptualized as intrapersonal factor influencing utilization of health services
* Control Variables: Self-reported health condition, Diagnosed Health Conditions

D.   Conceptual Definitions of Variables in the Study

1.   Independent Variables

a.   Years of Education

This was conceptualized as the level of formal education completed by the participant.

b.   Monetary Resources

This was conceptualized as the perceived adequacy of monetary resources needed for a family and was measured with a standardized scale.

c.   Insurance Status

The availability of health insurance to an individual from any source of insurance was conceptualized as affirmative insurance status of that participant.

d.   Employment

This was conceptualized as the current employment status of the participant. Participants employed in part-time or full time jobs were considered employed and those not working were considered unemployed.

e.   Acculturation

Three different indicators were used to conceptualize acculturation.

1)   Cultural identity

The understanding of cultural identity was guided by the social identity approach that focuses on people's cognitions about their own and host culture (Ward, 2001). Accordingly cultural identity was conceptualized as an individual's status on a continuum of South Asian identity to Western identity with regard to different aspects of acculturation such as use of language, self-perception of identity, friendships, food

preferences and recreation (Suinn, n.d.). The current level of acculturation was measured using a standardized measure of acculturation.

2) Duration of stay in U.S.

This was conceptualized as the duration of the participant's stay in U.S. and longer duration was considered to be indicative of a greater degree of acculturation.

3) Fluency in English Language

This was conceptualized as the ability to understand and speak English. Not being able to understand or speak English was considered as indicative of no acculturation and ability to speak and understand English well was considered to be indicative of greater acculturation.

f. Social Support

Social support was conceptualized as the participant's sense of support derived from both quantitative and qualitative aspects of support available to the participant (Dolbier & Steinhardt, 2000).

g. Negative Beliefs about Mental Illness

These were conceptualized as beliefs that evaluate having a mental illness or people suffering from a mental illness with negative associations or outcomes in a social context. Beliefs of two types, namely, the belief that mental illnesses are incurable and people with mental illness have poor social skills are included in this study (Hirai & Clum, 2000).

h. Stigma

This was conceptualized as the stigma perceived in seeking help for mental health problems from mental health practitioners (Komiya, Good & Sherrod, 2000).

2.   Dependent Variables

a.   Common Mental Disorders

These were conceptualized following the dimensional perspective on CMD and accordingly severity of symptoms of depression, anxiety and somatization were used as indicators of CMD. The symptoms used for measuring severity were from the Patient Health Questionnaire (PHQ; Spitzer, Kroenke, Williams & The Patient Health Questionnaire Primary Study Group, 1999), a measure based on the DSM-III-R and DSM IV classifications.

b.   Utilization of Health Services

This was measured with two indicators.

1)   General Health Service Use

The participant's report of visiting a regular doctor in the last three months was treated as utilization of general health service. For participants who did not have a regular doctor, it was assumed that they had not used general health services in the last three months.

2)   Mental Health Service Use

The participant's report of having sought help for mental health problems from a mental health practitioner, general physician, family doctor or other specialist in the last 12 months was treated as utilization of mental health services.

3.   Control Variables

a.   Self-reported Health Condition

This was conceptualized as the subjectively perceived quality of present health status.

b.   Diagnosed Health Conditions

This referred to the participants' report of different health conditions as diagnosed by a doctor. Five conditions were included in this study, namely, cancer of any type (breast, cervical, colorectal), diabetes, heart attack, high blood pressure and stroke.

E.   **Research Questions**

The following research questions were addressed in this study.

1)   Can depression, anxiety and somatization among the South Asian immigrant population be represented by a combined factor representing psychological distress?

2)   To what extent do acculturation and social support predict depression, anxiety and somatization?

3)   Do the factors of acculturation and social support interact in predicting anxiety, depression and somatization?

4)   Is the association between acculturation, social support and depression, anxiety and somatization moderated by the socio-demographic factors of gender, education and monetary resources?

5)   To what extent do SAs suffering from depression, anxiety and somatization utilize health services?

6)   To what extent is utilization of health services predicted by depression, anxiety and somatization?

7)   To what extent do acculturation, social support, negative beliefs about mental illness, stigma, and insurance status influence utilization of health services?

8)   To what extent do gender, education, monetary resources, acculturation, social support, and socio-cultural factors (negative beliefs about mental illness and stigma), and insurance status moderate the association between depression, anxiety and somatization and utilization of health services?

II. REVIEW OF LITERATURE

A. Background of SA Immigrants in the U.S.

1. History of South Asian Immigration to the U.S.

People from SA countries immigrated to America in three waves. The first

wave of SA immigrants consisting of male Sikh Punjabi farmers from India settled in

California between the mid 1800s and early 1900s (SAALT, 2005). The growth of SAs who

immigrated during this time period was restricted by restraining naturalization laws that did

not allow SA immigrants to bring their family members to America (SAPHA, 2002). In the

later period two developments led to the allocation of yearly quotas for SA immigrants. The

first was in 1946 when many Indians in the U.S. lobbied to get an immigration quota under

the Luce-Cellar Bill which hitherto did not include India in the list of countries from where

people were allowed to immigrate. The second was that in 1947-48 as the British Empire

gave way to independent nations, India, Pakistan, Sri Lanka, and Burma were allotted an

independent yearly quota of 105 immigrants (Leonard, 1997).The real increase in SA

immigration, referred to as the second wave of SA immigration to the U.S., occurred with the

passage of the Immigration and Naturalization Act of 1965. Under this law visas were issued

according to national origin on the basis of preferred skills or family reunification and an

annual allocation of 20,000 immigrants per country was made under different immigrant

categories (Leonard, 1997). Soon a large number of highly skilled and educated SAs

immigrated and established themselves in the fields of science, engineering and medicine

(SAALT, 2005). By 1980 the numbers of SAs in the U.S. further increased with the

expansion of the information technology sector which led to the migration of many highly

skilled professionals, students and their families to the U.S. (SAPHA, 2002). This gave rise to

the notion of the "model minority", the impression that all SAs are highly educated, well-to-

do people. The third wave of SA immigrants came after 1985 with the extension of 1965 Act

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that allowed families of settled professionals to immigrate to the U.S. (SAPHA, 2002). South Asian immigrants from this wave continue to immigrate to date and are often referred to as the recent wave of immigrants. The recent immigrants include many not so highly educated and older people who are brought to the U.S. by permanently settled SAs from earlier generations (Leonard, 1997; Nandan, 2007). With an increasing number of recent immigrants the socio-demographic profile of SAs in the U.S. has changed.

2. Socio-demographic Profile of South Asians in the U.S.

As SAs continue to immigrate to the U.S. they have become the third largest group of Asian immigrants with a population of 1.9 million next to 2.7 million Chinese and 2.3 million Filipinos (Barnes & Bennett, 2002). Based on the U.S. Census data SAALT (2007) compiled a report on demographic characteristics of SAs in the U.S.. This report reveals that the demographic profile of SAs in 2000 is characteristically different as compared to the 1990 census. There are now a greater number of immigrants from smaller SA countries like Pakistan, Bangladesh and Sri-Lanka. For example, from 1990 to 2000 the population of Bangladeshis in the U.S. increased by 249% as compared to the 106%, 89% and 84% increase in populations of Indians, Pakistanis and Sri Lankans. Despite the disparity in the rates of this increase, Indians continue to be the largest group and constitute 89% of the SA population in the U.S.. South Asians are now more spread out geographically in the U.S.; New York/New Jersey, San Francisco Bay Area, Chicago, Los Angeles and the Washington DC Metro area are the five metropolitan areas with the largest SA populations. South Asians are no longer a homogenous group of well-educated, occupationally well-placed and economically prosperous people. Of the SAs in U.S. more than 200,000 Asian Indians (13.2% of Asian Indians in the U.S.) have incomes less than 125% of the poverty level and 49.4% of Bangladeshis and 37.8% of Pakistanis earn less than 200% of the poverty level (SAALT, 2007). Though many SAs continue to have employment in technology and medical

fields, some are employed in lower wage jobs such as cashiers, taxi drivers, food prep and

servers, restaurant workers and cashiers. The low end jobs are the most common among

Bangladeshis who are also the fastest growing SA immigrants. Employment rates of SAs are

also disproportionate for men and women. Though women comprise 46% of the SA

population in the U.S., the percentage of men earning more than $57,000 every year is more

than double the women. Furthermore, the percentage of women earning less than $12,500

every year is more than double the men earning at that income level. Another important facet

is the increasing proportion of elderly people. According to the Census of 2000, among

Asians, Asian Indians (AI) had the fourth largest group of people over the age of 55 years

comprising approximately 10% of the total AI population in the U.S. (Nandan 2007; Freeman

& Chang, 2003 cited by Nandan, 2007).

      The above data illustrate that SAs in the U.S. are more diverse than ever. Among AIs

the diversity is on account of multiple languages spoken, multiple religions practiced, and

higher degree of identification with the province of origin rather than the nationality (Kar,

Campbell, Jimenez & Gupta, 1995). Similar diversity exists among SAs from other countries.

However, this diversity belies the sociocentric and collectivistic nature of SAs which

characterizes the common identity of SAs as a group. Consistent with the sociocentric nature

of SAs, Segal (1991) identified core values of Asian Indians which included: a) their

allocentric nature which demands that an individual is not idiocentric and makes sacrifices

for the group, particularly for the family and b) a sense of dependency within the family

which fosters dependence of women and children on authoritative males in the family.

Another aspect common to SAs is the secondary status ascribed to women (Tewary, 2005).

This socio-cultural background of SAs poses a challenge for many in adjusting to the

American lifestyle which is guided by individualism. This transition can be difficult for SAs

and can influence their mental health (Ahmad, Shik, Vanza, Cheung, George & Stewart,

2004; Choudhry, 2001). Due to the difficulties faced in this transition SAs may suffer from CMD.

B.   Common Mental Disorders and Somatization

1.   Depression and Anxiety

The public health significance of CMD cannot be underestimated. Globally depression was estimated to be the fourth leading cause of disability among people of all ages and the second leading cause among people of age 15-44 (World Health Organization, 2001). The National Comorbidity Survey - Replication (NCS-R) conducted between 2001-2003 showed that in the U.S. 28.8% suffer from at least one anxiety disorder and 16.6% and 2.5% suffer from major depression and dysthymia respectively (Kessler, Berglund, Demler, Jin, Merikangas & Walters, 2005). The 12 month prevalence rates are comparatively lower; 18.1% for any one anxiety disorder and 6.7% and 1.5% for major depression and dysthymia respectively. However, the severity-wise distribution for the three disorders shows that more than two thirds of the people suffering from depression (80.2%) or dysthymia (81.8%) and a little more than half suffering from an anxiety disorder (56.5%) suffer from a moderate or severe level of the disorder (Kessler, Chiu, Demler & Walters, 2005).

a.   Socio-demographic correlates of depression and anxiety

While there is a genetic pre-disposition for CMD, these disorders start in the presence of social, psychological and cultural factors (Goldberg & Goodyear, 2005). Such factors studied include markers of social position or socio-economic status such as education, employment status, income and material standard of living and occupational status. In a review of nine community-based studies of general household populations conducted in the UK and other developed countries eight studies provided evidence for this association (Fryers, Melzer & Jenkins, 2003). More importantly, none of the studies in this review showed a negative association between any marker of lower social position and rates

of CMD. Research also indicates that people disadvantaged due to poverty related factors are at higher risk of these disorders. In European and other developed countries relatively high frequencies of CMD are associated with poor education, material disadvantage and unemployment; people who are most socioeconomically disadvantaged have one and half to two times higher risk for CMD than most advantaged people (Fryers, Melzer, Jenkins & Brugha, 2005). Patel and Kleinman (2003) reviewed eleven community based studies from developing countries including four studies from Pakistan. This review also found that factors related to income such as poor housing and poor living conditions were associated with CMD.

Common mental disorders are associated with lower education and income levels in the U.S. as well. The findings from the National Comorbidity Study (NCS) revealed that compared to people with more than 16 years of education, people with less than eleven years of education are approximately two times (OR = 1.79, CI = 1.3-2.43) more likely to suffer from any affective disorder and approximately three times (OR = 2.82, CI = 2.26-3.51) more likely to suffer from any anxiety disorder (Kessler, McGonagle, Zhao, Nelson, Hughes, Eshleman, et al., 1994). However, according to the more recent NCS-R people with lower levels of education were not at significantly higher risk for any anxiety or any mood disorder (Kessler, Berglund, Demler, Jin, Merikangas & Walters, 2005). With regard to income levels, the NCS showed that compared to people earning more than $70,000 per year, people earning less than $19,000 per year had higher odds of suffering from any affective disorder (OR = 1.73; CI = 1.29-2.32) and any anxiety disorder (OR = 2.12; CI = 1.63-2.77) (Kessler, McGongale, Zhao, Nelson, Hughes, Eshleman, et al., 1994).

The association of social class with common mental disorders has also been studied. The concept of social class, though closely related to each of the indicators of socio-economic status discussed above, is distinct and drawn from sociological theory. Social

classes are hierarchically arranged, socially independent groups that reflect the inequities in economic and political power and resources in society (Yu & Williams, p.160). Social class has been operationalized as occupational social class with gradations in class defined on the basis of control over one's work environment and power that one has at the workplace (Bartley, 2003). The rates of CMD are found to be higher among people from lower social class (Weich & Lewis, 1998) and people from middle level social class such as low-level supervisors (Muntaner, Borrell, Benach, Pasarín & Fernandez, 2003; Muntaner, Eaton, Diala, Kessler & Sorlie, 1998).

Gender is another known correlate of depression and anxiety. In the U.S. women are approximately one and half times more likely (OR = 1.6; CI = 1.5-1.8) than men to suffer from any anxiety disorder and any mood disorder (OR = 1.5, CI = 1.3-1.7) (Kessler, Berglund, Demler, Jin, Merikangas & Walters, 2005). There is no clear understanding of the reasons behind this gender difference. Piccinelli & Wilkinson (2000) reviewed literature on risk factors leading to gender differences in depression. They attributed gender differences to adverse experiences in childhood, depressive and anxiety disorders in childhood, socio-cultural roles with related adverse experiences, and psychological attributes related to vulnerability to life events and coping skills. They also ruled out the role of genetic, biological and social support factors in giving rise to this difference.

2.   Somatization

Stated simply, somatization is the phenomenon when a person reports several somatic symptoms that cannot be attributed to any organic causes. These unexplained symptoms are attributed to psychological problems experienced by the person. For example, Kroenke, Spitzer, Jane & Williams (2002) described somatization as "[t]he association of medically unexplained somatic symptoms with psychological distress and health-seeking behavior" (p. 258). In mental health literature somatization has been interpreted in several

ways. In a review of the concept Kirmayer and Young (1998) noted that early psychoanalytic

understanding of somatization as transformation of psychological distress into bodily

symptoms has undergone change. They summarized several ways somatization has been

conceptualized and interpreted: a) somatization is conceptualized as an index of symptoms

that cannot be explained medically (termed as "medically unexplained symptoms");

clinicians usually assume that a medical explanation exists even if it cannot be confirmed; b)

the psychodynamic view attributes somatic symptoms to intrapsychic or interpersonal

problems which may not be in the awareness of the individual; c) a "somatic amplification"

style or personality traits may lead an individual suffering from psychopathology to

experience and report more distressing somatic symptoms; d) the experienced somatic

symptoms may be an "idiom of distress" that signifies specific meaning to the suffering

person and others sharing the person's cultural background but not to outsiders; this can be a

culture bound syndrome which could be a combination of somatic, emotional and social

meanings and may form a specific ethnomedical theory not known to outsiders; e) a chain of

experienced somatic symptoms may be a metaphor of experience such that the suffering

person is able to convey specific affective meaning based on present somatic experiences and

memories of salient experiences; f) the "social positioning" explanation which means that

somatic symptoms help the suffering person to position in a manner that can help to

reconfigure family relationships and social roles; this positioning may happen with or without

the awareness of the person; g) the somatic symptoms experienced by the powerless in the

society signify or indicate a protest against the social structures.

The complexity involved in explaining somatization is evident from the above

discussion. However, the focus of the present study was not to unravel this complexity or

study a particular approach to understanding somatization. Therefore, it relied on a broader

understanding of somatization as somatic distress (Gucht & Fischler, 2002) and focuses on

the number of somatic symptoms and their severity. This approach is reflected in the current

diagnostic criteria for somatization in both DSM IV and ICD 10 and also in the PHQ 15

somatization scale used in the SAHDS. With this understanding the current study aims to

examine the association of somatization with anxiety and depression and to examine whether

it has a specific role in influencing utilization of health services.

Somatization is included along with anxiety and depression in the current study for

two reasons. First, somatization needs to be included because empirical evidence suggests

that SAs may report somatic symptoms more than psychological symptoms (Minhas &

Nizami, 2006; Patel, Pareira & Mann, 1998) and that SAs may seek treatment for somatic

symptoms but not symptoms of depression and anxiety (Raguram, Weiss, &

Channabasavanna, 1996). Second, anxiety, depression and somatization are known to be

associated with each other (Simon, Gater, Kisley & Piccinelli, 1996) and are the three most

common mental health problems seen in primary care (Korenke, 2000; Spitzer, Williams,

Kroenke, Liner, deGruy, et al., 1994; Ormel, Von Kroff, Ustun, Korten & Oldehinkel, 1994).

3.   Relationship of Somatization with Common Mental Disorders

Common mental disorders are studied from two perspectives – categorical and

dimensional (Goldberg, 2000). Categorical perspective posits that anxiety and depression are

two distinct and different disorders that can be identified as more symptoms belonging to

either are found. Accordingly, if a person has symptoms of both disorders, then the person is

likely to be suffering from two distinct disorders and if the person qualifies for criteria of

both disorders, s/he is considered to suffer from two co-morbid disorders. The dimensional

perspective on the other hand considers that symptoms of these two disorders can overlap and

the person having symptoms of both anxiety and depression is suffering from common

underlying psychological morbidity. The dimensional approach conceives of common mental

disorders "[a]s extreme points on continua that span a range of emotional and behavioral

functioning" (Krueger, 1999, p. 922).

Somatization has been studied along with the CMD as somatic symptoms are part of

the experience of depression and anxiety for many people. The relation between depression,

anxiety and somatization (as a disorder defined according to nosological systems and as

index of somatic symptoms) has been studied from both the categorical and dimensional

points of view. In a World Health Organization (WHO) collaborative study of primary care

patients conducted in 14 countries, among patients having somatization disorder, 31.4% had

major depressive disorder, 16.7% had any other depressive disorder and 22.4% had an

anxiety disorder. Overall, 57.7% of the patients diagnosed with somatization disorder had

comorbid anxiety or depressive disorders (Barsky, Orav & Bates, 2005). In the same study

symptom scores were also correlated; correlation between depression and anxiety scores was

0.52 and somatization scores were correlated with depression ($r =.33$) and anxiety ($r =.40$)

(Simon, Gater, Kisley & Piccinelli, 1996).

With a dimensional perspective, more recent research has focused on understanding

whether a continuum underlies these disorders. Factor analyses conducted with two national

datasets in the U.S., namely NCS and NCS-R show that anxiety and depressive disorders load

heavily on a single factor (Krueger, 1999; Kessler, Chiu, Demler & Walters, 2005). A more

recent study analyzed seven commonly occurring mental disorders studied in the WHO

collaborative study and evaluated the fit of four different factorial models to examine the

underlying dimensions (Krueger, Chentsova-Dutton, Markon & Goldberg, 2003). The

findings showed that for all countries the best fitting model was a two factor model that

differentiated between internalizing syndromes including symptoms of anxiety, depression

and somatization that represented six of the seven disorders under study and externalizing

syndromes that included hazardous use of alcohol.

C. Common Mental Disorders and Somatization in SA Immigrants

1. The Influence of SA Socio-cultural Background

The South Asian understanding of health and illness is influenced by the rich traditions of alternate health systems such as the Ayurveda and Unani Tibb (Malik, 2000; Weiss, Desai, Jadhav, Gupta, Channabasavanna, et al., 1988). The influence of these traditions is evident in SAs' holistic perspective that integrates psychological and physical aspects of health. Consistent with this holistic perspective, a qualitative study conducted within a constructivist paradigm with SA women in the UK revealed that women's perception of causes, symptoms and treatment of depression was based on multiple categories of health problems, namely physical, psychological or spiritual problems (Hussain & Cochrane, 2004). As a consequence of this holistic perspective SAs may suffer from psychological problems but not report them as mental health problems (Durvasula & Mylvyganam, 1994).

Several studies that have used vignettes to understand SAs' understanding of depression illustrate that SA perspective is different from the Western perspective. These studies show that SAs may label depression differently. For instance, in a cross-cultural study, only 15% of indigenous Pakistanis identified the person in the vignette as suffering from "depression" as compared to 45% British Pakistanis. Though the majority of participants in this study had heard of someone who suffered from depression, many of the indigenous Pakistanis called it "*parishani*" (distress) or "*zahni daboa*" (mental tension) which reflected the Unani Tibb influence. Accordingly, distress was associated with the body, resulting in interconnected affective, somatic and social-behavioral symptoms (Malik, 2000). Research also suggests that SAs perceive "worrying excessively" as a distinctive attribute of depression as compared to low mood which is considered to be distinctive

according to the Western psychiatric conceptualization of depression (Karasz, Dempsey & Fallek, 2007; Lawrence, Murray, Banerjee, Turner, Byng, et al., 2006).

Studies on somatization among South Asians highlight the influence of ethnocultural factors on common mental disorders among South Asians. A series of three epidemiological surveys of rural and urban populations in Pakistan used a culturally sensitive scale to measure somatization along with other measures of CMD (Minhas & Nizami, 2006). These studies revealed that though 66% of women and 25% of men suffered from anxiety and depressive disorders, the predominant complaints of these people were somatic complaints. Minhas and Nizami have attributed the predominance of somatic complaints in these studies to lack of psychological mindedness among non-Western people and have explained that people expressed emotional difficulties somatically due to lack of abstract language or concepts to communicate emotional distress. This explanation is consistent with the widely held premise that people from developing countries are less likely to report psychological symptoms. However, other empirical evidence suggests that South Asians are as likely as Westerners and Europeans to experience psychological symptoms. A notable study was conducted with primary care attendees in Goa, India (Patel, Pareira & Mann, 1998). This study measured the prevalence of CMD in community using a standardized measure and also used the Explanatory Model Interview (EMI; a semi-structured interview protocol) to elicit the respondents' explanatory models of their illness. Based on the EMI data the study categorized respondents according to whether they attributed the experience of a common mental disorder to bodily causes only (pure somatizers) or to mind or soul (psychologizers) or had mixed attributions (facultative somatizers). Findings of this study showed that 46.5% of the respondents were suffering from CMD. Of those who suffered from a CMD, 98% reported with somatic complaints as their primary complaints. However, 35% of these people were pure psychologizers and 16% were facultative somatizers; more than 50% thus had a

component of psychological attribution to their illness. Similar findings were reported in another Indian study wherein 60% of psychiatric outpatients suffering from depressive and somatoform disorders reported somatic symptoms (Raguram, Weiss, Channabasavanna & Devins, 1996). Interviews conducted with these patients revealed that though both depressive and somatic symptoms were distressing, people reported somatic symptoms as they did not find it stigmatizing as in the case of depressive symptoms.

Studies with SA immigrants also confirm that the SAs living in a different socio-cultural context continue to have a perspective that integrates the elements of biological and psychological perspective to common mental disorders. A mixed-method study conducted in New York with 36 immigrant SA and 35 European American (EA) women constructed scales from women's narratives to measure whether the women relied on a bio-psychiatric model (BPM) or a situational model (SM) to conceptualize depression (Karasz, 2005). Compared to EA women, SA women had significantly lower scores on the BPM scale and significantly higher scores on the SM scale revealing that SAs are more likely to explain depression in the context of social and interpersonal factors. Consistent with the findings of this study, research conducted with SA immigrants in the UK shows that SAs locate depression in a social context (Lavender, Khondoker & Jones, 2006; Lawrence, Murray, Banerjee, Turner, Sangha, et al., 2006).

In the New York based study with SA and EA women, researchers also compared their medically unexplained symptoms. Among both groups most common psychological symptoms included anger, sadness, boredom or apathy and anxiety and most common physical symptoms were pain, fatigue and stomach symptoms. Also, both groups reported a similar number of symptoms when they identified the most salient symptoms in an illness episode (that is an illness problem identified by the women) in the previous year. Though symptoms of these illness episodes were a mix of both physical and psychological symptoms,

SA women reported a greater proportion of physical symptoms (69%) and less proportion of psychological symptoms (30%) as compared to EA women reporting physical (53%) and psychological (45%) symptoms (Karasz, Dempsey & Fallek, 2007). Among SA women psychological illness episodes were less common because they considered physical symptoms more important. Though the majority of illness symptoms of SA women were physical, on enquiry women revealed underlying psychological distress. The difference between EA and SA women was that SA women had a greater tendency to attribute their somatic symptoms to physiological problems than psychological problems. However, all SA women may not have this tendency. Women who are educated, have high incomes and are acculturated with the foreign culture are likely to have a more Westernized bio-medical understanding (Karasz, 2005).

2. Prevalence of CMD in SA Immigrants

The prevalence of anxiety and depression among foreign born SA immigrants was recently reported from the National Latino and Asian American Study (Masood, Okazaki & Takeuchi, 2009). Though only 165 SAs were enrolled in the NLAAS, weighted prevalence rates have been reported. Lifetime prevalence rates of DSM IV diagnoses of affective and anxiety disorders were 2.7% and 5.3% and twelve month prevalence rates were 1.2% and 3.3%. For subthreshold affective disorders the lifetime prevalence rates and 12 month prevalence rates were 4.4% and 0.8 and for subthreshold anxiety disorders were 13.1% and 5.9% respectively. These rates were comparable or lower as compared to rates for all Asian Americans. This study also found women were likely to have more life time anxiety disorders than men, but there were no gender differences in regard to affective disorders. The findings of this study should be interpreted with caution in view of the small sample size.

Another national study on maternal depressive symptoms has reported rates for Asian Indian (AI) mothers (Huang, Wong, Ronzio & Yu, 2007). This study reported rates of

depression in a cohort of new mothers during the first nine months after childbirth in 2001 from a nationally drawn sample of 7,676 that included 205 AI women. Among AI mothers 34.9% had depressive symptoms and among those suffering from depression 2.8%, 11.9% and 20.3% had severe, moderate and mild depression respectively. The prevalence of depression among AI mothers was less than that among other Asian (60.0%) and White (59.1%) mothers. Although the prevalence was lower among AI mothers an important aspect revealed by this study was the greater percentage American born AI mothers (85%) that did not suffer from depression compared to native-born AI mothers (64.2%). The findings of this study cannot be generalized as the study included only women who gave birth recently.

Reviews of studies on CMD among SAs in the U.K. (Anand & Cochrane, 2005; Hussain & Cochrane, 2004; Bhui, 1999) note that current research does not conclusively inform as to whether SA immigrants suffer more or less from CMD compared to White British people. However, Anand and Cochrane (2005) note that though earlier studies conducted in the 1970s and 1980s showed lower rates of anxiety and depression among SA immigrants, recent studies suggest a higher prevalence of depression, suicide, deliberate self-harm and eating disorders among women. They also observed that many large scale studies in the UK identify Pakistani Muslim women as more vulnerable to depression and anxiety compared to women belonging to other British SA communities and indigenous White women. Additionally, these reviewers note that rates of anxiety and depression among SAs in the UK appear to be dependent on several factors including the SA subgroup under study, sample size, generational and demographic factors, participants' level of acculturation, sensitivity of measures used, and methodological soundness of the study.

3.   Predictors of CMD in SA immigrants

After immigration an important aspect of life for SAs is the difference between the SA and American socio-cultural environments. While SAs come from socio-

centric and collectivistic societies, the egocentric and individualistic American culture demands different behavior and conduct. Bhugra (2005) has theorized that the lack of congruence in the two cultures can increase the vulnerability of immigrants to common mental disorders. Research shows that SAs experience this incongruence in the form of clash of values in their day to day affairs (Inman, Howard, Beaumont & Walker, 2007) and that cultural and intergenerational conflict within the family is associated with greater psychological distress (Masood, Okazaki & Takeuchi, 2009). As SA immigrants of the recent wave are dependents, older and not as well-to-do as earlier immigrants, a source of distress may be the discrepancy between their expectations for a materially better life and the incongruent reality of living. On the other hand SAs can be expected to demonstrate resilience if they have social support from fellow SAs and are well supported by their sponsors who brought them to the U.S. Research in this area, though limited, provides useful insights about the relation between SA immigrants' lives and CMD. This research is summarized in the following sections.

a. Acculturation of SA Immigrants

1) The Concept of Acculturation

Acculturation is classically defined as "those phenomena which result when groups of individuals having different cultures come into continuous first hand contact, with subsequent changes in the original cultural patterns of either or both groups" (Redfield, Linton & Herskovits, 1936 cited by Sam, 2006)). Acculturation has been studied with three theoretical approaches: "culture learning approach", "stress and coping approach" and "social identity approach" (Ward, 2001). Ward explains the three approaches using the A-B-C framework signifying the affective, behavioral and cognitive focus of these approaches. The stress and coping approach focuses on the affective and coping components (A) involved in adjusting to the stress provoking changes involved in cross cultural transition,

the culture learning approach focuses on the behaviors and skills (B) needed to adapt to the new cultural context and the social identity approach focuses on people's perceptions and cognition (C) about their own and host culture.

The SAHDS adapted the Suinn-Lew Asian Self Identity Acculturation Scale (SL-ASIA scale; Suinn , Ahuna & Khoo, 1992, Suinn, n.d.) and thus adopted the social identity approach to measure acculturation. Applied at the individual level, this approach views "[a]cculturation as a state, rather than a process, and is concerned with measuring the construct at a single point in time and identifying its relevant predictors, correlates and consequences" (Ward, 2001, p. 413). Applying the social identity approach, acculturation is conceptualized in three different ways (Ward, 2001). At the most basic level, an individual's identity is considered to be rooted in the native or host culture. At a more advanced level the individual's identity is located on a continuum with the two ends reflecting one's native cultural identity and host cultural identity and bicultural identity is believed to be located in the middle; the SL-ASIA scale measures acculturation with this second assumption. The third is a complex understanding which measures native and host cultural identities on two independent and orthogonal dimensions. Berry (1997, 2006) has developed a theoretical model using this approach. According to this model how people acculturate is determined by two factors: "cultural maintenance" – the extent to which people value their cultural identity and strive to maintain it, and "contact and participation" – the extent to which people become involved with other primary groups, or remain primarily involved with others from their native group (Berry, 1997). These factors also shape either of these strategies of acculturation: "assimilation"– individuals do not wish to maintain their cultural identity and seek daily interaction with others; "separation"– individuals wish to hold on to their culture and do not wish any interaction with others; "integration"– individuals are interested in both, maintaining their own cultural identity and also interacting with others; "marginalization",

individuals have little interest in maintaining their cultural identity and also little interest in interacting with others. The strategies used by people are associated with the pattern of psychological acculturation involved in negotiating the demands of the two cultures. The psychological difficulty experienced also corresponds to difficulty experienced in dealing with the demands of adjusting to the two cultures. With minimal demands that can be managed people make a behavioral shift and the outcome is that of assimilation; when the level of conflict is greater but manageable, people experience acculturative stress and take time to assimilate. When the problems involved in acculturating are overwhelming and cannot be dealt with successfully, people may experience debilitating stress levels, personal crises, anxiety and depression. The model also suggests a role for different factors that moderate the process of psychological acculturation. Pre-acculturation moderating factors include demographic factors (age, gender, education and religion), health, language, economic status, motivations for migration (whether pushed from one's culture or attracted to a new culture) and related expectations and cultural distance (the dissimilarity of the two cultures). Factors that moderate during the process of acculturation include duration of time spent in the new culture, social support, societal attitudes, coping strategies and acculturation strategies used by the people.

Salant and Lauderdale (2003) reviewed studies on acculturation and health in Asian immigrant populations and noted the different approaches used to measure acculturation. According to this review acculturation is measured with theory based scales that typically use measures of language use and proficiency, social contacts or relationships and cultural participation and non-scale indicators such as time since immigration, birthplace, language, and degree of Westernization used either individually or in combination. Findings of this review showed that acculturation measured with scales has yielded inconsistent results; some studies show that acculturation is inversely related to mental health while others reveal a

positive association. The reviewers also noted that non-scale measures often lack explicit theoretical model and specific indicators can have complex relationship with acculturation and health which can vary across diverse ethnic groups.

2) Acculturation and Health of South Asian Immigrants

Empirical evidence suggests that SAs' sense of identity is challenged in the process of adjusting to the U.S. lifestyle. In a qualitative study Inman, Howard, Beaumont & Walker (2007) explored the challenges faced by 16 AI parents with origins in a Southern Indian state who had immigrated between the 1960s and 70s in young adulthood (age 21 to 35). These parents were bicultural and had made efforts to retain their identity. They affirmed their core identity by ascribing to cultural values such as preferring intracultural marriages, being family oriented and maintaining vegetarianism and engaging in cultural activities. However, in retaining their identity they experienced challenges such as American society's lack of interest in traditional Indian practices and culture, loss of family guidance and cultural continuity and inability to have the best of both cultures.

In the U.S. each wave of SA immigrants has faced different challenges. Using data from case studies with Asian Indian elderly and on the basis of existing literature Nandan (2007) compared adaptation challenges faced by three waves of SA immigrants who immigrated after 1965. This analysis revealed that most immigrants from the first wave (1965-75) have adapted well in the mainstream of American society and do not have strong ties with families and friends in India; immigrants from the second wave (1976-1985) retain a bi-cultural identity and have ties with their families back in India. The third wave (1990-1999) consists of parents and siblings of dependent immigrants who are not so highly educated. Whether people from this wave face difficulties in adapting to life in the U.S. depends on the reasons for their immigration; those who feel uprooted from their culture face difficulties in adjusting to a totally different culture. Also, those who have immigrated in the

latter half of their lives, particularly women, are likely to experience loneliness due to inadequate emotional and social support along with the challenge of adjusting to a new culture. People from this wave also suffer from chronic age-related health problems; health-related costs can be very burdensome on the caring families as many dependent immigrants are not eligible for public health services until they complete five years of residency in the U.S..

Adherence to SA cultural values appears to be an important determinant of mental health of SA immigrants. A study with aging people (age above 55) in Canada examined the role of different determinants of depression, namely socio-demographic variables, physical health variables and cultural variables which included acculturation-related variables such as length of residence in Canada, English competency and cultural values (Lai & Surood, 2008). This study found that 21.4% of the 210 people in this study were at least mildly depressed. In multivariate analysis, after adjusting for socio-demographic and physical health related factors, the only factor that predicted depression was SA cultural values; people with stronger SA values were 2.9 times more likely to be depressed than others. Anand and Cochrane (2003 cited by Anand & Cochrane, 2005) reported similar findings from their study of British SA women from five large cities in the UK. In this study women who utilized acculturation strategies of "rejection" and "integration", perceived higher levels of prejudice from mainstream society and identified with more aspects of their culture of origin were more likely to suffer from psychological distress, particularly depression.

Cultural identity and values are important determinants of distress and conflict for SAs in the U.S. as well. More than half (58%) of 264 Indo-American parents in a study identified themselves as Indian compared to 27% of the 225 students. Parents in this study reported clash with students regarding values related to dating and mating/marriage preferences – the most important source of intergenerational conflicts and psychological

distress (Kar, Campbell, Jimenez & Gupta, 1995). Among SA adolescents acculturative stress is likely to be in the range of low to moderate levels and social support may play a protective role (Thomas & Choi, 2006) and perception of prejudice could be an important aspect of acculturation related to depression among SA international students (Rahman & Rollock, 2004).

As the sense of identity is challenged in the process of immigration, the actual experience of living on a day-to-day basis in a different social context can be quite stressful for many SAs. South Asian women who had stayed in Canada for an average of one and half years were asked in focus group discussions to express their opinion about a women-specific health issue that was of major concern (Ahmad, Shik, Vanza, Cheung, George & Stewart, 2004). For these women their compromised mental health was a major concern which they described in different terms such as "stress", "tension", "loneliness", "depression" and "doing nothing". They attributed this to the mechanistic lifestyle in Canada and identified several stressors including loss of social support, economic uncertainties, downward social mobility, mechanistic lifestyle, barriers in accessing health services and climatic and food changes. Another Canadian study that compared first and second generation SAs revealed that more in-group hassles, that is stress arising out of contact with one's ethnic groups (e.g. stress due to people from a person's ethnic group not understanding the person's use of native language or the person not being well linked to members of his/her ethnic group) is associated with greater levels of depression (Abouguendia & Noels, 2001).

Addressing different aspects of acculturation and mental health, Mehta (1998) conducted a study to understand whether acculturation was more important than several social and demographic factors in predicting mental health of SAs in the U.S.. Mehta studied the relationship between acculturation and mental health among 195 Indian immigrants in the U.S. by using multiple measures of acculturation including perception of acceptance (contact

experiences with dominant culture), cultural orientation (social and cultural American ties) and cross-cultural skills (language usage) and mental health including psychophysiological symptoms, acculturative stress and life satisfaction. In this study the scores on mental health measures were significantly correlated and so a composite outcome was derived from the measures of mental distress and then reverse scored to indicate mental health. The findings of this study showed that after controlling for social (years in the U.S., years of U.S. education and pre-migration adjustment) and demographic factors two aspects of acculturation were significantly associated with mental distress. The perception of acceptance and an American cultural orientation were positively associated with mental health and explained 19% and 28% of the variance respectively; language usage was not a significant predictor, possibly because all respondents were proficient in English.

In summary, empirical evidence suggests that acculturation is associated with mental health of SA immigrants; people who are more acculturated are likely to have better mental health. This evidence also suggests that different aspects such as generation, wave and acculturation identity are important determinants of mental health of SA immigrants. However, this evidence has several limitations: it comes from few studies, most studies are qualitative and hence findings cannot be generalized, most studies are conducted with immigrants from India and due to the diversity within Indians on account of different ethnicities, languages and religions their potential for generalization is further limited.

b. **Social Support for South Asian Immigrants**

With multiple conceptualizations and a vast body of research, definitions of social support abound. A metasynthesis of qualitative and linguistic studies on social support described social support as "[a]n advocative interpersonal process that involves the reciprocal exchange of information, is context specific, and results in improved mental health" (Finfgeld-Connett, 2005, p. 8). As early as 1985, Cohen and Wills provided empirical

evidence for two models explaining how social support influences mental health of people, namely the main-effect model and the stress-buffering model. According to the main effect model having social support is beneficial to an individual regardless of whether the individual is experiencing stress. On the other hand, stress buffering model explains that individuals under stress have negative mental health outcomes in the absence of social support and positive mental health outcomes in the presence of social support. Over the last three and half decades these models have considerably influenced the research on social support and mental health.

Empirical evidence indicates that social support can provide protection from the psychological distress associated with migration in the general population (Tai-Ann Cheng & Chang, 1999). While a simple understanding of the benefit of social support for a person's mental health is intuitively appealing, research has provided a nuanced understanding of social support. Several aspects of social support have been studied: time (short term and long term); timing (when); relationship and social ties (structure, strength, type, nature); supportive resources (emotional, material, skill or labor, time, cognitive, information, feedback); intentionality of support ; impact of support (positive or negative); recognition of support need; perception of support; actual support; satisfaction with support; characteristics of recipient; and characteristics of provider (Williams, Barclay & Schmied, 2004).

Among SAs the sense of support can change after immigration. In their native countries many SAs derive support in their day-to-day life from interactions with extended family members and close social ties with people. South Asian women in Canadian studies reported that this changed after immigration (Ahmad, Shik, Vanza, Cheung, George & Stewart, 2004; Choudhry, 2001). They attributed their stress, loneliness and feelings of depression to the loss of daily interactions with extended families and social activities, unfriendly neighbors and for women in one study not knowing English made it more difficult

to socialize and garner support in a new environment (Choudhry, 2001). This sense of loss of social support is likely to be greater when the SA immigrants feel "uprooted" from their social environments and are being placed into an entirely different environment (Choudhry, 2001; Desai & Codelho, 1980 cited by Nandan, 2007). South Asian men are also likely to experience this loss of support. A study that compared SA and white men in the UK found that SA men had slightly larger social networks but poorer emotional support and higher levels of scores on a measure of depression (Williams, Kooner, Steptoe & Kooner, 2007).

Whether the loss of social support leads to health and mental health problems among SAs is not researched adequately. Furnham and Sheikh (1993) examined the gender and generational correlates of mental health in Indian and Pakistani migrants to Britain. In this study, as expected, women had greater levels of psychological distress than men. However, there were no differences between men and women with regard to the association of social support and psychological distress. For the whole group, that is men and women together and first and second generation together, certain indicators of social support such as parents living in a country of origin rather than in Britain, turning to a priest or doctor in times of crisis rather than a friend or the spouse, and belonging to a social rather than a national club increased the likelihood of psychological distress. A more recent study conducted with Asian Indians 50 years and older who had lived for more than five years in a southeastern state of the U.S. revealed that social support may not be associated with mental distress (Diwan, Jonalgadda & Balaswamy, 2004). In this study social support was measured with a single item about satisfaction with friendships and was associated with positive affect (measured with two items on happiness and enjoyment in life) but not negative affect on a measure of depression, namely, the Center for Epidemilogical Studies – Depression Scale (CES-D). This finding is not very convincing because of the weak measures of social support and positive affect.

While there is little research on social support among SA immigrants, currently available research establishes that SAs are likely to have lower social support. This research challenges a widely held notion that being from collectivistic societies SAs are likely to have more support from their social networks and families. This research also suggests that social support is an important aspect associated with mental health of SA immigrants.

c. Acculturation and Social Support

Theoretically social support is conceptualized as a moderator of the process of acculturation (Berry, 1997; 2006). While the relationship of acculturation and mental health of immigrants has been studied, possible explanatory mechanisms underlying this association have not been researched adequately (Shen & Takeuchi, 2001). However, a few studies with different immigrant populations such as Chinese Americans (Shen & Takeuchi, 2001), Korean international university students in the U.S. (Lee, Koeske & Sales, 2004) and immigrant students in Norway (Oppedal, Røysamb & Sam, 2004) suggest that social support does play a salutary role and protects the mental health from stress arising out migration. In the study of Chinese Americans (Shen & Takeuchi, 2001) acculturation was associated with socio-economic status, which in turn was associated with greater depressive symptoms. In this study social support mediated the association between socio-economic status and depressive symptoms such that in the presence of better social support depressive symptoms were lower despite higher socio-economic status. In the study of immigrant students in Norway (Oppedal, Røysamb & Sam, 2004) social support of different types (from family, friends and classroom) played the role of moderating and mediating the effect of ethnic (native) and host cultural competence on mental health. Among Korean international students in the U.S. (Lee, Koeske & Sales, 2004) social support buffered the effect of acculturative stress on mental health symptoms; specifically social support reduced the negative effect of high acculturative stress on mental health symptoms.

Only one study conducted with Korean and Asian Indian adolescents in the U.S. has examined whether social support was negatively associated with acculturative stress (Thomas & Choi, 2006). As expected, social support was indeed negatively associated with acculturative stress. Among different types of social support included in this study, namely, support from friends, parents, organizations, religious activities and cultural activities, only support from parents was a significant negative predictor of acculturative stress among both Korean and Asian Indian adolescents. Studies with adult SA immigrants have not examined whether social support influences the relationship of acculturation to mental health. However, the need for social support after migration as reported in qualitative studies (Ahmad, Shik, Vanza, Cheung, George & Stewart, 2004; Choudhry, 2001) suggests that if available, social support may offset the negative effects of a lesser degree of acculturation on mental health of SAs.

D.   Utilization of Health Services for Common Mental Disorders

Though people with anxiety and depression suffer from mental distress, only a few utilize health services. A study analyzed data from the National Comorbidity Survey-Replication (NCS-R) study and reported prevalence of 12-month health services use from the mental health specialty sector (MHS) and the general medical sector (GMS); MHS included services provided by different mental health providers and GMS included services provided by non-mental health providers such as general physicians and nurses (Wang, Lane, Olfson, Pincus, Wells & Kessler, 2005). This study's findings showed that among anxiety disorder patients 21.7% utilized services from MHS and 24.3% from GMS, and among patients who suffered from any mood disorder, the of use services from both sectors was around the same (32.9% from MHS and 32.8% from GMS).

Empirical evidence also indicates that the American health service system fosters people's use of general health services rather than mental health services for mental health

needs. For example, between 1990-92 and 2001-2003, for mental health problems, use of general medical services only (i.e. not including services accessed from psychiatrists alone or services provided together by general health providers and non-psychiatrist mental health providers) increased by 153% as compared to 74% increase in the services provided together by general health providers and non-psychiatrist mental health providers and 29% increase in the services provided by psychiatrists alone (Wang, Demler, Olfson, Pincus, Wells & Kessler, 2006).

An aspect related to utilization of health services for CMD is that depressed and anxious people may use general health services for somatic complaints and not for mental health problems. To examine whether somatization confounds the association between CMD and use of general health services, Koopmans, Donker & Rutten (2005) reviewed 12 population based prospective studies that assessed for somatic and mental health status before the follow-up period and also adjusted for possible confounding by somatic variables. Their findings confirmed that CMD were associated with higher use of general health services. Common mental disorders were positively associated with use of medical services of any kind, expenditure on general health care and number of health care contacts, and also with utilization of outpatient health services in five of the eight studies that had outpatient health services as outcome variables.

Though CMD are independently associated with utilization of general health services, the importance of somatization in the use of general health services cannot be understated. Around 70-90% of primary care patients with depression and anxiety report with somatic complaints (Simon, Von Korff, Piccinelli, Fullerton & Ormel, 1999), and at least 33% of somatic symptoms in primary care remain medically unexplained (Kroenke, 2003). Barksy , Orav & Bates (2005) studied health service utilization of primary care patients and found that somatizing patients had around two times higher utilization of inpatient and outpatient

medical care. Also, somatization continued to be a significant determinant of utilization of

medical services even after controlling for service utilization for anxiety and depression.

In light of the above research it is evident that few people with CMD may use mental

health or general health services and that all the three related distress indicators of depression,

anxiety and somatic complaints are important reasons for seeking services. This may

however be different for SAs in the U.S. because as immigrants their utilization of health

services is influenced by several other factors.

1.   Health Service Utilization of South Asians

As Asians in the U.S. have lower rates of mental health problems (Sue & Chu,

2003) their utilization of services for these problems is expected to be less than majority

Americans. However, these lower rates disguise the differences between different groups due

to the heterogeneity among Asians (Sue & Chu, 2003). For example, a California based

study on utilization of mental health services (measured as use of outpatient and inpatient

services and outpatient minutes) found that though the most common diagnosis among Asian

Americans was depression, for Filipinos, schizophrenia was more prevalent than depression.

Furthermore, it was the East Asians who used mental health services most, even after

controlling for severity of mental illness (Barreto & Segal, 2005).

South Asians also may be using mental health services to a lesser extent than other

Asian groups. A Houston-based unpublished dissertation study found that though depression

was the most prevalent diagnosis among three Asian groups, namely, Vietnamese, Chinese

and Asian Indian, Asian Indian and Chinese utilized mental health services less than the

Vietnamese (Chuang, 2004). Some studies in the U.S. and UK suggest possible reasons for

underutilization of mental health services by South Asians. These reasons include an unmet

need for mental health services (Khan, 2006), reliance on friends and families for mental

health problems (Commander, Odell, Surtees & Shashidharan, 2004), general practitioners

not diagnosing CMD correctly and overvaluing somatic symptoms among SAs (Bhui,

Bhugra, Goldberg, Dunn & Desai, 2001), SAs not being referred to specialist mental health

service providers (Bhui, Stansfeld, Hull, Priebe, Mole & Feder, 2003) and SAs seeking

treatment only when the psychological symptoms are severe and thus delaying treatment

(Conrad & Pacquiao, 2005).

Though research conducted to date does not provide an estimate of how many SAs in

the U.S. utilize mental health or health services, it suggests that several factors may influence

utilization of health services. According to the pooled data from National Health Interview

Survey (1992, 1993 and 1994) several factors are significantly associated with AI's

utilization of health services – age, education, living with spouse and family income are

negatively associated with health service utilization and sex (being a male), duration of stay

in U.S., having health insurance, better self assessed health status, number of health

conditions and bed days are positively associated with health service utilization (Ryu, Young

& Kwak, 2002). Other research also suggests that socio-demographic and socio-cultural

factors also influence SA's utilization of health services. In the following sections research on

such factors that are relevant to the current study is summarized.

a.   Beliefs About Mental Illness and Stigma

Drawing from the traditions of Ayurveda and Unani Tibb SAs may not

solely adhere to distinction between the illnesses of the mind and the body and their holistic

approach can partly influence both the acknowledgment of mental distress and the nature of

help sought for such distress (Weiss, Desai, Jadhav, Gupta, Channabasavanna, et al., 1988).

Research in this area suggests that SAs may not seek treatment when they experience

psychological distress as they consider it inappropriate to talk about it to doctors and prefer

resolving the difficulty with self-help or with assistance from family members (Furnham &

Malik, 1994; Hussain & Cochrane, 2002; Karasz, 2005; Malik, 2000;). Among SAs

traditional beliefs about health and illness may also include beliefs in supernatural causation and chance factors. Fazil & Cochrane (1998, cited by Hussain & Cochrane, 2002) found that SAs had a belief that mental illnesses are incurable. Negative beliefs about mental illnesses (such as the belief in incurability) have not been explored adequately in research with SAs. In a study with Gujarati SA immigrants in UK though these beliefs were not the most important explanations, they held a place along with other common explanations such as psychological factors, self-responsibility (taking responsibility for one's health) and physical vulnerability (Jobanputra & Furnham, 2005). Research with Asian students (Hirai & Clum, 2000) and older people (Segal, Coolidge, Mincic & O'Riley, 2005) also indicates that the negative beliefs such that mental illnesses are incurable and that mentally ill people have poor interpersonal and social skills are associated with a preference for no treatment and a preference for folk medicine.

Another negative view that is universally associated with mental illnesses and hinders utilization of services is the stigma associated with mental illnesses (Thornicroft, 2008). As a consequence of stigma family-oriented SAs prefer to deal with mental illnesses within the bounds of the family and do not want their mental health problems to be known within their own community as well (Cinnirella & Loewenthal, 1999). However, this does not imply that SAs seek services from other professionals who may not be from their community. Evidence suggests that they may not openly acknowledge the existence of mental illnesses and seek health services. For example, in a UK based study that aimed to understand the influence of traditional cultural values, SA women perceived that seeking help from mental health professionals symbolized shame, dishonoring the family and breach of confidentiality (Gilbert, Gilbert & Sanghera, 2004). In this context, findings of an Indian study are informative. This study found that stigma is associated with psychological symptoms that were personal and known only to the individual, but not with somatic symptoms which are

similar to physical symptoms experienced by many other people (Raguram, Weiss, Channabasavanna & Devins, 1996). Such a perception can explain why somatization could be an important factor in influencing utilization of health services.

b. **Somatization**

It is increasingly recognized that somatization needs to be treated at par with anxiety and depression as several people seek health services for somatic symptoms (Kroenke, 2000). Studies in India and Pakistan also indicate that many people suffering from CMD may present with somatic symptoms in primary care settings (Minhas & Nizami, 2006; Patel, Pareira & Mann, 1998). Therapists dealing with mental health problems of SA immigrants commonly encounter somatic symptoms such as headache and stomach pains as presenting problems (Almeida, 1996).

Research that has explored somatizaiton among SAs has primarily been exploratory and qualitative (e.g Karasz, Dempsey & Fallek, 2007; Malik, 2000) and has not explored the association between somatization and utilization of mental health services or general health services in the U.S.. Even so, evidence from the UK suggests that somatization is an important factor in utilization of health services from the perspective of the patient and the provider. Bhui, Bhugra, Goldberg, Dunn. & Desai (2001) conducted a study with British and Punjabi SA patients and compared the general practitioners' assessment of somatic symptoms with assessment done with a research instrument. They found that for Punjabi South Asian patients general practitioners assessed somatic symptoms in excess of those identified by the research instrument and this led to inaccuracies in diagnosis of common mental disorders. This study also found that though among SA Punjabis seeking help for CMD, for around one-third (30.9%) general practitioners was the first source of help.

Research with other immigrant groups in the U.S. also indicates that somatization predicts utilization of health services. A Canadian study revealed that Ethiopians in Canada

were one and half times more likely (OR = 1.51) to utilize mental health services if they had somatic symptoms, but if they had mental disorders, they were significantly less likely to utilize mental health services (OR = 0.784) (Fenta, Hyman & Noh, 2006). Consistent with this finding, in a U.S. based study of Chinese Americans, those suffering from depression and anxiety were 94% and 87% less likely than those suffering from a somatoform disorder to seek professional help (Kung & Lu, 2008).

c. **Acculturation**

There is a paucity of research on association between acculturation of SAs and their utilization of health or mental health services. With regard to utilization of services, difficulties involved in acculturating can include language barriers, not knowing where and how to access services and an environment of non-receptive health service system. Additionally, the distinct cultural differences can lead to difficulties in accessing services from health professionals who may not be familiar with the SA culture. For example, doctors and other health providers trained in the U.S. may not be culturally sensitive in addressing issues of SA women who are likely to be uncomfortable sharing about their personal lives. As a consequence SAs may not prefer seeking formal health services and utilize informal health services.

The scant research with SAs in this area does however indicate the existence of such barriers. For example, in the Canadian study by Ahmad, Shik, Vanza, Cheung, George & Stewart (2004) SA women experienced difficulties accessing services because of the long waiting periods to see specialists, an environment unfamiliar in the SA countries where health services can be accessed with relative ease from private health service providers. Consistent with this in the U.S., Kar, Campbell , Jimenez & Gupta (1995), based on both quantitative and qualitative information acquired from multiple sources, reported that many SAs in their study were dissatisfied with their interactions with their doctors and nurses and unhappy

about the time spent by their doctors. In another study Chinese Americans who perceived bad or unfair treatment from service providers because they spoke in a different language or with a different accent were 2.2 times more likely to use informal services and 2.4 times more likely to seek help from friends or relatives compared to those who did not perceive such treatment (Spencer & Chen, 2004). Research also suggests that another indicator of acculturation, namely, the duration of stay in the U.S. is an important predictor of health and utilization of health services by Asian Indian immigrants (Ryu, Young & Kwak, 2002).

Summarily, the above research implies that acculturation can be associated with SAs' utilization of health services. In particular, as many of the SAs from third generation do not have high educational background (Nandan, 2007), their difficulty with English language may pose an important barrier in accessing services in addition to the constraints imposed by the health service system in the U.S.

d. Social Support

Research on social networks of individuals and their help seeking provides insights as to how social support is associated with utilization of health services. The underlying assumption is that an individual derives social support from his/her social networks. As early as 1978 four hypotheses were proposed to explain the association between social networks and use of health services: a) networks buffer the experience of stress and so obviate the need for help, b) networks provide instrumental and emotional support which substitutes for professional assistance, c) network members screen problems and refer them to professional services, d) networks transmit attitudes, values and norms for help seeking (Gourash, 1978 cited by Albert, Becker, McCrone & Thornicroft, 1998, p.260).

Evidence suggests that social support is negatively related to use of health services. A review of studies on utilization of mental health services by people with severe mental illnesses found that in most studies smaller social network and lesser degree of social support

is associated with increased risk of frequent hospitalization (Albert, Becker, McCrone & Thornicroft, 1998). This evidence lends credence to the first two hypotheses mentioned above. However, more recent research highlights other aspects that can play role in influencing the association of social support with health services utilization. A study on non-English and non-French speaking immigrants in Canada found that health service utilization was determined by immigrants' social network characteristics (Deri, 2005). For some immigrant groups living in an area with high concentration of people speaking the same language increased utilization of health services suggesting that information sharing increases access to services. However, for other immigrant groups living in an area with high concentration of people speaking the same language did not increase utilization suggesting that norms of the immigrant group influence service utilization more than their social network.

Among Asians also cultural norms are important. Research shows that compared to European Americans, Asians, including Asian Indians, may not openly seek support as they are concerned about negative relational consequences. They are less willing to seek support from others because they are concerned that they may lose status, disrupt group harmony and get criticism from others (Kim, Sherman & Taylor, 2008). While research explains why Asians may not seek support, there is little research that has explored whether social support predicts service utilization among South Asians. One unpublished study with 207 Indians and Pakistanis in the U.S. and Canada found that for South Asians not having social support from family was associated with seeking help from a mental health care provider (Holmes, 2006). Consistent with cultural norms and the importance of family, in one study with depressed SAs in the UK, family was the valued source of support and not other health services (Lawrence, Murray, Banerjee, Turner, Byng, et al., 2006). These studies indicate that South

Asians may not make efforts to increase their social support or network which could help them get information and access health services for their mental health problems.

e.   **Insurance**

Insurance can be an important factor associated with utilization of health services among immigrants in the U.S.. In a comparative study on utilization of preventive and non-preventive care among U.S. born adults and immigrants, Xu and Borders (2008) found that U.S. born adults had significantly greater utilization of both types of health care. Additionally, a significantly higher proportion of immigrants than U.S. born adults believed that they did not need health insurance (12.03% vs. 8.51%) and compared to immigrants, significantly higher proportion of U.S. born adults believed that they could overcome illness without medical help (22.30% vs. 17.71%). This suggests that immigrants may not acknowledge the need for health insurance and under-utilization or non-utilization of health services may be associated with not having health insurance. Furthermore, a greater proportion of non-U.S. citizen immigrants (43.6%) do not have health insurance as compared to immigrants who have become U.S. citizens (18.5%) (Carrasquillo, Carasquillo & Shea, 2000).

Research also shows that immigrant status predicts health insurance coverage and health insurance coverage in turn predicts utilization of health services. Choi (2006) hypothesized that health insurance mediates the relationship between health service utilization and immigrant status. To this purpose Choi studied health service utilization among newly arrived older immigrants (NOIs; immigrants who have resided in the U.S. for less than five years) and analyzed data from the National Health Interview Survey (NHIS) of 2000, in which the measures of health service utilization were hospitalization over a period of 12 months and physician visit over a period of two weeks. Results of this study showed that among people who had insurance the odds were four times higher for using inpatient hospital

services and 3.31 times higher for physician visits as compared to those who did not have health insurance. The study's results also confirmed that immigrant status was independently related to not having health insurance; NOIs were 31 times more likely to be uninsured than non-NOIs. This indicates that NOIs are more likely not to use health services because they are not insured.

Within immigrant groups the rates of not having health insurance vary for different groups. In general, Asians have higher rates of insurance than other immigrant groups. According to the U.S. census data for 2006 a greater percentage of Asians (15.5%) did not have health insurance compared to 10.8% non-Hispanic Whites (DeNavas-Walt, Proctor & Smith, 2007). However, compared to Whites, Asian Americans and Pacific Islanders (AAPI) are also less likely to have job-based insurance. The lack of insurance among Asian Americans is believed to be largely determined by the factors of employment based coverage and citizenship status (Brown, Ojeda, Wyn & Levan, 2000). Also, there is growing realization that different groups within Asians need to be studied separately because these groups are not homogenous and differ in terms of their demographic characteristics, health insurance coverage and years lived in U.S.. These factors may influence their health needs and utilization of health services differently (Ryu, Young and Kwak, 2002).

In 1997 21% of the South Asians in the U.S. were uninsured; this rate was greater than for non Latino White (14%), comparable to Chinese (20%) and Fillipino (20%) and lesser than for Korean (34%) and Southeast Asian (27%). However, the Medicaid coverage among South Asians (4%) was only marginally lesser than for non Latino Whites (6%) (Brown, Ojeda, Wyn & Levan, 2000). A study that analyzed NHIS data for 1992, 93, 94 found that among Asian Indians, of whom only 3.3% were U.S. born, different factors predicted insurance status and utilization of health services. Health insurance coverage was negatively predicted by family size and self-employment and positively predicted by family

income, government employment and years lived in the U.S.. Utilization of health services was negatively predicted by age, education, living with spouse, family income, sex, years lived in U.S., having health insurance, respondent assessed health status and number of health conditions suffered by the individual (Ryu, Young and Kwak, 2002).

The findings of the above discussed studies suggest insurance coverage is one of the factors that influences utilization of health services for mental health problems among South Asians. The importance of health insurance as a predictor is likely to be more in view of the many newly arriving SA immigrants who are older, less educated, and likely to be unemployed or working in small jobs that do not provide health insurance.

E. **Limitations Of Current Research**

Mental health issues of SA immigrants in the U.S. have not been adequately studied because of the myth of the model minority. Much of the research reviewed on SA immigrants' mental health has been conducted in other countries including the UK and Canada. Though this research provides useful insights, it has limited applicability in the American context as SAs' experience of acculturating in the U.S. is likely to be different compared to the UK and Canada. The U.S. based research with SA immigrants (e.g. Karasz, 2005; Inman, Howard, Beaumont. & Walker, 2007), with the exception of few studies including Mehta (1998) and Thomas and Choi (2006) has been done using the qualitative approach to research. This research gives vital information about the processes involved in SAs' acculturation and how different socio-cultural factors may be associated with their mental health and use of health services. However, because these studies were qualitative studies, they do not provide any estimate of the independent effects of these factors. Additionally, most of these studies have been conducted with select populations including women (Karasz, 2005; Karasz, et al., 2007), students (e.g. Thomas & Choi, 2006) and small ethnic groups within SAs (e.g. Inman et al., 2007). Therefore findings from these studies

have limited generalizability. Another glaring gap is the absence of any research on SA's utilization of health services. Research in this area is needed as several factors related to acculturation and socio-cultural factors specific to SAs may impinge on SAs' utilization of health services for mental health problems.

III. METHODOLOGY

This study analyzed data from the South Asian Health Descriptor Study (SAHDS), a cross-sectional survey conducted with SA immigrants in Chicago. The purpose of the SAHDS was to describe predisposing and enabling factors related to cancer screening, HIV prevention and testing, alcohol use and mental health treatment seeking among SA immigrants.

Three hundred and thirty one participants were recruited from May 2008 to November 2008 at three Chicago-based community based agencies that provide health-related and other social services to SA immigrants, namely, Metropolitan Asian Family Services, Indo-American Center and the Humdard Center. These participants were sampled using a purposive sampling strategy and were recruited in the study if they fulfilled the following criteria: a) the respondent had to be of SA origin, that is the respondent had to be born in a SA country including India, Pakistan, Bangladesh, Nepal and Burma, b) the respondent's age had to be forty years or more and c) the respondent had to be able to speak and read either of the three languages, namely English, Hindi or Gujarati. The staff at the three agencies contacted potential families seeking services from their agencies and also advertised the study in their offices using flyers. Interested participants were scheduled for interviews by trained interviewers of the study. The response rate in this study was approximately 98%.

For the purpose of SAHDS questionnaires were translated from English to Hindi and Gujarati using the modified committee approach translation method (Harkness & Mohler, 2002). A committee of three translators was formed for each Hindi and Gujarati translation. Each committee member translated one-third of the questionnaire and subsequently committee members together reviewed each member's translation and consensually decided upon the translation of each item in the questionnaires. Translated questionnaires were then

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pilot tested with 10 respondents and modified to achieve clarity and better participant understanding.

A.   Study Design

This descriptive and correlational study involved secondary analysis of data on mental health related variables and other psychosocial variables from the SAHDS. The entire sample of the SAHDS was used in this study's analysis.

B.   Measurement

1.   Demographic Variables

The demographic variables of country of origin, language of interview, religion, employment status and marital status were measured at the nominal level. These variables were used in descriptive analysis to understand the profile of the sample. Additionally, demographic variables that were included in both descriptive and multivariate analysis were gender, years of education, employment status, age and monetary resources. Of these variables, gender and employment were measured at the nominal level, years of education was measured at the ordinal level and age and monetary resources were measured at the interval level. The variable of monetary resources was computed using the "money" subscale of the Family Resources Scale (FRS; Dunst & Leet, 1985).

The money subscale of the FRS has 5 items that were rated on a 4 point rating scale ranging from "not at all adequate" (1) to "almost always adequate" (4). The scale also allowed participants to not respond to an item if it was not applicable to their family. The psychometric properties of the entire FRS (30 items) were originally established in a study of mothers of preschool children (Dunst & Leet, 1985). Recently Van Horn, Bellis & Snyder (2001) revised the FRS after testing its psychometric properties in a national sample of low-income families. They suggested different subscales for the FRS which included the money subscale that had a reliability of .81 and .83 for the cohorts of families with kindergarten and

third grade children. The money subscale was scored as recommended by Van Horn, Bellis & Snyder. A mean score on this subscale was computed with higher score indicating greater adequacy of monetary resources for the family.

2. Moderator Variables

The demographic variables of gender, education and monetary resources were treated as moderating variables in this study.

3. Control Variables

a. Self-reported Health Condition

The subjective report of health condition was measured using a single question in the SAHDS. The participants assessed their health status on a five point scale ranging from "poor" to "excellent". The score on this question was used as a measure of self-reported health condition and controlled for before analyzing the influence of different psychosocial factors on use of health services.

b. Diagnosed Health Conditions

Diagnosed health conditions were controlled for in this study while examining the role of different predictors of utilization of health services. Using questions from the SAHDS a variable was created to measure the number of health conditions that the respondent has reported to be diagnosed by the doctor. Five different health conditions were included: cancer of any type (breast, cervical, colorectal), diabetes, heart attack, high blood pressure and stroke. The variable was computed as an index at an interval level such that a respondent having none of the diagnoses had a score of zero and respondent having all diagnoses had score of five.

4. Independent Variables

a. Acculturation

Acculturation was measured using three variables.

1) Cultural Identity

Cultural identity was measured by adapting the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA scale; Suinn, Ahuna & Khoo, 1992). The SL-ASIA measures acculturation uni-dimensionally, that is an individual's identity is measured on a continuum of Asian and Western identity. The original SL-ASIA has 21 multiple choice questions and five factors: a) reading/writing/cultural preference, b) ethnic interaction, c) affinity or ethnic identity and pride, d) generational identity, and e) food preference. Each question has five response options that are worded to measure acculturation on a continuum of low acculturation (reflecting high Asian identity) to high acculturation (reflecting high Western identity). A total score is computed and divided with the number of items to yield a score in the range of one to five with one indicating Asian cultural identity, three indicating bicultural identity and five indicating Western identity.

This scale was originally validated by Suin, Ahuna & Khoo (1992) with 324 Asian American university students. The scale was found to be internally consistent (Cronbach's alpha = .91) and concurrent validity of the scale was measured by correlating it with different demographic factors such as total years attending school in the U.S. (r = .61), age upon attending the school in the U.S. (r = -.60), years living in the U.S. (r = .56), age upon arriving in the U.S. (r = -.49), years lived in non-Asian neighborhood (r = .41), and self-rating of acculturation (r = .62). Subsequent to its original validation, the SL-ASIA has been widely used in research with different Asian American communities. In a review of studies using the SL-ASIA, Ponterotto, Baluch & Carielli (1998) reported that the SL-ASIA has satisfactory internal consistency with alphas in the range of .68 to .90 and strong convergent validity with related measures such as of self-identification and length of time living in the U.S..

In the SAHDS the SL-ASIA items were adapted to make the scale suitable for use with SAs. The changes included use of the terms "South Asians", "India, Pakistan,

Bangladesh, etc." and relevant SA languages wherever appropriate. The SAHDS used 20 of the original 21 items from SL-ASIA. The item excluded asked "What generation are you?" and provided response options that ranged from "1 = I was born in Asia or country other than U.S." to "5 = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.". This item was excluded because only SAs not born in the U.S. were eligible to participate in the study. The new 5 items suggested by Suinn were not included in the SAHDS. In this study the adapted SL-ASIA was scored by dividing the total score by 5; a higher score signified higher acculturation to the Western culture.

2)   Duration of Stay in U.S.

In this study having stayed in the U.S. for a greater number of years was considered to be indicative of a higher level of acculturation. This variable was measured at the ordinal level by creating a variable from the question that measured respondent's duration of stay in the U.S. with four response options: "less than a year" (1), "1-5 years" (2), "6-10 years" (3) and "more than 10 years" (4). In analysis this variable was recoded into three categories: less than six years, six to ten years and more than ten years. In multivariate analysis the category of less than six years was used as a reference category.

3)   Fluency in English

The SL-ASIA has two items related to respondent's use of language with friends and neighbors. However, these items do not specifically ask about the respondent's ability or comfort in understanding and speaking English. Therefore, the SAHDS included two questions that asked whether the respondent spoke and understood English. These questions were measured with a 3 point Likert scale ranging from "not at all" (0) to "well" (2). In this study an index was created using these two questions by adding scores on the two questions; a minimum score of zero indicated no fluency in English and the maximum possible score of four indicated high fluency in English.

b. <u>**Social Support**</u>

Social support was measured with the Sense of Support Scale (SSS; Dolbier & Steinhardt, 2000). This scale measures an individual's perception of the amount of available social support and its qualitative aspects. The scale items measure quantity of support with regard to relationships and ties with family, friends, neighbors, coworkers, clubs and quality of support with regard to function served by different relationships and their importance to the individual.

The SSS was constructed for use in measuring the influence of social support on one's health and has 21 items. These items are measured on a four point Likert scale ranging from "not at all true" to "completely true". The psychometric properties of this scale were tested in two studies involving corporate executives and university students and the scale was demonstrated to have good reliability (Cronbach's alpha = .86 and test-retest alpha = .91). The validity of the SSS has been established with different measures: concurrent validity with two measures of social support (Social Provisions Scale ($r = .72$) and Interpersonal Support Evaluation List ($r = .78$)); convergent validity with a measure of hardiness ($r = .58$) and approach-coping ($r = .57$); divergent validity with avoidance coping ($r = -.46$), perceived stress ($r = -.40$) and symptoms of illness ($r = -.32$). In this study a mean score on all items was computed; higher mean score indicated greater social support.

c. <u>**Negative Beliefs About Mental Illness**</u>

Negative stereotypical beliefs about mental illness were assessed using two subscales of the Beliefs Toward Mental Illness Scale (BTMI; Hirai & Clum, 2000). The BTMI scale has three factors measuring negative beliefs: people with mental illnesses are dangerous, mental illnesses are incurable and people with mental illnesses have poor interpersonal and social skills. Each item in this scale is measured on a six point Likert scale ranging from "completely disagree" (1) to "completely agree" (6).

This scale has been validated with Asian and American college students. The "poor interpersonal and social skills" subscale consisting of ten items (Cronbach's alpha = .84) and the "incurability" subscale consisting of six items (Cronbach's's alpha = .82) were used in the SAHDS. The concurrent validity of these subscales has been established by correlating these scales with a scale on treatment preferences. The subscale on poor interpersonal and social skills correlated significantly with a preference for no treatment (r = .24,) and a preference for folk medicine (r = .27) for both Asian and American students taken together. The subscale on incurability correlated with Asian students' preference for folk medicine (r = .19). For the purpose of this study coefficients of internal consistency were calculated separately for the two subscales. A mean of the total scores on subscales was calculated; higher score indicated more negative beliefs about mental illness.

d.   Stigma

Stigma was measured by adapting the Stigma Scale for Receiving Psychological Help (SSRPH) (Komiya, Good & Sherrod, 2000). The SSRPH is a five item scale designed to assess individual's perception of how stigmatizing it is to receive psychological treatment. Each item is worded to seek individual's opinion about seeking help from a psychologist and is rated on a four point Likert scale ranging from "completely disagree" (1) to "completely Agree" (4). The scale was validated with 311 undergraduate students. It has internal consistency with a Cronbach's alpha coefficient of .72 and its construct validity was established by its correlation with a scale on attitudes toward seeking psychological help (r = -.40).

In the SAHDS the SSRPH was adapted by replacing the term "psychologist" with "mental health practitioner". Before asking the questions in the SSRPH, the interviewers explained that the term "mental health practitioner" included a psychiatrist or psychologist or a counselor. In this study the mean of the total score on the SSRPH was computed; higher

mean score indicated greater level of stigma perceived in seeking help from a mental health practitioner.

e. Insurance Status

In the SAHDS each respondent's insurance status is coded under either of the categories: no health insurance; paying by self for health services; insurance from spouse's employment or an insurance company; Medicare; Medicaid. In the SAHDS the category of "paying by self" was used to categorize people who reported not having insurance and paying from their own pockets for their medical expenses. As there was high collinearity among different insurance categories, in multivariate analysis these categories were collapsed into three groups: respondents with no health insurance, respondents with health insurance (respondents who had insurance from employment/spouse's employment/insurance company/Medicare/Medicaid) and respondents paying by self or using other source of care. The last category was used as the reference category.

1. Dependent Variables

a. Mental Health Outcomes

The three mental health outcomes in this study were depression, anxiety and somatization. The SAHDS used three scales from the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD PHQ) (Spitzer, Kroenke, Williams, & The Patient Health Questionnaire Primary Study Group, 1999), henceforth referred to as the PHQ, to measure these three outcomes. In the original PRIME-MD a person first completes a questionnaire that screens for different mental disorders and then a clinician diagnoses using an evaluation guide; the PHQ is a self-administered version of the PRIME-MD. In its validation with 6000 patients from primary care and obstetrics-gynecology clinics the PHQ had an overall accuracy of 85%, sensitivity of 75% and specificity of 90% for various PRIME-MD diagnoses (any mood disorder, any anxiety disorder, any eating disorder

and probable alcohol abuse/dependence). The PHQ has also been found to be suitable for use

in different countries and recently its suitability was verified in an Indian study (Avasthi,

Varma, Kulhara, Nehra, Grover & Sharma, 2008). In the Indian study, the agreement

between the physician's diagnosis and PHQ diagnosis was 69.6%.

1)   **Depression**

The SAHDs used the PHQ scale on depression, also known as

the PHQ-9 (Kroenke, Spitzer, & Williams, 2001). This scale measures the severity of

depression based on experience of depressive symptoms in the last two weeks. It has nine

depressive symptoms that have to be rated on a four point scale: "Not at all" (0), "Several

days" (1), "More than half the days" (2) and "Nearly every day" (3). Severity of depression

can be determined by calculating the total score which is computed by adding each item's

rating and can range between zero to twenty-seven. Cut-off points for different levels of

severity are: minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19) and

severe (20-27). Major depression and other depressive syndrome can also be diagnosed

according to the algorithms provided by the authors.

In its validation with primary care and obstetrics-gynecology patients, the depression

scale's sensitivity, specificity and overall accuracy was 61%, 94%, and 88% respectively for

any mood disorder and 73%, 98% and 93% respectively for major depressive disorder. It was

reliable (Cronbach's alpha = .89 and a test-retest reliability alpha = .84) and its construct

validity was established by correlating it with 6 domains of functional status (mental, social,

role, general, pain and physical) measured on the SF-20 scales. Greater levels of depression

and depressive symptom scores correlated positively with increase in disability days, health-

care utilization, and symptom related difficulty in activities and relationships. Recently

construct validity of the PHQ-9 in general population was established in a German study

(Martin, Rief, Klaiberg & Braehler, 2006). In this study the total score on the PHQ-9 was

used as a continuous measure and levels of severity, when included in the analysis, were calculated according to the norms given by the scale constructors.

2)   Anxiety

The SAHDS used the PHQ anxiety scale which helps diagnose two types of anxiety disorders, namely panic disorder and other anxiety disorders. In this study the subscale measuring other anxiety disorders was used. This subscale has seven items that are to be rated on a three point Likert scale of "not at all" (0), "several days" (1) and "more than half the days" (2) based on whether an individual has those symptoms in the past four weeks. The scale is to be administered with a skip pattern such that if a person chooses the response option "not at all" for the first item ("feeling nervous, anxious, on edge, or worrying a lot about different things" in the last four weeks) then s/he can skip the other items in the scale. Because the SAHDS was a community based study and it aimed to get as much data as possible, interviewers did not follow the skip pattern and asked the respondents all the seven questions in the anxiety subscale.

In its validation with primary care and obstetrics-gynecology patients, the PHQ anxiety scale's sensitivity, specificity and overall accuracy for any anxiety disorder was 63%, 97%, and 91% compared to the 69%, 90% and 86% in the clinically administered PRIME-MD. The construct validity of the anxiety scale of the PHQ has not been reported separately as it is for depression and somatization scales. However, the construct validity of all the PHQ scales including the anxiety scale has been established with reference to different domains of functioning of the SF-20 scales, number of disability days, health care utilization and symptom related difficulties. In this study a total score on the anxiety subscale was computed and thus each participant in the study could have a minimum score of zero and maximum possible score of 14.

3)   Somatization

Somatization was measured using the somatization subscale of the PHQ, also known as the PHQ-15 (Kroenke, Spitzer & Williams, 2002). It consists of 15 somatic symptoms, 14 of which are the most prevalent DSM-IV somatization disorder symptoms, and provides a continuous measure of somatic symptom severity. The person taking this scale has to rate how frequently a symptom bothered him/her in the previous two weeks on a three point scale of "not bothered at all" (0), "bothered a little" (1) or "bothered a lot" (2). The total score is computed by adding the rating on all items and can be in the range of 0-30. The severity level cutoffs for this scale are 0 - 4 total score (minimal), 5 - 9 total score (low), 10 - 14 total score (medium) and 15 – 30 total score (high).

The internal consistency of the scale for both family practice and obstetrics - gynecology samples of 3000 each was .80. The construct validity of the PHQ 15 was tested by correlating severity levels of the scale with six domains of functional status of the SF-20 scales, self-reported disability days, clinic visits and amount of difficulty globally attributed to the somatic symptoms. Greater levels of somatization were associated with decrease in SF-20 scales, increase in disability days, health care utilization and symptom-related difficulties (Kroenke, Spitzer & Williams, 2002).

This study used the total score on the somatization scale as a measure of somatization. A higher score indicated greater somatization by the individual. When the levels of severity were included in the analysis these were computed as per the cut-offs given by the authors.

b.   Utilization of Health Services.

In this study health services utilization was measured with two variables: mental health services utilization and general health services utilization.

1)   Mental Health Service Utilization

The SAHDS adapted some items from the questionnaire on mental health service utilization in the National Latino and Asian American Study (NLAAS;

Collaborative Psychiatric Epidemiology Services, n.d.). Two of these questions were about whether an individual visited a mental health practitioner (psychiatrist / psychologist / psychiatric nurse / social worker / counselor) or other medical doctor (a physician / family doctor / other specialist for mental health problems in the last 12 months. The response categories for these questions were "Yes" and "No". In this study, these questions were used to compute a dichotomous variable of mental health service utilization. On this variable people who had utilized mental health services from a mental health practitioner and/or a medical doctor in the last 12 months for their mental health problems were treated as mental health service users.

2)   General Health Service Utilization

The SAHDS included questions from the Primary Care Assessment Survey (PCAS; Safran, Kosinski, Tarlov, Rogers, Taira, Lieberman & Ware, 1998) that asked about accessing health services from a regular doctor. Two of these questions asked whether the respondent had a regular doctor and if the respondent had a regular doctor, when the respondent last visited the doctor. The respondent could choose from 5 options (less than 1 month ago; one to three months ago; four to six months ago; seven months ago; more than a year ago) to indicate the last visit to the regular doctor.

In this study it was of interest to know whether the respondent who had symptoms of either of depression, anxiety or somatization has utilized health services in the recent past. The questions in the PHQ scales asked for experience of symptoms over the last two weeks for depression and somatization and last four weeks for anxiety. As these symptoms were likely to have increased over a period of time, it was expected that those experiencing symptoms may have used health services in the recent few months of the past. However, those who did not have access to a regular doctor were not likely to have used health services. Accordingly, utilization of general health services was measured by creating a dichotomous

variable. People who had visited their regular doctor in less than three months were considered to have utilized general health services and those did not have a regular doctor or had visited a regular doctor more than three months ago were considered to have not utilized general health services for the mental health problems under consideration.

C.   Data Analysis

Various statistical analyses conducted for this study are described in the following sections. These analyses were conducted using the SPSS (version 17).

1.   Scale Statistics

Though the SAHDS questionnaires underwent rigorous translation procedures, none of the scales except the PHQ had been used with the SA population. Therefore, in this study their construct validity was ascertained by conducting Principal Components Analysis and internal consistency was ascertained by computing Cronbach's alpha for each scale.

2.   Sample Size and Power Analysis

Post hoc power analysis using the omnibus test for multiple regression analysis was conducted using the G*Power 3 software (Faul, Erdfleder & Buchner, 2007). This analysis showed that with a sample of 331, the study had adequate power (0.85) to test small to medium effect size ($f^2 > 0.08$) with 24 independent variables at an alpha level of 0.05.

3.   Univariate Analyses

Among the demographic variables, means and standard deviations were calculated for continuous variables of age and monetary resources.

Frequencies and percentages were calculated for independent variables of insurance status and duration of stay in US which were measured at nominal and ordinal level. Means and standard deviations were calculated for independent variables measured at the interval level: cultural identity, fluency in English, social support, negative beliefs about mental illness and stigma. Among the dependent variables, for the mental health variables of

depression, anxiety and somatization, means and standard deviations were calculated. Additionally, to understand the distribution of the disorders according to severity levels, scores in different categories of severity were computed and corresponding frequencies and percentages calculated. As the variables of mental health and general health service utilization were dichotomous variables, frequencies and percentages for both categories within each variable were calculated. Additionally, frequency and percentage of people not having a regular doctor was also calculated.

4.   **Bivariate Analyses**

Pearson's correlation coefficients between depression, somatization and anxiety were computed to identify whether a high correlation indicated the need for a principal components analysis. Pearson's correlation coefficients were also calculated to examine the associations between age, monetary resources, cultural identity, fluency in English and social support with mental health outcome variables (severity scores on depression, anxiety and somatization).

Student's t tests were conducted to check whether the scores on mental health outcomes differed according to gender and employment. One-way ANOVAs were conducted to examine differences in mental health outcomes according to duration of stay in the US and education level of participants.

Point bi-serial correlations were calculated to examine the association between the variables of age, monetary resources, cultural identity, fluency in English, social support, depression, anxiety, somatization, negative beliefs about mental illness and stigma and outcomes of general health service utilization and mental health service utilization. Chi square tests were conducted to examine differences in mental health services use and general health services use according to gender, education, duration of stay in U.S. and insurance status.

The above mentioned bivariate analyses with outcome variables of health service

utilization served to address the fifth research question of the study: to what extent do SAs

suffering from depression, anxiety and somatization utilize health services? Significant

differences in health service use of both types by several independent variables confirmed

that multivariate analysis was warranted. Accordingly, multiple regression analysis was

conducted for the outcome of general health service use. Similar multivariate analysis could

not be conducted for mental health service use as only 13 (3.9%) had used mental health

services.

5. Multivariate Analysis

Three types of multivariate analyses were conducted: principal component

analysis, multiple linear regression analysis and multiple logistic regression analysis. These

analyses are presented as applicable to different research questions.

a. Principal Components Analysis

Principal components analysis was used to address the following

research question:

Research Question 1: Can depression, anxiety and somatization among the South

Asian immigrant population be represented by a combined factor representing psychological

distress?

Principal components analysis was used as this analytical technique can be used to

identify the presence of a common factor across different variables. In PCA the first

component extracts the maximum variance from the variables and the second component

extracts from the remaining variance and so on for as many components are extracted from

the data (Garson, n.d.). Quartimax rotation was used as it is recommended when one general

factor is expected (Pedhazur and Schmelkin, 1991).

This analysis was conducted with all but one item from the three measures of depression, anxiety and somatization. The item excluded asked only female participants about "menstrual cramps" and therefore data was not available for all the participants.

b.   Multiple Regression Analysis

1)   Multiple Linear Regression Analysis

A hierarchical approach to multiple linear regression analysis was adopted to address research questions related to factors predicting mental health outcomes. This approach was chosen as it aided in evaluating the influence of each psychosocial factor after controlling for the effect of other factors (Cohen & Cohen, 1983; Pedhazur, 1997).

Three separate regression models were developed by regressing the variables of depression, anxiety and somatization on predictor variables. Applying the theoretical framework of this study, variables were entered in the following order: demographic and control variables in the first step, mesosystemic (social support) and chronosystemic (acculturation variables of cultural identity, duration of stay in U.S. and fluency in English) variables in the second step and interaction terms in the third step.

Prior to developing these models, assumptions of linear regression were examined according to standard guidelines (Cohen, Cohen, West & Aiken, 2003; Chen, Ender, Mitchell, & Wells, 2003; Pedhazur, 1997). Scatter plots of standardized residuals of independent variables and predicted values were plotted to examine non-linearity and non-constant variance of residuals (heterosecadisticity) and q-q plots were plotted to examine normality of residuals. As the residuals for depression, anxiety and somatization were positively skewed, these variables were log transformed to attain distributions closer to normality and then regressed upon the predictor variables. In these models there was no problem of high collinearity as VIF values were well below 10. None of the observations in

any of the model had excessive leverage or influence on the residuals as indicated by Cook's D values. Outliers were identified examining plots of residuals of outcome variables with each independent variable and using a cut-off of greater than 2.5 studentized residual values. There were no outliers in the model for anxiety but three outliers in the model for depression and one in the model for somatization were identified and these were excluded from analysis.

The rationale for using the hierarchical approach is explained sequentially according to each research question.

Research Question 2: To what extent do acculturation and social support predict the three disorders of depression, anxiety and somatization?

Socio-demographic variables of age, gender, years of education, monetary resources are employment were entered in the first step as these variables could confound the association of acculturation and social support with the mental health outcome variables. In the model for somatization, the variable of diagnosed health conditions was also controlled for as it correlated significantly with somatization.

In the second step acculturation variables (acculturation identity, duration of stay in U.S. (dummy coded) and fluency in English) and social support were be entered. Because there was no evidence suggesting that acculturation was more important than social support in predicting CMD or vice versa both these variables were entered as a part of a set and not independently.

Research Question 3: Do the factors of acculturation and social support interact in predicting three disorders of anxiety, depression and somatization?

Research reviewed for this study suggests that acculturation and social support may be correlated. To examine this association, in the third step (continuing the analysis described above) interaction variables between select acculturation variables and social support that

were identified as important predictors and whose interactions were theoretically meaningful were entered.

Research Question 4: Is the association between acculturation, social support and three disorders of anxiety, depression and somatization moderated by the socio-demographic variables of gender, years of education and monetary resources?

Empirical evidence indicates that gender and indicators of socio-economic status such as income and poverty are associated with common mental disorders. To examine the moderating effects of these variables on the relationship between acculturation, social support and mental health outcomes, interaction terms were formed between select variables. These terms were formed based on the patterns of regression coefficients in the model and if they were theoretically meaningful. Such interaction terms were entered in the third step along with interaction terms between acculturation and social support variables.

Interaction terms added to the models were retained only if they made substantial and significant addition to the overall variance explained by the predictors or if they drastically changed the coefficients of other predictors in the model.

2) **Multiple Logistic Regression Analysis**

Logistic regression analysis was conducted to address research questions related to factors predicting general health service use. A regression model was developed by regressing the dichotomous variable of general health service use in the past three months on predictor variables. Following the conceptual framework of this study, predictors were entered hierarchically in the following order: demographic and control variables were entered in the first step, mental health variables in the second step, interpersonal, intrapersonal and institutional variables in the third step and interaction terms in the fourth step.

Prior to developing this model, diagnostics for logistic regression were conducted according to the protocol given by Menard (1995). These included checking for collinearity between independent variables, identifying cases with studentized deleted residual values with values less -3 or greater than +3 for normality of residuals, checking leverage values in excess of (k+1)/N and checking *dbeta* values greater than 1 to identify outliers. The overall model fit was evaluated using the Hosmer and Lemeshow goodness of fit test and changes in model chi-square with addition of predictors in a new step were evaluated using the model chi-square.

The rationale for hierarchical approach is explained sequentially according to each research question:

Research Question 6: To what extent is utilization of general health services predicted by the three disorders of anxiety, depression and somatization?

After controlling for demographic and control variables in the first step, in the second step the mental health variables of depression, anxiety and somatization were entered to understand the association of each of these variables with use of general health services.

Research Question 7: To what extent acculturation, social support, negative beliefs about mental illness, stigma, and insurance status influence utilization of general health services?

There is empirical evidence indicating that acculturation (e.g. Ahmad, Shik, Vanza, Cheung, George & Stewart, 2004), social support (Kim, Sherman and Taylor, 2008), negative beliefs about mental illness (Fazil & Cochrane, 1998, cited by Hussain & Cochrane, 2002), stigma (Cinnirella & Loewenthal, 1999; Gilbert, Gilbert & Sanghera, 2004), and insurance status may influence utilization of health services (Choi, 2006). As the relative importance of these predictors is not known these variables were entered together in the third step.

Research Question 8: To what extent do gender, education, monetary resources, acculturation, social support, and socio-cultural factors (negative beliefs about mental illness and stigma), and insurance status moderate the association between anxiety, depression, somatization and utilization of general health services?

This question had to be answered by entering interaction terms between mental health variables (depression, anxiety and somatization) with other variables entered in the model (gender, monetary resources, acculturation, social support, negative beliefs about mental illness and stigma). The moderate sample size of 331 did not allow for entering all possible interactions. Therefore, a series of regression analyses were separately conducted by entering interaction terms between depression, anxiety and somatization and a predictor found to be significant in the third step and which was also theoretically meaningful to form an interaction term. The final model was selected according to the interaction terms that significantly added to the model fit.

D.   Human Subjects Protection

This study involved secondary analysis of de-identified data from the SAHDS which was approved by the Office for Protection of Research Subjects (OPRS) at the University of Illinois at Chicago (UIC). The current study was also approved separately by the OPRS, UIC.

IV. RESULTS

A.   Sample Profile

Data for this study was collected from 331 participants at three community based

organizations in Chicago. Most participants were recruited at Metropolitan Asian Family

Services (55.9%), 27.8% were recruited at Indo-American Center and16.3% were recruited

at Humdard Center. A little more than half of the participants (57.7%) chose to be

interviewed in Gujarati and 22.1% and 20.2% interviewed in Hindi and English respectively.

Most participants were immigrants from India (84.0%) and Pakistan (13.6%). Around

equal number of participants were Hindus (44.1%) and Muslims (45.3%). Mean age of

participants was 61.60 (SD = 10.62), 61.3% were women and most (72.5%) were currently

married. Educational level of the participants varied widely with the two largest groups being

those with less than high school level education (47.1%) and those with college level

graduate training (21.7%). Approximately two-thirds of the participants (66.2%) were not

working at the time of the survey (See Table I for detailed demographic profile).

B.   Psychometric Properties of Scales

As many measures used in the study were not previously used with the immigrant SA

population, psychometric properties of such scales were assessed by calculating Cronbach's

alpha coefficient of reliability and conducting principal components analysis to examine

whether the factor structure resembled with that of the original scale.

1.   FRS Money Subscale

Five items forming this subscale were chosen from the Family Resources

Scale (FRS) as reported by Van Horn, Bellis & Snyder (2001). All the items loaded on to a

single factor and had a Cronbach's alpha coefficient of .76. A mean score was calculated for

the purpose of analysis.

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TABLE I

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Characteristics	Frequency (Percent) N = 331
Country of origin	
India	278 (84.0)
Pakistan	45 (13.6)
Bangladesh	5 (1.5)
Sri Lanka	1 (0.3)
Burma	2 (0.6)
Religion	
Muslim	150 (45.3)
Hindu	146 (44.1)
Christian	11 (3.3)
Jain	11 (3.3)
Sikh	4 (1.2)
Other	6 (1.8)
No religion	2 (0.6)
Gender	
Men	128 (38.7)
Women	203 (61.3)
Age	
40-54	86 (26.0)
55-64	95 (28.7)
65-74	115 (34.7)
75-86	35 (10.6)
Marital Status	
Married	240 (72.5)
Not married, living with partner	2 (0.6)
Single	9 (2.7)
Separated	7 (2.1)
Divorced	8 (2.4)
Widowed	65 (19.6)
Education	
No education	6 (1.8)
Less than high school	154 (47.1)
High school graduate	29 (8.9)
Some college	20 (6.1)
College graduate	71 (21.7)
Post-graduate training	25 (7.6)
Professional degree	20 (6.1)
Other	2 (0.6)
Employment	
Full-time employed	47 (14.3)
Part-time employed	64 (19.5)
Not employed	217 (66.2)

2. Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA) Scale

Two items from this scale asked about the ethnic origin of respondent's friends up to age 6 and between ages 6-18. On both these items there was almost no variance with more than 98% of the respondents reporting friends of South Asian origin only; these items were therefore excluded from the scale. The factor structure of the remaining items indicated that the only item measuring pride in being a South Asian did not load on to any factor. After excluding this item from analysis the factor structure that emerged from 17 items resembled that of the original scale. The Cronbach's alpha coefficient for these 17 items was .81. A mean score on these items was calculated for the purpose of analysis.

3. Sense of Support Scale

Principal components analysis of the 21 items in the scale showed five factors. All items in the scale loaded on the first two factors and these meaningfully represented "quantity" and "quality of social support" and few of the items loaded on to the other three factors as well. Scale constructors have also reported subscales on quantity and quality, but recommend using this scale as a measure of global support (Dolbier & Steinhardt, 2000) and computing a composite score for all items (Steinhardt, personal communication, July 8, 2009). Therefore, reliability was calculated for 21 items in the scale (Cronbach's alpha = .81) and in analysis, a mean score for these items was calculated.

4. Beliefs Toward Mental Illness

Two subscales, the interpersonal and social skills subscale and the incurability subscale of the BTMI scale (Hirai & Clum, 2000) were analyzed separately. All items in each subscale had greater than 0.40 loading on a single factor and Cronbach's alpha coefficients were .77 and .71 for interpersonal and social skills subscale and incurability subscale respectively. Mean of the two subscale scores was calculated to get a composite measure of negative beliefs about mental illness.

5. Stigma Scale for Receiving Psychological Help

Principal components analysis revealed that the five items of this scale had greater than 0.40 loading on a single factor and a Cronbach's alpha coefficient of .70. The mean of the five items was calculated for the purpose of analysis.

6. Patient Health Questionnaire Scales

Three scales from the PHQ scales were used to measure depression, anxiety and somatization. The PHQ has been found to be valid in the U.S. (Spitzer, Kroenke, Williams, & The Patient Health Questionnaire Primary Study Group, 1999) and also in a recent study in India (Avasthi, Varma, Kulhara, Nehra, Grover & Sharma, 2008). These studies have reported the PHQ's psychometric properties in terms of its accuracy, sensitivity and specificity in diagnosis of depression, anxiety and somatization. Given the strong psychometric properties of the scale, only reliability coefficients were calculated in this study for depression, anxiety and somatization (Cronbach's alpha coefficients: 0.85, 0.85 and 0.84, respectively).

C. Univariate Analysis

Univariate analysis was conducted to understand the means and distribution of all variables used in subsequent bivariate and multivariate analysis. Means and standard deviations were calculated for interval level variables and frequencies and percentages for nominal or ordinal variables.

1. Control Variables

The two control variables in the study were: self-reported health condition and diagnosed health condition. Self-reported health condition was measured on a scale of poor (1) to excellent (5); the mean score for the sample was 3.13 ($SD = 1.05$). Participants in this study had on average 1.04 diagnosed health conditions ($SD = 1.0$) (Table II).

2.   Independent Variables

Participant's average scores on independent variables measured at interval level were: monetary resources (M = 2.63, SD = 0.97); fluency in English language (M = 2.36 , SD = 1.41); cultural identity (M = 1.93, SD = 0.45); social support (M = 3.13, SD = 0.51); negative beliefs about mental illness (M = 28.18, SD = 6.77); stigma associated with receiving help from mental health practitioner (M = 1.95, SD = 0.70) (Table II). More than half the participants (56.8%) had lived in the U.S. for more than 10 years, 20.3% had lived in U.S. for six to ten years and 17.3% had been in the U.S. for one to five years (Table III). More than one-third (37.7%) participants did not have health insurance and around one-fourth (25.7%) had Medicaid insurance followed by 12.7% having Medicare insurance and 10.3% having insurance from work (Table III).

TABLE II

AVERAGE SCORES ON INTERVAL LEVEL VARIABLES

Variables	N	Mean	Standard Deviation
Control Variables			
Self-Reported Health Condition	331	3.13	1.05
Diagnosed health condition	331	1.04	1.00
Independent Variables			
Monetary resources	328	2.63	0.97
Fluency in English	330	2.36	1.41
Cultural Identity	331	1.93	0.45
Social Support	330	3.13	0.51
Beliefs Toward Mental Illness	331	28.18	6.77
Stigma	331	1.95	0.70
Dependent Variables			
Depression	331	3.03	4.58
Anxiety	331	1.81	3.00
Somatization	331	3.87	4.21

TABLE III

FREQUENCIES FOR NOMINAL AND ORDINAL LEVEL VARIABLES

Characteristics	Frequency (Percent) N=331
Independent Variables	
Years in U.S.	
Less than 1 year	18 (5.5)
1 – 5 years	57 (17.3)
6 – 10 years	67 (20.3)
More than 10 years	188 (56.8)
Health Insurance	
No health insurance	124 (37.7)
Free healthcare	19 (5.8)
Self-pay	17 (5.2)
Through work	34 (10.3)
Medicare	42 (12.7)
Medicaid	85 (25.7)
Other	2 (0.6)
Dependent Variables	
Depression Severity	
None (0-4)	251 (75.8)
Mild (5-9)	48 (14.5)
Moderate (10-14)	18 (5.4)
Moderately Severe (15-19)	14 (3.0)
Severe (20-27)	4 (1.2)
Somatization Severity	
Minimal (0-4)	216 (65.3)
Low (5-9)	77 (23.3)
Medium (10-14)	29 (8.8)
High (15-30)	9 (2.7)
General health service use	
No visit (no doctor)	117 (35.3)
Less than 1 months ago	96 (29.1)
1 – 3 months ago	73 (22.1)
4 – 6 months ago	18 (5.4)
7 months – 1 year ago	11 (3.3)
More than 1 year ago	15 (4.5)
Mental health service use	
Yes	13 (3.9)
No	318 (96.1)

3. Dependent Variables

The mean scores on the mental health outcome variables were 3.03 ($SD =$ 4.58, Range = 0-25) for depression, 1.81 ($SD = 3.00$, Range = 0-14) for anxiety and 3.87 (SD = 4.21, Range = 0-21) for somatization. For depression and somatization scales, norms to establish severity based upon number of symptoms are available (Kroenke, Spitzer & Williams, 2001; Kroenke, Spitzer & Williams, 2002). Eighty four participants (24.1%) had greater than the four point score needed to qualify for mild level depressive symptoms; 14.5%, 5.4%, 3.0% and 1.2% had mild, moderate, moderately severe and severe levels of depressive symptoms (Table III). One hundred and fifteen participants (34.8%) had greater than the four point score needed to qualify for mild level of somatization; 23.3%, 8.8% and 2.7% had low, medium and high levels of somatic severity (Table III). On the anxiety scale, 39.7% (n = 131) reported at least one symptom of anxiety.

Around one-third of the participants (35.3%) did not have a regular doctor and 29.1% and 22.1% had visited their regular doctor before one and three months respectively. Only 13 participants (3.9%) had used mental health services in the last one year (Table III).

D. Bivariate Analysis

Pearson's correlation coefficients between depression, anxiety and somatization were calculated to examine whether the correlation between these three disorders was high and indicated a presence of a common factor. The correlation coefficients were indeed high: .78 ($p<.001$) between depression and anxiety; .70 ($p<.001$) between depression and somatization; .70 ($p<.001$) between anxiety and somatization.

Pearson's correlation coefficients were also calculated between continuous level independent variables and depression, anxiety and somatization (Table IV). A marginal yet significant correlation between age and anxiety ($r = .11$, $p<.05$) suggested that with increase in age, participants' anxiety increased. Adequacy of monetary resources was negatively

correlated with depression ($r = -.30$, $p<.01$), anxiety ($r = -.32$, $p<.01$) and somatization ($r = -.29$, $p<.01$) indicating that inadequacy of family's monetary resources was associated with greater levels of mental health problems. Of the acculturation variables, cultural identity was not significantly associated with any of the mental health outcomes. However, fluency in English, an indicator of acculturation, was negatively associated with depression ($r = .13$, $p<.05$) and somatization ($r = .12$, $p<.05$) suggesting that people with better fluency in English had lower scores on depression and somatization. The significant negative correlations between social support and the mental health outcomes of depression ($r = -.28$, $p<0.01$), anxiety ($r=-.22$, $p<.01$) and somatization ($r = -.17$, $p<.01$) suggested that people having higher levels of social support were less likely to have mental health problems.

TABLE IV

PEARSON'S CORRELATIONS BETWEEN INDEPENDENT VARIABLES AND DEPRESSION, ANXIETY AND SOMATIZAITON

	Depression	Anxiety	Somatization
Age	0.07	0.11*	0.11
Monetary Resources	- 0.30**	- 0.32**	- 0.29**
Cultural identity	- 0.07	- 0.09	0.05
Fluency in English	- 0.13*	- 0.11	- 0.12*
Social Support	- 0.28**	- 0.22*	- 0.17*

**$p<0.01$, *$p<0.05$

Differences in scores on depression, anxiety and somatization by gender and employment were examined by conducting t tests (Table V). Men and women did not differ significantly on measures of depression, anxiety and somatization. The variable of employment was re-coded to form two groups: people currently not working and people

currently working either part time or full time. Currently working people differed from non-working people; they had significantly lower scores on measures of depression (Working: M = 1.68, SD = 2.72; Non-working: M = 3.68, SD = 5.09, t = 4.62, p<.01), anxiety (Working: M = 1.15, SD = 2.49; Non-working: M = 2.14, SD = 3.16, t = 3.10, p<.01) and somatization (Working: M = 2.94, SD = 3.62; Non-working: M = 4.36, SD = 4.42, t = 3.11, p<.01).

TABLE V

T TESTS OF MENTAL HEALTH OUTCOME VARIABLES BY GENDER AND
EMPLOYMENT

Mental Health	Mean	SD	t statistic
		Gender	
Depression			
Men (n=128)	2.87	4.85	0.51
Women (n=203)	3.13	4.41	
Anxiety			
Men (n=128)	1.52	2.63	1.43
Women (n=202)	2.00	3.20	
Somatization			
Men (n=128)	4.14	4.17	1.46
Women (n=203)	3.45	4.26	
		Employment	
Depression			
Working (111)	1.68	2.72	4.62**
Not working (217)	3.68	5.09	
Anxiety			
Working (110)	1.15	2.49	3.10**
Not working (217)	2.14	3.16	
Somatization			
Working (111)	2.94	3.62	3.11**
Not working (217)	4.36	4.42	

$**p<0.01$, $*p<0.05$

One way ANOVAs were conducted to examine differences in depression, anxiety and somatization by duration of stay in the U.S. and level of education (Table VI) with post-hoc Bonferroni comparisons to examine group differences. Before conducting ANOVA, education was re-coded into 3 groups (less than high school education; high school to graduate level education and higher than college graduate education) and duration of stay was also recoded into three groups: less than 5 years in U.S.; six to 10 years in U.S.; more than 10 years in U.S. Significant difference by duration of stay in U.S. was found for somatization (F (2, 327) = 3.05, p = .05), but not for depression and anxiety. Average severity of somatic symptoms of people who had lived in the U.S. for less than six years was marginally different from those who had lived in the U.S. for more than 10 years (M = 3.00 vs. M = 4.35, p = .06). Significant differences by levels of education were found for depression (F (2, 324) = 4.17, p = .02) and anxiety (F (2, 323) = 3.26, p = .04), but not somatization. Compared to people having high school to graduate college level education, people with less than high school education had higher mean score on depression (M = 3.63 vs. M = 1.53, p = .01) and anxiety (M = 2.19 vs. M = 1.71, p = .04).

The variable of general health service use was dichotomized into two categories: use of general health services in last three months and no use or use of health service more than three months ago. The association of general health service use with continuous independent variables of age, monetary resources, cultural identity, fluency in English, social support, depression, anxiety, somatization, beliefs toward mental illness and stigma was examined by calculating point bi-serial correlations (Table VII). A significant positive association was seen between general health service use age, perceived adequacy of monetary resources, anxiety scores and somatization scores. Differences in use of general health services by categorical variables of language of interview, gender, education, duration of stay in U.S. and insurance were examined by conducting chi square tests of independence (Table IX).

TABLE VI

ANOVA OF MENTAL HEALTH OUTCOME VARIABLES BY DURATION OF STAY
IN U.S. AND EDUCATION

Duration of Stay and Education	Mean	*SD*	F	MSE
Depression				
Years in U.S.				
Less than 5 years (n=75)	2.23	3.64	2.12	44.21
6 – 10 years (n=67)	2.76	4.31		
More than 10 years (n=188)	3.46	4.97		
Education				
Less than high school (n=160)	3.63	5.12	4.17*	86.46
High school to College Graduate (n=51)	1.53	2.94		
More than college graduate (n=116)	2.96	4.30		
Anxiety				
Years in U.S.				
Less than 5 years (n=75)	1.36	2.90	1.85	16.50
6 – 10 years (n=66)	1.58	2.51		
More than 10 years (n=188)	2.09	3.17		
Education				
Less than high school (n=159)	2.19	3.39	3.26*	29.03
High school to College Graduate (n=51)	1.00	2.33		
More than college graduate (n=116)	1.71	2.63		
Somatization				
Years in U.S.				
Less than six years (n=75)	3.00	3.93	3.05*	53.50
6 – 10 years (n=67)	3.55	4.04		
More than 10 years (n=188)	4.35	4.33		
Education				
Less than high school (n=160)	4.42	4.50	2.80	49.42
High school to College Graduate (n=51)	2.96	3.96		
More than college graduate(n=116)	3.59	3.86		

**$p<.01$, *$p<.05$

TABLE VII

POINT BI-SERIAL CORRELATIONS
BETWEEN GENERAL HEALTH SERVICE USE AND INDEPENDENT VARIABLES

Independent Variables	General Health Service Use
Age	.22***
Monetary Resources	.11*
Cultural identity	-.03
Fluency in English	-.07
Social Support	.08
Depression	.06
Anxiety	.12*
Somatization	.15**
Beliefs toward mental illness	-.01
Stigma	.05

***$p<0.001$, **$p<0.01$, *$p<0.05$

TABLE VIII

POINT BI-SERIAL CORRELATIONS
BETWEEN MENTAL HEALTH SERVICE USE AND INDEPENDENT VARIABLES

Independent Variables	Mental Health Service Use
Age	.01
Monetary Resources	-.14*
Cultural identity	.06
Fluency in English	-.06
Social Support	-.17**
Depression	.28**
Anxiety	.21**
Somatization	.18**
Beliefs toward mental illness	-.01
Stigma	-.10

***$p<0.001$, **$p<0.01$, *$p<0.05$

General health service use was significantly higher (72.2%) among participants who had lived in the U.S. for more than ten years as compared to general health service use by 18.3% and 9.5% among those who had lived between six to ten years and for five years or less in the U.S. respectively ($\chi^2_{(df=2)}$ = 41.36, $p<.01$). To facilitate meaningful comparisons, the variable of insurance was re-coded into five categories before examining the difference among service users and non-users. Use of general health services was significantly higher (60.1%) among those with Medicare or Medicaid (60.1%) as compared general health service use by 16.1% of those with insurance from work or spouse, 4.8% who paid for medical care from their pockets (self-pay) and 6.5% who sought care from free clinics and 12.5% who did not have health insurance ($\chi^2_{(df=4)}$ = 110.25, $p<.01$).

Similarly, point bi-serial correlations (Table VIII) and chi square tests (Table IX) were computed for mental health service use. While there were no significant differences in use of mental health services by the categorical variables, use of mental health services was significantly associated with several of the continuous variables. Adequacy of monetary resources and social support were significantly negatively associated with use of mental health services. Depression, anxiety and somatization scores were significantly positively associated with use of mental health services.

E.   Multivariate Analysis

1.   Principal Components Analysis

An exploratory principal components analysis (PCA) was conducted to address the research question:

Can depression, anxiety and somatization among the South Asian immigrant

population be represented by a combined factor representing psychological distress?

TABLE IX

CHI SQUARE TESTS OF HEALTH SERVICE USE BY INDEPENDENT VARIABLES

Independent Variables	General Health Service Use			Mental Health Service Use		
	Yes n (%)	No n (%)	χ^2	Yes n (%)	No n (%)	χ^2
Language						
English	37 (21.9)	29 (18.0)	1.71	3 (23.1)	64 (20.1)	5.31
Gujarati	99 (58.6)	92 (57.1)		4 (30.8)	187 (58.8)	
Hindi	33 (19.5)	40 (24.8)		6 (46.2)	67 (21.1)	
Gender						
Male	66 (39.1)	61 (37.9)	0.05	4 (30.8)	124 (39.0)	0.36
Female	103 (60.9)	100 (62.1)		9 (69.2)	194 (61.0)	
Education						
< High school	85 (50.6)	75 (47.5)	0.35	10 (76.9)	150 (47.8)	4.25
High school to college Graduate	25 (14.9)	26 (16.5)		1 (7.7)	50 (15.9)	
> College Graduate	58 (34.5)	57 (36.1)		2 (15.4)	114 (36.3)	
Years in U.S.						
< than 6 years	16 (9.5)	59 (36.9)	41.36**	1 (7.7)	74 (23.3)	4.22
6 – 10 years	31 (18.3)	35 (21.9)		1 (7.7)	66 (20.8)	
> 10 years	122 (72.2)	66 (41.3)		11 (84.6)	177 (55.8)	
Health Insurance						
No insurance	21 (12.5)	102 (63.8)	110.25**	4 (30.8)	120 (38.0)	1.78
Free clinics	11 (6.5)	16 (10.0)		1 (7.7)	26 (8.2)	
Self-pay	8 (4.8)	9 (5.6)		0 (0.0)	17 (5.4)	
Through work	27 (16.1)	7 (4.4)		1 (7.7)	33 (10.4)	
Medicare / Medicaid	101 (60.1)	26 (16.3)		7 (53.8)	120 (38.0)	

**$p<0.01$, *$p<0.05$

The PHQ depression, anxiety and somatization scales together have 29 items. One item, applicable only to women (menstrual cramps or other problems with your periods), was not included in analysis. Quartimax rotation procedure was used as a unitary factor was expected from the analysis (Pedhazur & Schmelkin, 1991). Results from the PCA were interpreted on the basis of Kaiser criterion, scree plot and examination of item loadings on each factor. As per the Kaiser criterion, factors with greater than Eigen value of one were evaluated. Items were considered to load on a factor if their loading on that factor was more than 0.40 (Pedhazur & Schmelkin).

The results showed seven factors with Eigen values greater than 1 (Table X). This indicated that common mental disorders were not represented by a single factor. However, to evaluate any other systematic patterns the scree plot (Figure 2) was evaluated next. The curve showing factors flattened from Factor 3 onwards. This suggested that only two of the seven factors could be considered as explaining the variance in the data. Corresponding to this only the first and the second factors had Eigen values more than two and all the other factors had less than 1.5 Eigen values (Table X). A further examination of the seven factors and items with greater than 0.4 loading on each of these factors also confirmed the existence of only two interpretable factors (Table XI). On the first factor, except for the item measuring "suicidal ideas", all items from the depression scale, anxiety scale and five of the 12 somatization scale items ("back pain", "pain in arms", "dizziness", "heart pounding" and "shortness of breath") had factor loadings greater than 0.4 on Factor 1. This factor contributed to the maximum variance (30.25%) and also included the widest range of items from all the scales. Though this factor did not include all symptoms of each disorder, it partially endorsed the dimensional perspective on common mental disorders as it included symptoms of each of the three disorders. The second factor had only three items with loadings greater than 0.4. These three items ("stomach pain"; "constipation, loose bowels or

diarrhea" and "nausea, gas or indigestion") were from the somatization scale and represented

a cluster of gastric somatic symptoms and contributed to more than seven percent of the

variance. On each of the remaining five factors the items with greater than 0.4 loading did not

meaningfully cluster as did in the case of Factor 2. Furthermore, most of the items on these

factors had a greater 0.4 loading on Factor one. Only three items that did not belong to Factor

1 or Factor 2 but had a loading greater than 0.4 on one of the other five factors were the

somatic items of "pain during sexual intercourse", "chest pain" and "fainting spells".

Additionally, the somatization item of "headaches" did not have a loading greater than 0.4.

The principal components analysis discussed above showed that depression, anxiety

and somatization are not represented by a single factor. As few somatization items belonged

to one factor that had all symptoms of depression (except suicidal ideation) and anxiety, it

can be inferred that somatization symptoms are indeed important in understanding CMDs

among SA immigrants.

TABLE X

EIGEN VALUES AND VARIANCE CONTRIBUTION OF FACTORS

Factor	Eigen Value	Percentage of Variance	Cumulative Percentage of Variance
1	9.13	30.26	30.26
2	2.23	7.54	37.80
3	1.45	5.12	42.92
4	1.35	4.98	47.89
5	1.20	4.97	52.86
6	1.03	4.75	57.62
7	1.02	4.53	62.15

Figure 2. Scree plot

TABLE XI

PRINCIPAL COMPONENTS ANALYSIS OF ITEMS FROM THE DEPRESSION, ANXIETY AND SOMATIZATION SCALES

	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
1.	Stomach pain[a]		.772					
2.	Back pain[a]	.472						
3.	Pain in arms[a]	.504						-.424
4.	Pain during sexual intercourse[a]			.718				
5.	Headaches[a]							
6.	Chest pain[a]					.690		
7.	Dizziness[a]	.452			.427	.434		
8.	Fainting spells[a]				.828			
9.	Heart pounding[a]	.416						
10.	Shortness of breath[a]	.457		.414				
11.	Constipation, loose bowels or diarrhea[a]		.656					
12.	Nausea, gas or indigestion[a]		.593	.404				
13.	Lack of interest/pleasure[b]	.643						
14.	Feeling depressed[b]	.696						
15.	Trouble with sleep[b]	.738						
16.	Feeling tired[b]	.787						
17.	Poor appetite/overeating[b]	.649						.428
18.	Feeling bad about self[b]	.607					.414	
19.	Difficulty concentrating[b]	.621						
20.	Tardiness or restlessness[b]	.511						.579
21.	Suicidal ideas[b]						.707	
22.	Feeling nervous/anxious[c]	.685						
23.	Feeling restless[c]	.669						
24.	Getting tired easily[c]	.722						
25.	Muscle tension[c]	.638						-.442
26.	Trouble with sleep[c]	.721						

TABLE XI (Contd.)

PRINCIPAL COMPONENTS ANALYSIS OF ITEMS FROM THE DEPRESSION, ANXIETY AND SOMATIZATION SCALES

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
27. Trouble concentrating[c]	.717						
28. Becoming easily annoyed/irritable[c]	.575						

Note. Item loads greater than 0.40 are shown.
[a]Somatization item. [b]Depression item. [c]Anxiety item.

2. Multiple Linear Regression Analysis

The following research questions were addressed using a hierarchical approach to multiple linear regression:

- To what extent do acculturation and social support predict depression, anxiety and somatization?

- Do the factors of acculturation and social support interact in predicting anxiety, depression and somatization?

- Is the association between acculturation, social support and depression, anxiety and somatization moderated by the socio-demographic factors of gender, education and monetary resources?

Regression analyses were conducted separately such that depression, anxiety and somatization were regressed individually on the various predictors under study. In these analyses demographic variables were controlled for in the first step and acculturation and social support variables were entered in the second step. In the third step, interaction terms between acculturation, social support and select demographic variables that retained statistical significance in the second step and were theoretically meaningful to be entered in an interaction term were entered. The final models developed for each of these outcomes included only those interaction terms that significantly moderated the relationship between acculturation, social support and the outcome.

a. Hierarchical Regression of Depression on Acculturation and Social Support

Depression scores were log transformed because the distribution of residuals for depression was positively skewed (Fig. 3). Log transformation brought it closer to a normal distribution (Fig. 4). Three outlier cases with greater than 2.5 studentized residual values which markedly changed the significance of predictor variables were excluded from

analysis. After removing the outliers none of the cases had excessive leverage, the maximum

Cook's D value was 0.07. Collinearity of independent variables was not a problem as none of

the VIF values were greater than five. However, in interaction terms continuous variables

were centered on their means to reduce possible high collinearity.

Figure 3. Distribution of standardized residuals for depression (n = 323)

Figure 4. Distribution of standardized residuals of log of depression (n = 320)

Demographic variables entered in the first step predicted 20% of the variance and

significant among these variables were gender, employment, education and monetary

resources. Men, those with more than high school but less than college graduate education,

those who were employed and reported having monetary resources had lower scores on

depression (Table XII). The acculturation variables (cultural identity, duration of stay in U.S.

and fluency in English) and social support entered in the second step added to the variance by

4.3% ($F_{(5,308)}$ = 3.46, $p<.01$). Of the added variables, only fluency in English and social

support significantly predicted lower depression scores. In the third step, interaction terms

between the acculturation variable of duration of stay and social support were added.

Addition of these interaction terms added only one percent to the overall variance explained

by the model and this addition was not significant. However, one interaction term, "duration

of stay in U.S. for more than 10 years X social support" significantly predicted depression.

This term's negative sign and slope (Fig. 5) indicated that people who have been in the U.S.

for more than 10 years, and yet have a low sense of support are likely to have higher

depression scores.

As the variance added by the interaction terms was not significant and rendered the

variable of employment insignificant, step 2 was retained as the final model. This model

explained 24% of the variance and was significant ($F_{(11,308)} = 8.86, p<.001$) (Table 12). All

the significant predictors in this model were associated with lower scores on depression:

being a male ($B = -0.24, p<0.05$), more than high school but less than college graduate level

education ($B = -0.44, p<0.01$), monetary resources ($B = -0.30, p<0.001$), being employed ($B

= -0.22, p<0.05$), fluency in English ($B = -0.13, p<0.05$) and social support ($B = -0.24,

p<0.05$). The significant unstandardized beta coefficients (B) indicated that, holding values of

all other predictors constant, an increase in one unit score on the measure of one predictor

was associated with a decrease in score on depression corresponding to the unstandardized

beta value. For example, holding values of all other predictors the same, an increase of one

unit score on fluency in English was associated with a decrease of one 0.13 units on

depression.

A comparison of the standardized beta (β) coefficients helps compare the influence of

all the predictors in the model even if they are not measured on the same scale. Such

comparison of significant predictors in the model shows that the predictor of monetary

resources ($\beta = -0.30$) was the strongest predictor and the key variables of interest, fluency in

TABLE XII

SUMMARY OF HIERARCHICAL REGRESSION ANALYSIS FOR VARIABLES PREDICTING DEPRESSION (N = 320)

Variable	Step 1			Step 2			Step 3		
	B	$SE\ B$	B	B	$SE\ B$	β	B	$SE\ B$	β
Constant	2.10	0.39		2.53	0.55		1.54	0.80	
Age	0.00	0.01	-.00	-0.00	0.01	-.01	0.00	0.01	-.01
Gender (Male)	-0.26	0.11	-.13**	-0.24	0.11	-.13*	-0.28	0.11	-.14**
Education									
Less than high school	-0.12	0.11	-.06	-0.02	0.14	-.13	-0.26	0.14	-.14
More than high school but less than college graduate	-0.42	0.15	-.16**	-0.44	0.15	-.17**	-0.46	0.14	-.18**
Monetary resources	-0.35	0.05	-.36***	-0.30	0.06	-.30***	-0.30	0.06	-.30***
Employment (Employed)	-0.25	0.11	-.13*	-0.22	0.11	-.11*	-0.21	0.11	-.11
Cultural identity				0.23	0.14	.11	0.21	0.14	.10
Years in U.S.									
6-10 years				0.03	0.15	.01	0.04	0.15	.02
More than 10 years				0.22	0.12	0.11	0.21	0.12	.12
Fluency in English				-0.13	0.05	-.19*	-0.12	0.05	-.18*
Social support				-0.24	0.10	-.13*	0.08	0.21	.04
6 -10 years in U.S. X Social support							-0.14	0.29	-.03
> 10 years in U.S. X Social support							-0.49	0.24	-.20*
R^2		.20			.24			.25	
F for change in R^2		12.86***			3.46**			2.61	

Note. Social support was centered at mean in interaction terms.

***$p<0.001$**$p<0.01$, *$p<0.05$.

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Figure 5. Interaction between duration of stay in U.S. for more than 10 years and social support and depression

English (β = -0.19) and social support (β = -0.13) had comparable yet independent effects on depression scores.

b. **Hierarchical Regression of Anxiety on Acculturation and Social**

Support

Regressing the variable of anxiety on predictor variables showed a positively skewed distribution of residuals (Fig. 6). Log transformation of anxiety scores yielded a closer to normal distribution of residuals (Fig. 7). There were no outliers, none of

Figure 6. Distribution of standardized residuals for anxiety (n = 322)

the cases had excessive leverage as indicated by Cook's D and multicollinearity was not a

concern as the VIF values for any of the predictors were not more than 2.5.

Demographic variables entered in the first step explained 17% of the variance ($F_{(6,315)}$

= 10.74, $p<.001$) and the acculturation variables (cultural identity, duration of stay in U.S.

and fluency in English) and social support entered in the second step explained only an

additional 2.6% to the variance (not significant). In step 1, being a male (B = -0.20, $p<.05$),

more than high school but less than college graduate level education (B = -0.31, $p<.05$),

Figure 7. Distribution of standardized residuals for log of anxiety (n = 323)

monetary resources (B = -0.28, p<.001) and being employed (B = -0.21, p<.05) predicted

lower scores on anxiety.

In step 2 the demographic variables of gender and employment did not remain

significant. However, the beta values of "being educated more than high school and less than

college graduate" (B = -0.31, p<.05) and "monetary resources" (B = -0.26, p<.05), the two

demographic variables significant in Step one, had not changed markedly and this indicated a

main effect of these variables in predicting anxiety. Though the acculturation variables and

social support did not significantly change the variance of the overall model, two variables

significantly predicted anxiety. Being in the U.S. for more than 10 years predicted higher

score on anxiety (B = 0.25, $p<.05$) and social support predicted lower score on anxiety (B = -

0.18, $p<.05$). This model was treated as the final model as none of the interaction terms

between the main variables of interest, acculturation variables and social support and gender,

education and monetary resources were significant (Table XIII). This model explained 19.6%

of the variance and the overall model was significant ($F_{(11,310)}$ = 4.03, $p<.001$).

TABLE XIII

SUMMARY OF HIERARCHICAL REGRESSION ANALYSIS FOR VARIABLES PREDICTING ANXIETY (N = 322)

Variable	Step 1			Step 2		
	B	SE B	β	B	SE B	β
Constant	1.41	0.35		2.03	0.50	
Age	0.00	0.01	.04	0.01	0.05	0.01
Gender (Male)	-0.20	0.10	-.12*	-0.19	0.10	-.11
Education						
Less than high school	-0.10	0.10	-.06	-0.11	0.13	-.07
More than high school but less than college graduate	-.031	0.13	-.14*	-0.31	0.13	-.14*
Monetary resources	-0.28	0.05	-.33***	-0.26	0.05	-.30***
Employment (Employed)	-0.21	0.10	-.12*	-0.17	0.10	-.10
Cultural identity				-0.08	0.13	-.04
Years in U.S.						
6-10 years				0.09	0.13	.04
More than 10 years				0.25	0.11	.15*
Fluency in English				0.01	0.05	.01
Social support				-0.18	0.09	-.11*
R^2		.17			.20	
F for change in R^2		10.74**			1.98	

***$p<0.001$**$p<0.01$, *$p<0.05$

The standardized beta values for significant predictors indicate that the demographic predictor of monetary resources was the strongest (β = -0.30). Social support (β = -0.11) and duration of stay in U.S. for more than 10 years (β = -0.15) were around equally important in predicting anxiety; social support predicted lower anxiety scores and staying more than 10 years predicted higher anxiety scores.

c.   **Hierarchical Regression of Somatization on Acculturation and Social Support**

The distribution of residuals for the model predicting somatization was positively skewed (Fig. 8). Analysis was conducted with a log transformed variable of somatization. The standardized residual versus predicted value plot for the regression analysis indicated one outlier. When this outlier was removed, the coefficients of predictors changed markedly and therefore analysis was conducted excluding this outlier case which also had a studentized deleted residual value greater than 2.5. The distribution of residuals after excluding the outlier was close to a normal distribution (Fig. 9).

The highest Cook's D value was 0.04 and thus no case had excessive leverage. Collinearity between independent variables was not a concern as the highest VIF value for any variable was 2.43. A person suffering from more than one diagnosed health condition is likely to report a greater number of somatic symptoms. Bivariate analysis showed that the variable of "diagnosed health conditions" and somatization were significantly correlated (r = 0.27, p<.001). Therefore, to avoid confounding by diagnosed health conditions, this variable was controlled for along with demographic variables entered in the first step. The first step explained 20% of the variance ($F_{(7, 314)}$= 11.24, p<.001). In this step, being a male (B = -0.28, p<.01), adequacy of monetary resources (B = -0.29, p<.05) predicted lower somatization scores and diagnosed health conditions (B = 0.22, p<.001) predicted higher scores on somatization. The second step added the acculturation variables (cultural identity, duration of

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Figure 8. Distribution of standardized residuals for somatization (n = 323)

stay in U.S. and fluency in English) and social support. Adding these variables increased the

variance by 2.8% ($F_{(5, 309)}$ = 2.21, $p<.05$) and did not markedly change the beta coefficients of

variables entered in the first step. Among variables that significantly predicted somatization,

diagnosed health conditions (B = 0.23, $p<.001$) and cultural identity (B = 0.31, $p<.05$) were

associated with greater scores on somatization. This indicated that participants who had

acculturated to having a more Western identity were likely to have more somatic symptoms.

Being a male (B = -0.26, $p<.05$) and having monetary resources (B = 0.29, $p<.001$) predicted

lower somatization scores. Interaction terms between acculturation variables, social support,

gender, monetary resources and diagnosed health conditions were entered in the next step.

Figure 9. Distribution of standardized residuals for log of somatization (n = 322)

However, as none of these interactions were significant, step 2 was retained as the final

model (Table XIV). This model was significant ($F_{(12, 309)}$ = 7.606, $p<.001$) and contributed to

23% of the variance. The standardized beta coefficients for significant predictors in the final

model indicated that the predictor of monetary resources (β = -0.31) was the strongest

predictor as compared to being a male (β = -0.14) and cultural identity (β = 0.15).

TABLE XIV

SUMMARY OF HIERARCHICAL REGRESSION ANALYSIS FOR VARIABLES PREDICTING SOMATIZATION (N = 322)

Variable	Step 1			Step 2		
	B	$SE\,B$	B	B	$SE\,B$	β
Constant	2.12	0.38		1.69	0.54	
Age	-0.00	0.01	.04	-0.00	0.01	-.05
Gender (Male)	-0.28	0.11	-.15**	-0.26	0.11	-0.14*
Education						
Less than high school	-.02	0.11	-.01	-0.08	0.13	-0.04
More than high school but less than college graduate	-0.13	0.14	-0.05	-0.15	0.14	-.06
Monetary Resources	-0.29	0.05	-.31***	-0.29	0.06	-0.31***
Employment (Employed)	-0.14	0.11	-.07	-0.12	0.11	-0.06
Diagnosed health conditions	0.22	0.05	.25***	0.23	0.05	0.25***
Cultural identity				0.31	0.14	0.15*
Years in U.S.						
6-10 years				-0.05	0.14	-0.02
More than 10 years				0.17	0.12	0.09
Fluency in English				-0.09	0.05	-0.13
Social support				0.00	0.10	0.00
R^2		0.20			0.23	
F for change in R^2		11.24***			2.21*	

***$p<0.001$**$p<0.01$, *$p<0.05$.

3. Multiple Logistic Regression Analysis

According to the proposed plan of analysis separate multiple logistic regression analyses were planned for two health service use outcome variables: use of mental health services and use of general health services. However, as only 13 (3.9%) of the 331 participants in the study had used mental health services multivariate analysis could not be conducted. Therefore, only use of general health services was addressed using a hierarchical approach to logistic regression to address the following research questions.

- To what extent is utilization of general health services predicted by depression, anxiety and somatization?

- To what extent acculturation, social support, negative beliefs about mental illness, stigma, and insurance status predict utilization of general health services?

- To what extent do gender, education, monetary resources, acculturation, social support, and socio-cultural factors (negative beliefs about mental illness and stigma), and insurance status moderate the association between anxiety, depression, somatization and utilization of general health services?

Hierarchical logistic regression analysis was conducted by regressing general health service use in the past three months on different sets of predictors. This analysis was conducted in four steps and was guided by the conceptual framework of the study. The protocol for logistic regression diagnostics given by Menard (1995) was followed in this analysis. The variable of "insurance" was re-coded into three categories as there was high collinearity between the original eight categories. The recoded categories did not pose a problem of high collinearity; these categories were: no insurance; health insurance through Medicaid / Medicare / Work; health insurance through other source of care / self-pay (reference category). Leverage values and studentized residual values did not indicate any

outliers and *dbeta* values for each predictor did not indicate any influential cases in the final model.

The four steps in the logistic regression analysis are summarized in Table XV. In the first step demographic variables of age, gender, education, monetary resources and control variables of self-reported health status and diagnosed health conditions were entered. In this step the three variables of age (OR = 1.05, CI = 1.02 - 1.08), monetary resources (OR = 1.64, CI = 1.25 - 2.14) and diagnosed health conditions (OR = 1.51, CI = 1.16 – 1.97) were significantly associated with greater odds of general health service use than non-use. The model fit well (Model $\chi^2_{(df=7)}$ = 42.12, p = .001; Hosmer-Lemeshow $\chi^2_{(df=8)}$ = 5.07, p = 0.75) and Nagelkerke's R^2 was .17.

In the second step, variables of depression, anxiety and somatization were entered to understand whether scores on these disorders independently predicted greater use of health services. While the variables of age (OR = 1.05, CI = 1.02 - 1.08), monetary resources (OR = 1.84, CI = 1.37 - 2.45) and diagnosed health conditions (OR = 1.46, CI = 1.11 – 1.91) retained significance in this step, the added variables of depression, anxiety and somatization did not significantly predict greater odds of use of health services. However, with addition of these three variables, the model's fit chi-square value increased by 9.01 (p = 0.03) and Nagelkerke's R^2 also increased to .20. However, the model had a poorer fit as indicated by a lower p value of Hosmer Lemeshow goodness of fit statistic ($\chi^2_{(df=8)}$ = 12.56, p = 0.13) compared to that of the earlier model.

In the third step, the interpersonal variables of acculturation (cultural identity, duration of stay in U.S. and fluency in English), social support, negative beliefs about mental illness, stigma, and the institutional variable of insurance status were entered. While monetary resources continued to significantly predict greater use of general health services (OR = 1.45, CI = 1.02 - 2.07), the variables of age and diagnosed health conditions became

insignificant. The two acculturation variables of duration of stay in U.S. and fluency in English and health insurance significantly predicted use of general health services. Those who had been in the U.S. for more than 10 years were three and half times (OR = 3.54, CI = 1.53 - 8.21) more likely to have used health services than those who had not been in the U.S. for 10 years. A unit change in fluency of English language was associated with one and half times the odds of use of general health services (OR = 1.48, CI = 1.05 - 2.09). Among people without health insurance, the odds of having used general health services were much lower (OR = 0.23, CI = 0.09 − 0.54) than those who had health insurance or had other source of health care. People with health insurance were around three times (OR = 3.11, CI = 1.36 - 7.09) more likely to have used general health services as compared to those without health insurance or with other source of care. Cultural identity was associated with lower odds of use of health services, though this association was only close to the chosen 0.05 level of significance (OR = 0.43 CI = 0.17 - 1.09, p = .08). The variables added in this step substantially increased the model chi square by 100.49 (p = .01) and the model also fit well (Hosmer Lemeshow $\chi^2_{(df=8)}$ = 8.74, p = .37). Nagelkerke's R^2 also increased substantially to .50. In summary, this step revealed that the most important predictors of use of health services were insurance status and acculturation.

The sample size of this study did not permit adding interaction terms between depression, somatization, and anxiety and the variables of acculturation and insurance in a single step. Therefore, before finalizing the model, several regression analyses were conducted separately by adding interaction terms between one predictor (e.g. cultural identity) and the variables of depression, anxiety and somatization in the fourth step. In these analyses moderating effects of cultural identity, duration of stay in U.S. and insurance were examined separately in each model. These analyses revealed that only insurance had a significant moderating effect on the association between depression and use of health services

and somatization and use of health services. Accordingly, the final model was chosen, as shown in step 4 (Table 15). In the final model monetary resources did not remain a significant predictor of use of general health services. The main effects for two acculturation variables were significant. Among those who had lived in the U.S. for more than 10 years, the odds of having used general health services were more than three and half times (OR = 3.77, CI = 1.58 - 9.01) as compared to those who had lived for less than 10 years in U.S..A change of one unit score on the measure of English fluency was associated with around one and half times (OR = 1.64, CI = 1.14 - 2.37) the odds of use than non-use of general health services. The acculturation variable of cultural identity was just close to being significant (OR = 0.38, CI= 0.14 - 1.01, p = 0.052) and therefore cannot be considered as an important predictor in the model.

While the main effects for depression and somatization were not significant, their association with use of general health services was significantly moderated by insurance status. Among those with insurance, a change of one unit score on depression scale was associated with a change of 0.63 (CI = 0.47 - 0.86) fitted odds of general health service use. Similarly, among those without insurance, a unit change on depression scale was associated with lower odds (OR = 0.78, CI = 0.62 - 0.97) of general health service use. However, on the somatization scale the odds of use of general health services were higher among those without insurance (OR = 1.58, CI = 1.15-2.17) and those with insurance (OR= 1.33, CI = 1.01 - 1.76). With addition of the interaction terms, the model chi square increased by 12.56 (p<.01). The final model fit well (Hosmer Lomeshow $\chi^2_{(df=8)}$= 5.56, p = 0.70) and Nagelkerke's R^2 was 0.54.

TABLE XV

SUMMARY OF HIERARCHICAL LOGISTIC REGRESSION ANALYSIS FOR VARIABLES PREDICTING USE OF GENERAL HEALTH SERVICES (N = 320)

Variable	Step 1			Step 2			Step 3			Step 4		
	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio
Constant	-4.95 (1.05)	22.05		-5.40 (1.09)	24.47		-4.18 (2.10)	3.96		-3.97	3.25	
Age	0.50 (0.01)	12.58***	1.05	0.05 (0.02)	12.19***	1.05	0.01 (0.02)	0.16	1.01	0.00 (0.02)	0.04	1.00
Gender (Male)	-0.42 (0.27)	2.36	0.66	-0.35 (0.28)	1.58	0.70	-0.04 (0.36)	0.15	0.96	0.14 (0.38)	0.15	1.16
Education		0.07			0.12			1.89			2.48	
Less than high school	0.02 (0.28)	0.01	1.02	0.01 (0.28)	0.00	1.01	0.60 (0.44)	1.88	1.82	0.67 (0.44)	2.26	1.96
More than high school but less than college graduate	0.09 (0.36)	0.07	1.10	0.12 (0.37)	0.11	1.13	0.19 (0.45)	0.18	1.21	0.06 (0.46)	0.01	1.06
Monetary resources	0.50 (0.14)	13.14***	1.64	0.61 (0.15)	16.90***	1.84	0.37 (0.18)	4.18*	1.45	0.34 (0.19)	3.01	1.40
Health status	0.11 (0.41)	0.73	1.11	0.07 (0.13)	0.25	1.07	0.25 (0.17)	2.25	1.29	0.30 (0.18)	2.85	1.34
Diagnosed health conditions	0.41 (0.13)	9.37**	1.51	0.38 (0.14)	7.34**	1.46	0.20 (0.17)	1.30	1.22	0.15 (0.18)	0.75	1.16

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TABLE XV (Contd.)

SUMMARY OF HIERARCHICAL LOGISTIC REGRESSION ANALYSIS FOR VARIABLES PREDICTING USE OF GENERAL HEALTH SERVICES (N = 320)

Variable	Step 1			Step 2			Step 3			Step 4		
	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio	B (S.E.)	$Wald\ \chi^2$	Odds Ratio
Depression				0.08 (0.05)	2.48	0.93	-0.10 (0.05)	3.37	0.91	0.12 (0.10)	1.62	1.13
Anxiety				0.14 (0.08)	3.14	1.15	0.14 (0.09)	3.11	1.17	0.17 (0.09)	3.42	1.19
Somatization				0.07 (0.04)	2.50	1.07	0.05 (0.05)	0.97	1.05	-0.21 (0.12)	2.89	0.81
Cultural identity							-0.84 (0.47)	3.16	0.43	-0.97 (0.50)	3.78*	0.38
Years in U.S.								8.92**			9.13**	
6-10 years							0.75 (0.48)	2.41	2.12	0.79 (0.50)	2.46	2.20
More than 10 years							0.13 (0.43)	8.71**	3.54	1.33 (0.44)	8.95**	3.77
Fluency in English							0.39 (0.18)	4.97*	1.48	0.50 (0.19)	7.14**	1.64
Social support							0.42 (0.34)	1.47	1.51	0.46 (0.35)	1.71	1.58
Beliefs toward mental illness							-0.02 (0.03)	0.43	0.98	-0.02 (0.03)	0.62	0.98
Stigma							0.16 (0.25)	0.40	1.17	0.18 (0.26)	0.48	1.19

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TABLE XV (Contd.)

SUMMARY OF HIERARCHICAL LOGISTIC REGRESSION ANALYSIS FOR VARIABLES PREDICTING USE OF GENERAL HEALTH SERVICES (N = 320)

Variable	Step 1			Step 2			Step 3			Step 4		
	B (S.E.)	Wald χ^2	Odds Ratio	B (S.E.)	Wald χ^2	Odds Ratio	B (S.E.)	Wald χ^2	Odds Ratio	B (S.E.)	Wald χ^2	Odds Ratio
Health insurance								54.45***			32.88***	
No insurance							-1.49 (0.44)	11.30***	0.23	-1.95 (0.64)	9.21*	0.14
Insurance							1.13 (0.42)	7.27**	3.11	0.91 (0.59)	2.43	2.45
Depression X Insurance											9.30**	
Depression X No insurance										-0.46 (0.16)	8.33**	0.63
Depression X Insurance										-0.25 (0.11)	5.12*	0.78
Somatization X Insurance											8.17*	
Somatization X No insurance										0.46 (0.16)	8.05**	1.58
Somatization X Insurance										0.29 (0.14)	4.23*	1.33

***$p<0.001$ **$p<0.01$, *$p<0.05$.

V. DISCUSSION

In this chapter the results of this study are interpreted in four sections: a) profile of study participants, b) the common mental disorder factor, c) mental health outcomes and d) utilization of health services. In the subsequent sections limitations, implications and conclusions from this study are presented.

A.   Profile of Study Participants

As a minority group SAs have not received adequate attention in past research as they have been included under the umbrella group of Asian American Pacific Islanders and considered a model minority. The sample in this study offered a rare opportunity to study South Asian immigrants of a different profile. Characteristics of the study participants contradicted the myth of model minority. Around half (47.1%) the participants had less than high school level education. The study participants were not fully proficient in English as revealed on the index of English language fluency ($M = 2.36$, $SD = 1.41$ on a scale of 0-4) that measured the ability to speak and understand English. Additionally, as compared to the 14.2% and 5.1% uninsured Asian Indians in age group 18-64 and above age 65 (Huang & Carasquillo, 2008), more than one-third (37.7%) of the participants in this study did not have health insurance. The sample also comprised of relatively old people with a mean age of 61.60 ($SD = 10.62$). The almost equal number of Hindus (44.1%) and Muslims (45.3%) and a greater representation of women (61.3%) added to the diversity within the sample.

Yet, other sample characteristics were similar to those of SAs in the U.S.. Among SAs in the U.S., 89% are Asian Indians and 8% are Pakistanis (SAALT, 2007). Corresponding to these numbers, in this study, 84% were of Indian origin and 13.6% were of Pakistani origin. According to the 2000 census 55% of the foreign born South Asians in the U.S. came to the U.S. between 1990 and 2000 (South Asian American Policy and Research Institute

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(SAAPRI), n.d.). Consistent with the census numbers, 56.8% of the study participants reported of having been in the U.S. for more than 10 years by year 2008.

B.   The Common Mental Disorder Factor

Though depression often co-occurs with anxiety and somatization, past research on mental health of SA immigrants in the U.S. has predominantly focused only on depression. This study addressed this research gap by studying anxiety and somatization along with depression. In particular, somatization was included to understand if it is an important common mental health problem in the study of SA immigrants' mental health and use of health services. To this purpose the relation between these three disorders was studied by conducting an exploratory factor analysis.

The possibility of a single common mental disorder (CMD) factor was indicated by .70 and above correlations between the three disorders. These correlations were much higher than the expected range of .30 - .40 coefficients reported in the WHO cross-cultural study (Simon, Gater, Kisley & Piccinelli, 1996). However, two factors were apparent in principal components analysis. All symptoms of anxiety and depression (except suicidal ideation) and five somatization symptoms loaded on the "depression-anxiety" factor. Three somatization symptoms related to gastrointestinal functioning loaded on the second factor.

The existence of two factors despite the high correlations between the three disorders is partially consistent with earlier research on structure of common mental disorders. The presence of all anxiety and most depression symptoms on a single factor is similar to the structure of the depression-anxiety factor reported in earlier studies (Jacob, Everitt, Patel, Weich, Araya & Lewis, 1998; Kreuger, Chentsova-Dutton, Markon, Goldberg & Ormel, 2003). The only difference in the present study is that all somatization symptoms did not load on to this factor. However, this does not negate the possibility of a factor of CMD as the two

factors in this study were correlated ($r = 0.49$, $p<0.001$). Such a correlation indicates that the two factors may be actually on the same dimension of common mental disorder. Likewise, in the WHO study two separate factors of depression-anxiety and somatization were found for two of the fifteen countries, and yet based on high correlations between these factors (.69 for Germany and .70 for U.S.), the factors were considered to be sub-factors of a broader factor of internalizing disorders (Kreuger et al., 2003). Past research also suggests that the second factor of gastrointestinal somatic symptoms may not associate differently with depression and anxiety compared to the association with all somatic symptoms taken together. Simon et al. (1996) identified four interpretable factors of somatic symptoms (e.g. musculoskeletal factor), and yet none of these factors associated differently with psychological distress (a combined factor of depression and anxiety) as compared to association between all somatic symptoms taken together and psychological distress.

A sole factor represented by all symptoms of three disorders was not supported by this study. However, as the depression-anxiety factor also included somatic symptoms, it can be inferred that the dimensional understanding of common mental disorders was endorsed partially. That five somatization symptoms loaded on the depression-anxiety factor underscores the need to include somatization along with depression and anxiety in research on common mental health problems among SA immigrants. The importance of somatization is also reflected in the fact that 34.8% of participants reported more than four point score on somatic severity scale compared to 24.1% who reported more than four point score on depression severity scale.

C.   Mental Health Outcomes

Considering the possible range of scores on each of the mental health outcome measures (depression: 0-27; anxiety: 0-14; somatization: 0-30) the average scores on

depression (M = 3.04, SD = 4.58), anxiety (M = 1.81, SD = 3.00) and somatization (M = 3.87, SD = 4.21) were on the lower side. This could be because the study was conducted with a community sample which led to a large number of people not reporting any symptoms.

The 12-month prevalence rates for SAs in the NLAAS have been reported as 1.2% (SE = 0.78) for any affective disorder (major depression and dysthymia), 0.8% (SE = 0.56) for subthreshold affective disorder, 3.3% (SE = 1.30) for anxiety disorder and 5.9% (SE = 1.77) for subthreshold anxiety disorders (Masood, Okazaki & Takeuchi, 2009). Extrapolating from the NLAAS 12-month rate of subthreshold affective disorder, the percentage of people with mildly severe symptoms of depression can be expected to be around 1- 2%. However, in this study a much higher percentage (24.1%) had a depressive symptom severity score indicating at least a mild level of symptom severity (more than four point score on the depression scale). This discrepancy could be because of different reasons: a) depressive symptoms over the past two weeks were measured in this study, b) the probability sample of 164 in the NLAAS was much younger (M = 38.7, SE = 0.78) as compared to the current sample and c) scores on depression in this study reflect the severity of symptoms and not the number of symptoms needed to qualify for a diagnosis of an affective disorder. On the other hand, the 24.1% of people with at least mild depressive symptoms is comparable to 20-30% prevalence rate of common mental disorders reported in developing countries (Patel & Kleinman, 2003). When compared with rates of depression reported for aging SA immigrants in earlier studies, the finding of 24.1% with mildly severe depressive symptoms is similar to the 21.4% reported among aging SAs in Canada (Lai & Surood, 2008), and lesser than the 50% reported for Indian elderly immigrants in New York (Mui & Kang, 2006). The anxiety scores in this study could not be compared with the national prevalence as norms for

determining severity of anxiety have not yet been reported for PHQ anxiety scale used in this study.

In the case of somatization, none of past research with SAs has estimated the prevalence of somatic symptoms or severity. However, a greater percentage (34.1%) of participants reporting at least mild level of somatic severity (those with greater than four point score on somatization scale) as compared to 24.1% reporting mild depression is consistent with earlier research suggesting that SA immigrants are likely to report somatic symptoms more than psychological symptoms (Karasz, Dempsey & Fallek, 2007).

1.   Predictors of Mental Health Outcomes

The demographic predictor of adequacy of monetary resources emerged as the strongest predictor of each of the mental health outcomes. Lower perceived adequacy of monetary resources was associated with higher scores on depression, anxiety and somatization. This is consistent with earlier reports that poverty and income related factors are associated with higher rates of common mental disorders (Fryers, Melzer & Jenkins, 2002; Patel & Klienman, 2003). The negative association of employment with depression scores is also consistent with past epidemiological research (Fryers, Melzer, Jenkins & Brugha, 2005). Gender was a significant predictor of depression with men having lower rates of depression than women. This was not unexpected as women are known to suffer more from depression (Kessler, Berglund, Demler, Jin, Merikangas & Walters, 2005). Lower level of education has been reported to be most consistently associated with higher rates of common mental disorders (Patel & Klienman). An unexpected finding was that compared to people with higher than graduate level education, those with less than graduate but more than high school level education were likely to have lower scores on depression and anxiety. This could be because among the third wave SA immigrants (those who immigrated after 1985)

many are employed in lower-wage jobs (SAALT, 2007) that are suitable for people with

education more than high school but not more than graduate level. Thus people with this level

of education may be employed and hence less prone to depressive and anxiety symptoms.

Nonetheless, this finding should be interpreted with caution as it could be a sample specific

finding. Taken together, the findings on demographic predictors contradict the myth of the

model minority among SAs. It is evident that SAs of a lower socio-economic status have

more depressive and anxiety symptoms.

A broad objective of this study was to examine the role acculturation and social

support in predicting distress due to CMD. Drawing from the ecological perspective

acculturation was conceptualized as a dynamic chronosystemic factor and therefore three

aspects of acculturation were studied: cultural identity, duration of stay in the U.S. and

fluency in English. The finding that cultural identity did not predict depression and anxiety is

different from earlier research that has shown that among Asian Indians a bi-cultural or

Western cultural identity is associated with lower levels of common mental health problems

(Diwan, Jonalgadda & Balaswamy, 2004; Mehta, 1998), and having stronger SA cultural

values is associated with greater likelihood of being depressed (Lai & Surood, 2008). It is

also noteworthy that in the case of somatization a higher score on the SL-ASIA scale

predicted a greater severity of somatic symptoms. A possible explanation for both these

findings could be that participants in this study had a SA cultural identity as indicated by the

mean score on 1.93 (SD = 0.45) within a possible range of 1-5 (1 = SA cultural identity and 5

= Western cultural identity). Thus, participants with a score higher than two standard

deviations also did not have a score of three which indicates bi-cultural identity and none of

the participants had a score of five which indicates Western cultural identity. This suggests

that the association was actually between a SA cultural identity and greater somatization,

which is consistent with past literature suggesting that SAs acknowledge somatic symptoms of distress rather than psychological symptoms (Raguram, Weiss, Channabasavana & Devins, 1996). It may also explain why the variable of cultural identity was not a significant predictor of anxiety and depression, both predominantly measured as psychological symptoms of CMD.

It is straightforward to understand how fluency of English predicted scores on depression. Mui & Kang (2006) have conceptualized proficiency in English as a coping resource that represents the behavioral efforts to cope with the host culture. Mui and Kang's concept of proficiency in English is similar to the conceptualization of fluency in English in this study. With limited English fluency, SA immigrants may get further isolated which could make them feel more depressed.

More than ten years of stay in the U.S. was associated with higher anxiety scores. This finding is different from that of study by Mehta (1998), in which duration of stay in the U.S. was not a significant predictor of mental distress. In Mehta's study a mental health was measured with a composite index of psycho-physiological symptoms, acculturative stress and life satisfaction and hence the association of duration of stay with anxiety alone may not have become evident. The reason for increase in anxiety with more than 10 years of stay in the U.S. needs to be explored in further research. It has been noted that older SA immigrants face increasing health problems, and may have difficulties in getting health care due to legal issues associated with getting health care for immigrants and readiness of SA caregivers to get social services for their aging parents (Nandan, 2007). These health-related issues coupled with prolonged feelings of isolation in a different cultural context could possibly explain the positive association between longer duration of stay and anxiety.

Higher social support scores predicted lower scores on depression and anxiety. This indicated that among SA immigrants, perceived sense of support predicts lesser distress due to CMD. This confirms the finding of the qualitative study with SAs in Canada in which women attributed their distress to loss of support after immigration (Choudhry, 2001) and is consistent with research conducted with SA immigrants in the UK (Williams, Kooner, Steptoe & Kooner, 2007). The role of social support as a modifier of effect of acculturation on anxiety and somatization was not supported by findings of this study. Only in the model for depression, one interaction term between "more than 10 years of stay in U.S." and social support was significant but added little to the explained variance. This interaction indicated a trend suggesting that in the absence of adequate support, a longer duration of stay in the U.S. may be associated with experience of depressive symptoms.

The study findings underscore the importance of demographic predictors in research on mental health of SA immigrants. In terms of the strength of influence, demographic factors were much more important than acculturation and social support in each of the regression models explaining depression, anxiety and somatization. Demographic factors explained around 11-13% of the variance while acculturation and social support together made a small addition of 2-4% in each of the regression models.

In terms of theory, this study's findings confirmed that among older SA immigrants' symptoms of depression and anxiety are influenced by both individual and environmental factors. In addition to the demographic factors which are usually considered *individual or microsystemic* factors, the *mesosystemic* variable of social support and the dynamic *(chronosystemic)* acculturation variables of fluency in English and duration of stay have independent roles in predicting symptoms of depression and anxiety in SA immigrants. The importance of fluency in English and social support should not be underestimated as these

can easily become important markers for intervention programs for mental health of SA immigrants.

D.   Health Service Utilization

A surprising finding of this study was that though more than one-fourth of the participants in this study had at least mildly severe symptoms of somatization or depression, only 13 participants (3.9%) had utilized mental health services. Though this rate of mental health service use is low, it is comparable with rates of mental health service use reported for other minority immigrant groups. Only 5% of Ethiopian immigrants in Canada (Fenta, Hyman & Noh, 2006), and 1.4% of Chinese Americans use mental health services (Abe-Kim, Takeuchi & Hwang, 2002). This finding also indicates the need for further research to understand the reasons behind SAs' underutilization of health services. Promising research in this area suggests that SAs may have a different cultural understanding of their illness which may determine different choices of dealing with their depressive or medically unexplained symptoms (Hussain & Cochrane, 2002; Karasz & Dempsey, 2008). Depending upon how SAs perceive their mental health problems, they may rely on alternatives like seeking help from traditional healers or community (Hussain & Cochrane, 2002), and make efforts to deal with medically unexplained symptoms by supplementing diet with high protein or expensive food and medicines to restore strength (Karasz & Dempsey, 2008).

The low rate of mental health service use could also be a reflection of overuse of general health services for mental health problems instead of mental health services in the American health care system (Wang, Demler, Olfson, Pincus, Wells & Kessler, 2006; Wang, Lane, Olfson, Pincus, Wells & Kessler, 2005). This study aimed to understand whether depression, anxiety and somatization predicted general health service use of SA immigrants. Using an ecological framework it examined whether different environmental factors

influenced use of general health services and moderated the association between mental health problems and general health service use.

The regression analysis revealed that demographic variables were not significant predictors of use of general health services. Of the interpersonal variables of acculturation and social support, the acculturation indicators of fluency in English and more than 10 years of stay in U.S. independently influenced general health service use even after taking into consideration the three mental health variables, the intrapersonal variables of negative beliefs about mental illness and stigma and the institutional variable of insurance. The higher odds of general health service use among participants who had stayed in the U.S. for more than 10 years is not surprising as immigrants become eligible for government sponsored health insurance after five years of stay in the U.S. Years lived in U.S. has earlier been reported to be positively associated with health service utilization among Asian Indian immigrants (Ryu, Young & Kwak, 2002). The greater odds of general health service use associated with fluency in English language could be because SA immigrants with better fluency in English may find it easier to access the complex health care system and also communicate their needs better with the their health care providers. This finding is also consistent with evidence that Chinese Americans underutilize formal mental health services when they perceive discrimination due to their inability to speak English or speaking English with a different accent (Spencer & Chen, 2004). Also, it is known that among Asian immigrants who do not know English, not having a provider from one's ethnicity and speaking his/her language is associated with poor treatment outcomes for mental health problems (Sue, Fujino, Hu, Takeuchi & Zane, 1991). There is no single reason to explain why social support was not associated with use of general health services. However, a plausible explanation could be that global sense of support, and not specific functional support from friends, families or the

strength of social network was measured in this study. A sense of support may be important for one's mental health (as found in this study for depression and anxiety), but not necessarily related to the actual behavior of seeking services. Nevertheless, there is also evidence that social support may not be related to use of health services among immigrants (Abe-Kim, Takeuchi & Hwang, 2002).

Negative beliefs about mental illness and stigma were two socio-cultural factors conceptualized as intrapersonal variables. It is encouraging to see that negative beliefs about mental illnesses and stigma were not associated with use of health services even when depression, anxiety and somatization were included in the regression analysis. This indicates changing attitudes among SAs about treatment for mental health problems. In the case of stigma, it may also be true that use of general health services is acceptable and not stigmatizing, whereas using mental health service is seen as stigmatizing.

The institutional factor of health insurance status had an overarching effect on general health service use of SA immigrants. Even after controlling for demographic variables, diagnosed health conditions and mental health variables, it was the strongest predictor before entering the interaction terms; people with insurance had three times (OR = 3.11) the odds of using general health service and people without health insurance had considerably lower odds (OR = 0.23) of having used general health services.

The most interesting finding of this study was that the association of depression and somatization with general health service could be explained only after entering interaction terms with insurance variables. Regardless of the health insurance status of a person, depression was associated with lower odds of general health service use. This finding is consistent with earlier literature reports of foreign born minority immigrants not perceiving a need to use health services for depressive symptoms (Huang, Wong, Ronzio & Yu, 2007).

The greater odds of general health service use associated with somatization is also consistent with earlier research with other immigrant groups (Fenta, Hyman & Noh, 2006; Kung & Lu, 2008), and research on association between somatization and use of health services (Barsky, Orav & Bates, 2005).

A comparison of the odds ratios for the insured and the uninsured shows that for depression the odds of health service are greater among those with insurance (OR = 0.78) as compared to those without insurance (OR = 0.63). This is self-explanatory in that those with insurance are more likely to seek general health services for depressive symptoms than those without insurance. However, in the case of somatization the odds of general health service use are higher for those without insurance (OR = 1.58) than for those with health insurance (OR = 1.33). Reasons for why SAs without insurance are more likely to use general health services with an increase in somatic symptoms than those with insurance are not clear and need to be explored in further research.

As somatization was conceptualized only on the basis of number of symptoms and severity (Gucht & Fischler, 2001), and as this was a cross-sectional study, no concrete explanations for the association of somatization with use of general health services can be offered. Drawing from earlier studies (Patel, Pareira & Mann, 1998; Raguram, Weiss, Channabasavanna & Devins, 1996) a possible explanation is that participants in this study may be considering somatic symptoms important than psychological symptoms to seek health services because many do not yet suffer from a high severity of psychological symptoms and seeking general health services for somatic symptoms is in the repertoire of many. Several other theoretical explanations that provide for a culturally sensitive understanding of somatization have been offered (Kirmayer & Young, 1998). Future research using a

theoretically more evolved conceptualization of somatization can offer explanations for this association.

Theoretically, the findings of this study established that the institutional variable of insurance has the most powerful influence on SA immigrants' use of health services. Additionally, it also confirmed that interpersonal acculturation variables of fluency in English and duration of stay in the U.S. influenced SAs' use of general health services rather than socio-cultural (intrapersonal) variables of negative beliefs about mental illness. Literature on SAs has attributed their underutilization of health services for mental health problems to barriers of negative beliefs and stigma. It is the practical problems caused by difficulties in language and issues with access to health care due to lack of insurance that obstruct SA immigrants' utilization of general health services for mental health problems. This finding should be regarded cautiously as the association between negative beliefs about mental illnesses, stigma and use of mental health services could not be examined in this study due to the small number of participants who had used mental health services. Additionally, the study confirms that the socio-culturally relevant mental health variable of somatization is important in understanding SA immigrants' general health service use.

E.   **Limitations of the Study**

An important limitation of this study is its descriptive, correlational and cross-sectional design. Therefore, the findings about associations between predictor and outcome variables should be interpreted as relationships and not causal associations. As the study involved analysis of secondary data, research questions that could be addressed by this study were restricted by the nature of the sample. As the original study used a non-probability sampling strategy and had a moderate sample size of 331 respondents findings of this study can be generalized to a limited extent. An important limitation is that the sample consisted of

people above age 40 and thus did not cover the full range of adult SA immigrants. The measures used in the study and other sample characteristics also imposed some limitations. For example, it would have helped if the original study had questions about reasons for non-use of mental health services. Also, only perceived adequacy of monetary resources had to be used as a measure of participant's economic status as data on family income was missing for a substantial number of participants. Though the measures used in this study were translated using a rigorous scientific method, these may not be accurate as they were not developed for the SA population with an emic approach (Menon, Szalacha & Prabhughate, manuscript submitted for publication). Another limitation of the current study is that the language of interview was not used as a predictor variable. It is possible that study participants differed on the outcome variables according to the language they were interviewed in.

F.   Implications of the Study

1.   Implications for Social Work Practice

The findings of this study call for culturally sensitive social work practice with SA immigrants. In clinical practice with SA immigrants practitioners need to sensitively approach SA clients without falling prey to the myth of model minority. They need to be aware of the importance of somatic symptoms in SA immigrants' experience of mental health problems. In particular, practitioners need to be alert to reports of somatic symptoms also and be mindful that it would be appropriate to elicit more information about psychological symptoms of distress as these may not be reported voluntarily.

The study's findings indicate that many SA immigrants may be experiencing few symptoms of depression, anxiety and somatization and thus may qualify for sub-threshold levels of these disorders. There is growing evidence that such subthreshold symptom levels can negatively impact the day-to-day functioning of people (Judd, Schettler & Akiskal,

2002). Social work interventions designed for older SA immigrants can help deal with these debilitating symptoms. Such interventions can be community-centered interventions that can help increase social support and social networks of SA immigrants. These interventions can also specifically include content to enhance English language skills and provide knowledge of the U.S health care system. On the other hand social work practitioners and administrators working in different health and welfare systems need to be oriented to the SA cultural background of their clients in order to provide appropriate mental health services or make suitable referrals.

2.   Implications for Social Work Education

This study has added to the knowledge on mental health issues of the relatively understudied minority group of SA immigrants. This knowledge can be used in courses on human behavior and development, human behavior and social environment and mental health practice to impart knowledge and skills in culturally sensitive and competent practice with SA immigrants. Particularly, findings of this study provide evidence that contradicts the existing myth of SAs being a model minority and also highlights the barriers that can hinder SAs' use of general health services. This empirical evidence adds to current knowledge on evidence-based practice and thus should be incorporated in relevant social work curricula.

The study has theoretical relevance for social work education because it was conducted adopting the ecological perspective. This study illustrates how different ecological systems influence human behavior. The study makes a modest contribution by empirically validating the ecological theory. This knowledge can be incorporated in the curriculum on social work theory courses.

3.   Implications for Social Work Advocacy

The core value of social work is social justice and from that its philosophy demands that issues of minority communities are highlighted. The study highlights two issues that have direct relevance to social justice. It has shown that among SAs inadequacy of monetary resources is associated with increased symptoms of CMD and that lack of insurance is a barrier to seeking health care. A good proportion of participants in this study had stayed in the U.S. for more than 10 years and still did not have health insurance. These findings are particularly salient in the current debate on whether government sold health insurance should be available and particularly whether immigrants in the U.S. should be provided health care insurance. Social workers doing health care advocacy can utilize these findings. Specifically, the study indicates that advocates can demand culturally sensitive services and health insurance for older SA immigrants as their economic difficulties are directly associated with increased mental health problems and lack of access to health services.

4.   **Implications for Research**

This study has established that somatization should be included in addition to depression and anxiety in research on SA immigrants' mental health. A logical extension of this study would be research conducted with a large probability sample and longitudinal design. Such research can verify whether the symptom levels found in this study are stable and also the role of somatization vis-à-vis depression and anxiety.

More than ten years of stay in the U.S. was associated with increase in anxiety symptoms among older SAs in this study. An increase in anxiety is often associated with increase in stress and other mood symptoms. Longitudinal research is needed to verify and understand whether stress and anxiety levels in older SA immigrants increase with passage of time.

Among the predictors studied, adequacy of monetary resources emerged to be the most important predictor of common mental disorders in this study. Whether this association reflects the real income and monetary resources available to SA immigrants needs to be examined in further research. Further research also needs to explore how SA immigrants without insurance mitigate their mental health problems.

Though earlier research with SAs has suggested that cultural identity of SAs may be an important predictor of their mental health and health service use, this study's findings in this regard were not conclusive. A possible reason for this could be the use of the SL-ASIA measure which measures cultural identity on a continuum of Asian to Western cultural identity. It may be helpful if in future the perceived difference between cultures and the rising dissonance or stress involved in acculturating to a new environment is studied rather than cultural identity.

Although around half the participants in this study had used general health services in the past three months very few had utilized mental health services. This indicates the possibility that primary care physicians may not be addressing mental health needs and making referrals to mental health services. In this context following research questions can be addressed in future: Why do SA immigrants underutilize mental health services? Are SA immigrants under-diagnosed or not adequately referred to mental health providers by primary care providers?

G.   Conclusions

South Asian immigrants are likely to report somatization symptoms along with symptoms of depression and anxiety. Symptoms of somatization are related to depression and anxiety and therefore excluding them in research and practice would be inappropriate. Not all SA immigrants fit the bill of model minority. South Asian immigrants who have inadequate

monetary resources, perceive lower levels of social support, or are not proficient in English are likely to experience greater number of depressive symptoms.

The rate of mental health service use among SA immigrants is very low. Older SA immigrants who have better fluency in English and have lived in the U.S. for more than ten years are more likely to use general health services. They are also more likely to use general health services for symptoms of somatization but less likely to use these services for depressive symptoms. Not having health insurance can have an overarching negative effect on SA immigrants' use of general health services.

APPENDICES

APPENDIX A

QUESTIONS AND MEASURES USED IN THIS STUDY

Self-reported Health Status

1. How do you see your health status?

   ☐ Excellent   ☐ Very good   ☐ Good   ☐ Fair   ☐ Poor

Diagnosed Health Conditions

From the above diseases, have you been told by a doctor that you have any of them?

	Yes	No	Don't Know
2. Breast cancer			
3. Cervical cancer			
4. Colorectal cancer			
5. Diabetes			
6. Heart attack			
7. High blood pressure			
8. Stroke			

Patient Health Questionnaire (PHQ)

These questions are about how you feel and how things have been with you during the **past 4 weeks.**

PHQ Somatization Scale

During the **last 4 weeks,** how much have you been bothered by any of the following problems?	Not bothered	Bothered a little	Bothered a lot
9. Stomach pain			

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APPENDIX A (continued)

During the **last 4 weeks,** how much have you been bothered by any of the following problems?	Not bothered	Bothered a little	Bothered a lot
10. Back pain			
11. Pain in your arms, legs, or joints (knees, hips, etc.)			
12. Menstrual cramps or other problems with your periods			
13. Pain or problems during sexual intercourse			
14. Headaches			
15. Chest pain			
16. Dizziness			
17. Fainting spells			
18. Feeling your heart pound or race			
19. Shortness of breath			
20. Constipation, loose bowels, or diarrhea			
21. Nausea, gas, or indigestion			

PHQ Depression Scale

Over the **last 2 weeks**, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
22. Little interest or pleasure in doing things				
23. Feeling down, depressed, or hopeless				
24. Trouble falling or staying asleep, or sleeping too much				
25. Feeling tired or having little energy				

APPENDIX A (continued)

Over the **last 2 weeks**, how often have you been bothered by any of the following problems?				
26. Poor appetite or overeating				
27. Feeling bad about yourself — or that you are a failure or have let yourself or your family down				
28. Trouble concentrating on things, such as reading the newspaper or watching television				
29. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual				
30. Thoughts that you would be better off dead or of hurting yourself in some way				

PHQ Anxiety Scale*

Over the **last 4 weeks,** how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days
31. Feeling nervous, anxious, on edge, or worrying a lot about different things			
32. Feeling restless so that it is hard to sit still.			
33. Getting tired very easily			
34. Muscle tension, aches, or soreness			
35. Trouble falling asleep or staying asleep			
36. Trouble concentrating on things, such as reading a book or watching TV			
37. Becoming easily annoyed or irritable			

* Only questions on generalized anxiety were used in this study. Questions on panic from the PHQ anxiety scale are not shown.

APPENDIX A (continued)

Beliefs Toward Mental Illness Scale

	Completely Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Completely Agree
38. The term "Psychological Disorder" makes me feel embarrassed.						
39. A person with psychological disorder should have a job with minor responsibilities.						
40. I am afraid of what my boss, friends, and others would think if I were diagnosed as having a psychological disorder.						
41. It might be difficult for mentally-ill people to follow social rules such as being punctual or keeping promises.						
42. I would be embarrassed if people knew that I dated a person who once received psychological treatment.						

APPENDIX A (continued)

	Completely Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Completely Agree
43. A person with psychological disorder is less likely to function well as a parent.						
44. I would be embarrassed if a person in my family became mentally ill.						
45. Mentally ill people are unlikely to be able to live by themselves because they are unable to assume responsibilities.						
46. Most people would not knowingly be friends with a mentally-ill person.						
47. I would not trust the work of a mentally-ill person assigned to my work team.						
48. Psychological disorder is recurrent						

APPENDIX A (continued)

	Completely Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Completely Agree
49. Individuals diagnosed as mentally ill will suffer from its symptoms throughout their life.						
50. People who have once received psychological treatment are likely to need further treatment in their future.						
51. I do not believe that psychological disorder is ever completely cured.						
52. The behavior of people who have psychological disorders is unpredictable.						
53. Psychological disorder is unlikely to be cured regardless of treatment.						

APPENDIX A (continued)

Stigma Scale for Receiving Psychological Help

These questions are about how you feel about seeking help for mental health problems from a mental health practitioner, i.e. a psychologist or counselor or psychiatrist. Indicate the extent to which you agree or disagree with the statements.

	Completely Disagree	Slightly Disagree	Slightly Agree	Completely Agree
62. Seeing a mental health practitioner for emotional or interpersonal problems carries social stigma.				
63. It is a sign of personal weakness or inadequacy to see a mental health practitioner for emotional or interpersonal problems.				
64. People will see a person in a less favorable way if they come to know that he/she has seen a mental health practitioner.				
65. It is advisable for a person to hide from people that he/she has seen a mental health practitioner.				
66. People tend to like less those who are receiving professional psychological help.				

Questions on Use of Mental Health Services

67. In the last 12 months did you visit a mental health practitioner such as a psychiatrist / psychologist / psychiatric nurse / social worker / counselor for your mental health problems or problems related to your use of alcohol?

   ☐Yes   ☐No

68. In the last 12 months did you visit any other medical doctor such as a general physician / family doctor / other specialist (e.g. cardiologist) for your mental health problems or problems related to your use of alcohol?

   ☐ Yes   ☐ No

APPENDIX A (continued)

Questions on Use of General Health Services

69. Is there any one particular doctor that you consider to be your regular or family doctor?

☐ Yes   ☐ No   **If No skip Q. 70**

70. When was the last medical visit with your regular personal doctor?

Less than 1 month ago	1 to 3 months ago	4 to 6 months ago	7 months to year ago	More than 1 year ago
☐	☐	☐	☐	☐

Sense of Support Scale

	Not at all true	Somewhat true	Mostly true	Completely True
71. I participate in volunteer/service projects.				
72. I have meaningful conversations with my parents and/or siblings.				
73. I have a mentor(s) in my life I can go for support/advice.				
74. I seldom invite others to join me in my social and/or recreational activities.*				
75. There is at least one person I feel a strong emotional tie with.				
76. There is no one I can trust to help solve my problems.*				
77. I take time to visit my neighbors.				
78. If a crisis arose in my life, I would have the support I need from family or friends.				
79. I belong to a club (eg. sports, hobbies, support group, special interests)				
80. I have friends from work that I see socially (eg. movie, dinner, sports, etc).				

APPENDIX A (continued)

		Not at all true	Somewhat true	Mostly true	Completely True
81.	I have friendships that are mutually fulfilling.				
82.	There is no one I can talk to when making important decisions in my life.*				
83.	I make an effort to keep in touch with friends.				
84.	My friends and family feel comfortable asking me for help.				
85.	I find it difficult to make new friends.*				
86.	I look for opportunities to help and support others.				
87.	I have a close friend(s) whom I feel comfortable sharing deeply about myself.				
88.	I seldom get invited to do things with others.*				
89.	I feel well supported by my friends or family.				
90.	I wish I had more people in my life that enjoy the same interests and activities as I do.*				
91.	There is no one that shares my beliefs and attitudes.*				

* Reverse code item.

APPENDIX A (continued)

Monetary Resources Subscale from the Family Resources Scale

These are few questions about your family's resources.

To what extent does your family have the following?	Does Not Apply	Not at all adequate	Sometimes Adequate	Usually Adequate	Almost Always Adequate
92. Good job for yourself or spouse/partner					
93. Money to buy things for self					
94. Money for family entertainment					
95. Money to save					
96. Travel/ Vacation					

SL-ASIA Scale (Adapted for South Asians)

Note: Item # 98 and 99 are not from the SL-ASIA scale. These items were used in the current study to compute the index of fluency in English.

97. What language can you speak?

  1. South Asian only (like Urdu, Hindi, Gujarati, etc) | Go to 100 |
  2. Mostly Asian some English
  3. Asian and English both equally well
  4. Mostly English and some South Asian
  5. Only English | Go to 100 |

98. How well do you understand English?

  □ Well   □ Not too well   □ Not at all

99. How well do you speak English?

  □ Well   □ Not too well   □ Not at all

APPENDIX A (continued)

100. What language do you prefer?

    1. South Asian only (like Urdu, Hindi, Gujarati, etc)
    2. Mostly South Asian some English
    3. Asian and English both equally well
    4. Mostly English and some South Asian
    5. Only English

101. How do you identify yourself?

    1. South Asian
    2. Asian
    3. Asian American
    4. Indian American, Pakistani American, Bangladeshi America
    5. American

102. What identification does (did) your mother use?

    1. South Asian
    2. Asian
    3. Asian American
    4. Indian American, Pakistani American, Bangladeshi America
    5. American

103. What identification does (did) your father use?

    1. South Asian
    2. Asian
    3. Asian American
    4. Indian American, Pakistani American, Bangladeshi America
    5. American

104. What was the ethnic origin of the friends and peers you had, as a child up to age of 6?

    1. Almost exclusively South Asians, Asian-Americans
    2. Mostly South Asians, Asian-Americans

APPENDIX A (continued)

3. About equally South Asian groups and Anglo groups
4. Mostly Anglos, Blacks, Hispanics or other non-South Asian ethnic groups
5. Almost exclusively Anglos, Blacks, Hispanics, or other non- South Asian ethnic groups

105. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?

   1. Almost exclusively South Asians, Asian-Americans
   2. Mostly South Asians, Asian-Americans
   3. About equally South Asian groups and Anglo groups
   4. Mostly Anglos, Blacks, Hispanics or other non-South Asian ethnic groups
   5. Almost exclusively Anglos, Blacks, Hispanics, or other non- South Asian ethnic groups

106. Whom do you now associate with in the community?

   1. Almost exclusively South Asians, Asian-Americans
   2. Mostly South Asians, Asian-Americans
   3. About equally South Asian groups and Anglo groups
   4. Mostly Anglos, Blacks, Hispanics or other non-South Asian ethnic groups
   5. Almost exclusively Anglos, Blacks, Hispanics, or other non- South Asian ethnic groups

107. If you could pick, whom would you prefer to associate with in the community?

   1. Almost exclusively South Asians, Asian-Americans
   2. Mostly South Asians, Asian-Americans
   3. About equally South Asian groups and Anglo groups
   4. Mostly Anglos, Blacks, Hispanics or other non-South Asian ethnic groups
   5. Almost exclusively Anglos, Blacks, Hispanics, or other non- South Asian ethnic groups

APPENDIX A (continued)

108. What is your music preference?

1. Only South Asian music (for example, Indian, Pakistani, Bangladeshi)
2. Mostly South Asian
3. Equally South Asian and English
4. Mostly English
5. English only

109. What is your movie preference?

1. South-Asian language movies only
2. South Asian-language movies mostly
3. Equally South Asian and English language movies
4. Mostly English movies
5. English language movies only

110. Where were you raised?

1. In South Asia only
2. Mostly in South Asia, some in U.S.
3. Equally in South Asia and U.S.
4. Mostly in U.S., some in South Asia
5. In U.S. only

111. What contact have you had with Asia?

1. Raised one year or more in South Asia
2. Lived for less than one year in South Asia
3. Occasional visits to South Asia
4. Occasional communications (letters, phone call, etc.) with people in South Asia
5. No exposure or communications with people in South Asia

112. What is your food preference at home?

1. Exclusively South Asian food

APPENDIX A (continued)

2. Mostly South Asian food, some American
3. About equally South Asian and American
4. Mostly American food
5. Exclusively American food

113. What is your food preference at restaurants?

1. Exclusively South Asian food
2. Mostly South Asian food, some American
3. About equally South Asian and American
4. Mostly American food
5. Exclusively American food

114. Do you read:

1. Only a South Asian language?
2. A South Asian language better than English?
3. Both South Asian and English equally well?
4. English better than a South Asian language?
5. Only English?

115. Do you write:

1. Only a South Asian language?
2. A South Asian language better than English?
3. Both South Asian and English equally well?
4. English better than a South Asian language?
5. Only English?

116. If you consider yourself a member of the Asian group (South Asian, Asian, Asian-American, Chinese-American, etc. whatever term you prefer), how much pride do have in this group?

1. Extremely proud
2. Moderately proud
3. Little pride

APPENDIX A (continued)

4. No pride but do not feel negative toward group
5. No pride but do feel negative toward group

117. How would you rate yourself?

1. Very South Asian
2. Mostly South Asian
3. Bicultural
4. Mostly Westernized
5. Very Westernized

118. Do you participate in South Asian occasions, holidays, traditions, etc.?

1. Nearly all
2. Most of them
3. Some of them
4. A few of them
5. None at all

Duration of Stay in US

119. How long have you been living in the United States? (Check one only)

☐ Less than a year ☐ 1 - 5 years ☐ 6 -10 years ☐ More than 10 years

Insurance Status

120. What is the source of your health insurance?

☐ No health insurance

☐ Free health care (free clinics)

☐ Self-pay

☐ Through work (spouse's or own)

☐ Medicare

☐ Medicaid

☐ Other (please specify):_____

APPENDIX A (continued)

Demographic Questions

121. What is your country of birth? _____

122. How old are you? _____

123. What is your marital status?

    ☐ Currently married

    ☐ Single

    ☐ Not married, living with partner

    ☐ Divorced

    ☐ Separated

    ☐ Widowed

124. What is your religious preference?

    ☐ Muslim

    ☐ Christian

    ☐ Hindu

    ☐ Jain

    ☐ Sikh

    ☐ No religion

    ☐ Other (please fill in):_____

125. What is the highest level of formal education you have completed?

    ☐ Less than high school graduate

    ☐ High school graduate

    ☐ Some college

    ☐ College graduate

    ☐ Professional degree

APPENDIX A (continued)

☐ Post-Graduate training

☐ Other (please fill in) Degree _____

126. Are you currently working for pay?

☐ Yes – Full time

☐ Yes – Part time

☐ No

APPENDIX B

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Exemption Granted

May 21, 2009

Abhijit Prabhughate, MA, MPhil
Jane Addams School of Social Work
1040 W Harrison
M/C 309
Chicago, IL 60612
Phone: (312) 996-2532 / Fax: (312) 996-2770

RE: **Research Protocol # 2009-0457**
"South Asian Immigrants' Mental Health and Use of Health Services"

Dear Abhijit Prabhughate:

Your Claim of Exemption was reviewed on May 20, 2009 and it was determined that your research protocol meets the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)]. You may now begin your research.

Exemption Period: May 20, 2009 – May 19, 2012

Your research may be conducted at UIC and with existing, de-identified data only.

The specific exemption category under 45 CFR 46.101(b) is:
(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects

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APPENDIX B (continued)

still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

1. <u>Amendments</u> You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. <u>Record Keeping</u> You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. <u>Final Report</u> When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

Please be sure to:

→Use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Charles W. Hoehne
Assistant Director, IRB # 2
Office for the Protection of Research Subjects

Enclosure(s): None

cc: Creasie Finney Hairston, Jane Addams School of Social Work, M/C 309
Mark A. Mattaini, Jane Addams School of Social Work, M/C 309

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