PREDICTORS OF PARTIAL HOSPITALIZATION ATTENDANCE BY U.S ADULTS WITH MENTAL ILLNESS

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Abstract

A partial hospitalization program (PHP) is a transitional stage of mental health treatment between inpatient and outpatient care. One of the major advantages of PHP is that it is a cost-effective treatment for patients with mental illness especially when compared to inpatient hospitalization. Patients with mental illness often have poor adherence to treatment. Patients who do not attend PHP regularly may be affected negatively because they miss part of their treatment. The lack of continuity in treatment may lead to exacerbation of symptoms, relapse, and unplanned discharge. This would result in overutilization of inpatient services and ultimately increase in the total cost of mental health treatment. Several predictors of PHP attendance were identified in previous research. However, these factors were chosen arbitrarily without theoretical reasoning. Consequently, the theory of planned behavior (TPB) was used to guide this study for the purpose of determining the predictors of intention to attend PHP and actual PHP attendance rate.

This study was conducted using a correlational design. The sample was recruited from a PHP in a 500-bed urban hospital in the Midwest of the U.S. Sixty-five subjects were enrolled in this study. The sample consisted mainly of relatively young Caucasians who had major depression. Subjects completed a survey that measured their attitude
toward PHP attendance, subjective norm, perceived behavioral control, and intention to attend PHP. PHP attendance rate, defined as the ratio of the actual attended days to the total scheduled days, was determined by tracking presence at the PHP each day. Path analysis was used to trace the direct and indirect effect of the TPB constructs.

Subjects had a very high attendance rate (84% of participants had 80% or higher attendance rate), and this reflects a high adherence level to this type of mental health treatment. The findings supported the utility of the TPB in explaining and predicting intentions to perform behaviors and actual behaviors. Patients’ attitude toward attending PHP was the strongest predictor of intention to attend PHP, while perceived behavioral control was the strongest predictor of the PHP attendance rate. Further research is needed to examine the effect of particular demographic, clinical, and personal factors on mental health treatment attendance.
Chapter 1

INTRODUCTION
Introduction

Approximately 43.7 million or 18.6% of adult Americans suffer from any mental illness (AMI) (National Institute of Mental Health [NIMH], 2012). Among those, 9.6 million (4.1%) adults have serious mental illness (SMI) (NIMH, 2012). It is estimated that half of adult Americans will develop at least one mental illness during their life (Centers for Disease Control and Prevention [CDC], 2011). The negative impacts of mental illness are devastating in terms of all aspects of health and financial cost. For example, the direct cost of treatment for people with SMI is approximately $100 billion, while the indirect cost accounts for approximately $193 billion in lost earnings in the USA each year (Insel, 2008; National Alliance on Mental Illness [NAMI], 2013). Also, people with SMI die 25 years earlier than other Americans mainly because of treatable medical conditions (NAMI, 2013). Mood disorders such as depression are the third most common reason for hospitalization in the USA (NAMI, 2013). In 2012, it was estimated that 9 million adults had serious suicidal thoughts, and 1.3 million attempted suicide (Substance Abuse and Mental Health Services Administration [SAMHSA], 2013). In 2010, suicide was the tenth leading cause of death in the USA, and most of the people who died from suicide (90%) had one or more mental disorders (NAMI, 2013).

A variety of mental health treatment settings are available including inpatient, partial hospitalization, and outpatient services. The choice of treatment setting depends, to a large extent, on the severity of illness (Catty, Goddard, & Burns, 2005; Hill, 2011; Leung, Drozd, & Maier, 2009; Soref & De Vries, 2005). In spite of the variety of these services, it was estimated in 2012 that 25.8 million adults with AMI (60%) did not receive mental health treatment (SAMHSA, 2013). Several reasons were reported for not
receiving treatment including: the cost of treatment (45.7%), the perception that one was able to handle the problem without treatment (28.2%), not knowing where to go for services (22.8%), and not having time (14.3%) (SAMHSA, 2013).

**Partial hospitalization program**

A partial hospitalization program (PHP) is a transitional stage of treatment between inpatient, for patients with acute and severe illness, to outpatient clinics when the disorder is chronic and/or more stabilized (Catty et al., 2005; Hill, 2011; Leung et al., 2009; Soref & De Vries, 2005). Also known as a day hospital or a day treatment program (Catty et al., 2005; Hill, 2011; Joyce, Ennis, O’Kelly, Ogrodniczuk, & Piper, 2009; Ogrodniczuk & Piper, 2001; Soref & De Vries, 2005) the major purposes of the PHP are to improve patient symptoms, daily functioning, and skill building (Lariviere, Desrosiers, Tousignant, & Boyer, 2011). The PHP depends mainly on group therapies such as psychotherapy, art therapy, education groups, and case management (Hill, 2011; Lariviere et al., 2011; Neuhaus, 2006).

Most PHPs have a treatment intensity of four to six hours per day, five days per week (Brown, 2004; Leung, 2009). Patients usually attend PHP voluntarily, spend most of the day in treatment, and go home during the evening (Hill, 2011; Jakovljevic, 2008; Leung et al., 2009). This is one of the major advantages of PHPs, since patients are more connected with their family and their community (Hill, 2011; Jakovljevic, 2008; Leung et al., 2009). As a result, patients experience less disruption in their lives than during inpatient hospitalization (Jakovljevic, 2008). Some PHPs are offered during the evening or during the weekends which increases the likelihood of participation especially for patients who are employed (Azim, 2001; Leung, 2009).
PHP is usually viewed as a “step down” treatment from inpatient services, especially for patients who show improvement in their symptoms and functionality, but are not yet ready to enroll in outpatient services or to go back to their community full time (Jakovljevic, 2008; Leung et al., 2009; Tuttle & Woods, 1997). Also, PHP may be used to decrease the need to “step up” to inpatient services, especially for relapsed patients or for patients who did not respond to outpatient treatment (Jakovljevic, 2008; Leung et al., 2009; Tuttle & Woods, 1997). Criteria for admitting patients to a PHP include: a) having a mental illness that significantly impairs the person’s functionality, b) inability to maintain themselves in the community even with the support they are receiving from outpatient services, c) showing the need for crisis stabilization or transitioning from inpatient services, and d) the admission is based on a psychiatric diagnosis and individualized treatment plan (Brown, 2004; U.S. General Services Administration, 2009). For insurance purposes, the PHP team must certify that if the person is not admitted to the PHP, then the client will require psychiatric inpatient services (Brown, 2004; Leung et al., 2009).

There is a wide variation in PHPs in terms of their theoretical orientation, treatment objectives, treatment intensity (i.e., hours per day and days per week), treatment duration (i.e., length of stay), patients’ age, homogeneity of patients’ diagnoses, and affiliation (setting) (Neuhaus, 2006; Tasman & Riba, 1992). For example, the treatment approach for some PHPs is cognitive behavior therapy (CBT) while other PHPs use dialectical behavioral therapy (DBT) (Jakovljevic, 2008). Also the PHP can include patients with different mental disorders (heterogeneous group), or it could be developed to treat only patients with a certain disorder (homogenous group) (Neuhaus, 2006; Tasman & Riba,
In addition, certain PHPs are for children and adolescents, while others only accept adult patients (Jakovljevic, 2008; Neuhaus, 2006). Finally, some PHPs are located in hospitals and are usually more intensive and have a relatively short duration of treatment (Leung et al., 2009; Tasman & Riba, 1992). Other PHPs are located in community mental health centers and are usually less intensive and have a longer duration of treatment (Leung et al., 2009; Tasman & Riba, 1992).

**History of PHP**

The major reason for developing PHPs was the need to decrease the utilization of costly psychiatric inpatient hospitalizations (Gibson, 2011; Tasman & Riba, 1992). The first known PHP was established in 1933 in a Russian psychiatric hospital when there was a need to find an alternative for inpatient services which were not readily available (Gibson, 2011; Tasman & Riba, 1992). The duration of treatment was approximately two months with the primary modality of treatment being work therapy (Tasman & Riba, 1992). In 1947, the first PHP in North America was developed in Montreal, Canada at the Allen Institute of Psychiatry (Tasman & Riba, 1992). The rationale for developing this PHP was related to the belief that most patients with mental illness did not need 24-hour hospitalization and were stable enough to attend the program during the day (Tasman & Riba, 1992). In the USA, the first PHP was developed in 1949 at The Menninger Clinic in Topeka, Kansas (Tasman & Riba, 1992). This program was offered five days per week and it offered similar services to those provided in an inpatient setting (Tasman & Riba, 1992).

In the USA, the development of PHPs in community mental health centers (CMHCs) intensified after the passage of the Mental Retardation Facilities and Community Mental
Health Center Construction Act 1963 (Gibson, 2011; Tasman & Riba, 1992). Later amendments to the Act required that day treatment (PHP) was one of the services offered for CMHC designation. Thus, the number of PHPs increased rapidly (Leung et al., 2009; Tasman & Riba, 1992). PHPs were ultimately recognized as a strategy for decreasing the demand on expensive inpatient services (Tasman & Riba, 1992). Also, PHPs reduced the rate of relapse presumably because patients were still in contact with their families, communities, daily activities, and sometimes with their jobs (Tasman & Riba, 1992). The total number of PHPs in the USA was 1,600 by 1980 (Tasman & Riba, 1992).

The utilization of PHPs persisted for an additional reason; the continuous decrease in insurance reimbursement and budget cuts for inpatient services encouraged the development of new PHPs (Jakovljevic, 2008; Tasman & Riba, 1992). In 1987, the Omnibus Budget Reconciliation Act allowed Medicare beneficiaries to receive coverage specifically for PHPs that were affiliated with hospitals (Leung et al., 2009). This coverage was extended in 1990 for PHPs in CMHCs (Leung et al., 2009). Consequently, the number of PHPs increased significantly in the 1990s, and the Medicare reimbursement for CMHCs increased 482% between 1993 and 1997 (Leung et al., 2009).

In 1998, the Office of Inspector General (OIG) conducted a study to determine the services provided in PHPs and the amount of billing associated with these services (Leung et al., 2009). The findings indicated that Medicare paid for unallowable and highly questionable PHP services, which took place mainly in CMHC-based PHPs (Leung et al., 2009). After the dissemination of OIG report, insurance companies used stricter scanning procedures for PHP charges, which forced many PHPs, especially CMHC-based PHPs, to close (Leung et al., 2009). The total number of PHPs in the USA
was 689 by 2005 (511 hospital-based PHPs & 178 CMHC-based PHPs) (Leung et al., 2009). After that, there was a continuous decrease in the number of PHPs mainly because of the Hospital Outpatient Prospective Payment System (OPPS) which led to a continuous decrease in PHPs reimbursement (Barlas, 2006; Heath, DaVanzo & Dobson, 2014; Leung et al., 2009). Also, the results of another OIG study (2012) found that 50% CMHC-based PHPs had unusually high billing (Levinson, 2012). The total number of PHPs in the USA was 487 by 2013 (410 hospital-based PHPs & 77 CMHC-based PHPs) (Heath et al., 2014).

**Treatment approaches**

The effectiveness of PHP is largely related to the use of group psychotherapy as the main treatment approach (Hill, 2011; Lariviere et al., 2011; Neuhaus, 2006). Group psychotherapy is one of the most widely practiced treatment methods in mental health treatment, in general, because of its effectiveness in treating patients with depression and personality disorders (Montgomery, 2002; Yalom, 2005). Several researchers found no significant difference in outcome between group and individual psychotherapy and, as a result, it is considered a cost-effective alternative to individual psychotherapy for different types of mental disorders (Bachar, Canetti, Yonah, & Bonne, 2004; Cabedo, et al., 2010; Gutteling, Montagne, Nijs, & van den Bosch, 2012). During group psychotherapy sessions, patients have the opportunity to discuss their symptoms, family issues, and fears of getting work or returning to their employment (Tasman & Riba, 1992; Yalom, 2005). Also, patients are expected to monitor the progress of other patients, give them feedback, and share with them methods of coping and strategies that may improve their functionality (Tasman & Riba, 1992; Yalom, 2005).
Other services provided in PHPs include: case management, individual psychotherapy, family counseling, skill building, medication administration, and medication education (Brown, 2004; Hill, 2011; Leung et al., 2009). Activity therapy (e.g. art therapy, play therapy) and occupational therapy are also considered part of the treatment approaches in PHPs which facilitate behavioral activation, social interaction, and learning new coping skills (Khawaja & Westermeyer, 2010).

**PHP versus inpatient hospitalization**

One of the major advantages of PHP is that it is a cost-effective treatment for patients with mental disorders especially when compared to inpatient hospitalization (Bateman & Fonagy, 2003; Crino & Djokvucic, 2010; Horvitz-Lennon, Normand, Gaccione, & Frank, 2001; Lariviere et al., 2011; Ogrodniczuk & Piper, 2001). For example, Lariviere et al. (2011) compared PHP to inpatient hospitalization for 6 months before and after treatment in terms of the total direct cost of mental health services which included the utilization of inpatient services, emergency services, outpatient clinics, and private health care professionals. The results showed that the level of cost reduction per patient was greater with PHP (118 Canadian dollars per day, 38%) than during hospitalization (23 Canadian dollars per day, 7%) (Lariviere et al., 2011). Both PHPs and inpatient hospitalization contributed to overall cost reduction because there was less need for emergency services (Lariviere et al., 2011). However, PHP resulted in greater cost reduction because of the significant decrease in need for future hospitalization (Lariviere et al., 2011). Horvitz-Lennon et al. (2001) also compared PHP and inpatient hospitalization and found that PHPs are associated with lower service utilization.
With the continuous decrease in insurance reimbursement for mental health services, there is a need to decrease the cost of care especially for inpatient services (Jakovljevic, 2008; Masters, Baldessarini, Öngür, & Centorrino, 2014). It is estimated that inpatient psychiatric services consume 70% of the total mental health expenditures in the USA (Azim, 2001). PHPs are one of the solutions to address this problem because they are considered safe and less expensive alternatives to inpatient services when patients do not need to be confined in the hospital (Jakovljevic, 2008; Masters et al., 2014). This allows patients to stay in PHPs until they are ready to step down to outpatient care and return to their community and normal life (Jakovljevic, 2008; Masters et al., 2014). It is estimated that the average daily Medicare reimbursement for hospital-based PHPs and CMHC-based PHPs is approximately $200 and $105 respectively (National Association of Psychiatric Health Systems [NAPHS], 2014). On the other hand, the average Medicare reimbursement for inpatient services is approximately $713 per day (Centers for Medicaid & Medicare Services [CMS], 2014). According to Azim (2001), 70-90% of patients who had utilized inpatient services, could have been treated using PHPs. So, it is expected that the annual cost of treating people with mental illness could be significantly decreased if more patients are treated in PHPs rather than in inpatient sittings (Barlas, 2006; Lariviere et al., 2011; Masters et al., 2014).

In addition to financial benefits, there is evidence that PHPs play a role in improving the clinical and functional status of patients. For example, Soref & De Vries (2005) conducted a study to evaluate the effectiveness of PHP for older adults with mental illness. They found that 80% of PHP participants had significant improvement in functional level, while 66% showed a significant decrease in depressive symptoms. In
addition, Liebherz et al., (2012) conducted a study to measure the effectiveness of PHPs for adults with mental illness. The results of this study demonstrated significant improvements in psychopathological symptoms and quality of life during PHP treatment, at discharge, and 18 months after discharge (Liebherz et al., 2012). Finally, Lariviere et al., (2011) found that the level of improvement of symptoms, self-esteem, patient satisfaction, and social participation were greater in patients who attended PHP than in those who were hospitalized.

**PHP attendance**

Patients with mental illness often have poor adherence to treatment and thus it is expected that they will also have a low rate of PHP attendance (CDC, 2011; Ogrodniczuk & Piper, 2001). The average rate of attendance is defined as the percentage of days attended by each patient of the total possible (scheduled) days of attendance (Ogrodniczuk et al., 2006; Oviaso & Ball, 1996). The rate of attendance is considered one of the outcome measures of PHPs because it estimates the level of patients’ adherence (Oviaso & Ball, 1996). Dropout rate is also used in research studies as a measure of non-adherence to PHPs (Ogrodniczuk et al., 2006). However, one of the major disadvantages of using dropout rate to estimate patients’ adherence is the inconsistency in the operational definitions of this concept (Diwan & Elizabeth, 2001; Ogrodniczuk et al., 2006; Thompson, 2007). For example, some researchers define dropout in relation to the number of sessions attended, while others depend on the therapist’s judgment of the reason of dropping out regardless the number of sessions attended (Diwan & Elizabeth, 2001). The inconsistency in defining and measuring dropout rate minimizes the ability to
compare between studies and limits the generalizability of the results (Ogrodniczuk et al., 2006).

**Low rate of attendance: Disadvantages**

**Effects on the patient**

Patients who do not attend PHP regularly may be affected negatively because they miss part of their treatment (Yalom, 2005). The likelihood of achieving positive outcomes will be less because PHP treatment approaches, especially group psychotherapy, require regular attendance (Diwan & Elizabeth, 2001; Ogrodniczuk, Piper, & Joyce, 2006). The lack of continuity in treatment may lead to exacerbation of symptoms, relapse, and unplanned discharge (Gillis, Russell, & Busby, 1997). Gillis et al., (1997) found that 35% of patients with unplanned discharge had a low rate of attendance prior to their final day.

**Financial effects**

Because a low rate of attendance may have negative consequences on a patients’ mental health, inpatient services may be required. This would result in overutilization of inpatient services and ultimately increase in the total cost of mental health treatment (Horvitz-Lennon et al., 2001; Lariviere et al., 2011; Masters et al., 2014). In addition, a low rate of attendance negatively affects the amount of PHP reimbursement because some types of insurance, such as Medicare, require that the patient must attend 20 hours each week to receive reimbursement (Leung et al., 2009). Finally, PHP staffing and programming depend on the daily total number of patients who attend (Evans, 1992). For example, if the rate of attendance is very low (e.g. only two patients attend on a given
day), PHP staff cannot run a group psychotherapy session and they cannot bill for it (C. McGowan, personal communication, October 14, 2014).

Effects on other patients

It is universally agreed that the optimum size of a psychotherapy group is six to eight members (Brewer, 1998; Tasman & Riba, 1992; Yalom, 2005). The size of the group affects the success of the group in several ways. When the size of group becomes less than ideal (e.g. only three or four patients), the amount of interaction and emotional expression will decrease significantly (Ogrodniczuk et al., 2006; Yalom, 2005). So, group cohesiveness will be negatively affected and group members may feel that the group is not making progress (Ogrodniczuk et al., 2006; Yalom, 2005). As a result, it is possible that other group members will be less motivated to attend (Ogrodniczuk et al., 2006; Yalom, 2005). It has been found that participants of group therapy sessions comprised of five to nine members reported the strongest cohesion outcome than those in sessions with fewer than five members (Burlingame, McClendon, & Alonso, 2011).

Determinants of health-seeking behavior

Most of the interventions that are used to change health behaviors are based on ideas that originated from either well established theories or arbitrarily and less scientific resources such as personal experiences, intuitions, and opinions (Brewer & Rimer, 2008). The advantages of using theories to understand and change health behavior is related to the well-defined constructs which enables comparison of research studies that focus on the same behavior (Brewer & Rimer, 2008). Also, the use of theories will facilitate the generalizability of findings to other populations, settings, and times (Brewer & Rimer, 2008). In addition, it has been found that theory-based interventions are more effective in changing health behavior than those without theoretical basis (Brewer & Rimer, 2008).
There are many theories and models that were developed to understand health behavior such as Health Belief Model, Theory of Planned Behavior, the Trans-Theoretical Model, and Precaution Adoption Process Model (Brewer & Rimer, 2008).

**Criteria for choosing a theory**

There is little evidence regarding the superiority of a certain theory over others (Brewer & Rimer, 2008). Also, each theory use different set of constructs to predict or change a health behavior (Brewer & Rimer, 2008). Therefore, the most important step to choose a theory is to look for research studies that compare the effectiveness of theories in predicting a given behavior (Brewer & Rimer, 2008). The following step is to look at the strengths and weaknesses of each theory (Brewer & Rimer, 2008). Finally, a careful assessment should be done to assess the fit of a given theory with the targeted behavior and population of interest (Brewer & Rimer, 2008). The section below contains a description and a comparison of the two most commonly used models that guided thousands of research studies which focused on wide variety of health behaviors (Brewer & Rimer, 2008).

**Health belief model (HBM)**

This model assumes that health-seeking behavior is influenced by the person’s perception of threat posed by a health problem and the value of health behavior (Champion & Skinner, 2008). The concepts of the HBM are perceived susceptibility, perceived severity, perceived benefits and costs, and enabling or modifying factors (Champion & Skinner, 2008). Perceived susceptibility is defined as the person’s belief of being at risk to have a health problem (Champion & Skinner, 2008). Perceived severity
means the patient’s perception of the degree of severity of the health problem, while perceived benefits means the patient’s belief that a particular treatment will cure the illness or prevent it (Champion & Skinner, 2008). On the other hand, perceived barriers include the complexity, duration, and accessibility of the treatment (Champion & Skinner, 2008). Finally, the enabling or modifying factors include: personality variables, and socio-demographic factors, and they indirectly affect the actual behavior (Champion & Skinner, 2008).

**Theory of planned behavior (TPB)**

This theory assumes that the intention of engaging in a particular behavior determines, to a large extent, the actual engagement in that behavior (Ajzen, 2005). Intention is determined by three social and cognitive factors: attitude toward the behavior, perceived behavioral control, and subjective norm (Ajzen, 2005). This theory successfully predicted participation in many healthy behaviors such as physical activity, smoking cessation, blood donation, condom use, and breast self-examination (Fishbein & Ajzen, 2010). A significant strong positive correlation between intention and actual behavior has been reported in many studies that examined these behaviors (Fishbein & Ajzen, 2010). Also, several researchers successfully predicted people’s intentions to participate in mental health treatment using the three social and cognitive factors mentioned above (Compton & Esterberg, 2005; Mo & Mak, 2009; Skogstad et al., 2006; Woods, 2013).

**Comparison of TPB versus HBM**

Several researchers compared the TPB and HBM and found that the TPB is better than the HBM in predicting and explaining behaviors. For example, Thornton and Calam
(2010) compared the predictive validity of the TPB and HBM in measuring intentions to attend a universal parent-training program for parents of children with behavioral difficulties. The findings indicated that both models significantly predicted parents’ intention to attend the program but the TPB accounted for more variance (54.5%) than the HBM (32.3%). Also, Buscemi (2003) found that both the TPB and the HBM predicted the intention of patients with mental illness and their families to enact an advance directive applying to psychiatric care. However, the TPB had a stronger predictive power than the HBM (Buscemi, 2003). Finally, Şimşekoğlu & Lajunen (2008) conducted a study in Turkey to compare the predictive validity of the TPB and the HBM in terms of seatbelt use by front seat passengers. They found that the TPB model had a good fit to the data, while the HBM fitted poorly (Şimşekoğlu & Lajunen, 2008).

The major advantages of the TPB are the precision in formulating the causal relationships between the constructs, and the detailed explanation and clear description of measurement procedures (Brewer & Rimer, 2008). These are considered weaknesses of the HBM because it lacks the standardized measurement approaches that should be available for researchers who are interested in using the HBM (Brewer & Rimer, 2008). Another advantage of the TPB (over the HBM) is related to the focus on the effect of several beliefs and attitudes on health behavior, which are modifiable. This makes the TPB a good framework for testing many interventions to change the beliefs and attitudes of a given health behavior (Brewer & Rimer, 2008).
Purpose

The purposes of this study are (a) to investigate the effect of attitude toward attendance, subjective norm, and perceived behavioral control on intention of adults with mental illness to attend PHP, (b) to examine the direct effect of intention and perceived behavioral control on actual PHP attendance, (c) to estimate and examine the fit of the TPB with the collected data, and (d) to investigate the indirect effect of attitude toward attendance, subjective norm, and perceived behavioral control on actual PHP attendance.

Theoretical Framework

The theory of planned behavior (TPB) will be used to examine the phenomenon of PHP attendance and its predictors. This theory was developed by Icek Ajzen in 1985, and it is considered the modified version of the theory of reasoned action (TRA) which was developed by Ajzen and Fishbein (Ajzen, 2005). The TPB has higher predictive power of behaviors than the TRA because it includes the concept of perceived behavioral control which accounted for non-volitional behaviors (Ajzen, 2005). The concepts of the TPB include: attitude toward the behavior, subjective norm, perceived behavioral control, intention, and behavior (Ajzen, 2005; See Appendix A).

Attitude toward a behavior is defined as the degree of a person’s positive or negative appraisal of performing a certain behavior (Ajzen, 2005). It is considered a personal factor in the TPB (Ajzen, 2005). Attitude toward a behavior is determined by a) the “behavioral beliefs” which is defined as the subjective judgment that a particular action will lead to a certain outcome(s), and b) the strength of those behavioral beliefs (Ajzen, 2005). For example, a person may believe that attending the PHP daily (the behavior)
reduces depressive symptoms, improves functioning and so forth (outcomes). *Attitude toward a behavior* can be measured directly by using a group of semantic differential items that reflect the person’s evaluation of performing a behavior (Ajzen, 2005). For example, the person should report whether attending PHP daily is considered good or bad, harmful or beneficial, and interesting or boring.

*Subjective norm* is defined as the degree of social influence on a person to perform or not to perform a behavior (Ajzen, 2005). *Subjective norm* is determined by “normative beliefs” which is defined as the person’s perception of how much family and significant others approve or disapprove of engaging in a particular behavior (Ajzen, 2005). Normative beliefs also include the person’s perception of the likelihood that family members (or significant others) themselves will (or will not) engage in the behavior (Ajzen, 2005). *Subjective norm* is also determined by the person’s motivation to comply with the family and significant others expectations toward engaging in a certain behavior (Ajzen, 2005). Again, *Subjective norm* can be measured directly by using a group of semantic differential items that will estimate the amount of social pressure to engage or not to engage in a particular behavior (Ajzen, 2005). For example, the person should report the level of agreement/disagreement with a statement that says “most people who are important to me think that I should attend the PHP daily”.

*Perceived behavioral control* is defined as a person’s belief in his or her ability to perform a certain behavior (Ajzen, 2005). *Perceived behavioral control* is considered to have both a direct effect on the behavior and an indirect effect by its association with intention (Ajzen, 2005). *Perceived behavioral control* is determined by a) “control beliefs” which is defined as the person’s perception of all the factors that facilitate or
impede a certain behavior, and b) by the power (strength of effect) of each factor (Ajzen, 2005). *Perceived behavioral control* can be measured directly by using a group of semantic differential items that will estimate the person’s ability and control of engaging in a certain behavior (Ajzen, 2005). For example, the person should report the level of agreement/disagreement with a statement that says “whether or not I attend the PHP daily is completely up to me”.

*Intention* is defined as the person's readiness to engage in a particular behavior (Ajzen, 2005). It is positioned in this theory as the immediate antecedent of the behavior (Ajzen, 1991; Ajzen, 2005). According to the TPB, the three concepts *attitude toward a behavior, subjective norm, and perceived behavioral control* are considered predictors of intention (Ajzen, 2005). Finally, *behavior* is defined as the actual response of a person to a certain situation, and it is determined by the person’s intention to perform that behavior and the perceived behavioral control (Ajzen, 1991; Ajzen, 2005).

This theory will be tested to show how much variance of actual attendance is related to the person’s intention to attend and his or her perceived behavioral control. Another aspect of this theory that will be tested is to show whether the three factors (attitude toward behavior, subjective norm, and perceived behavioral control) predict intention to attend PHP. According to the TPB (see the theoretical framework below), we can assume that if a patient evaluates attending PHP in a positive way (attitude toward the behavior), and believes that his/her family and significant others approve of attendance (subjective norm), and the patient has the control and ability to attend (perceived behavioral control), then the person’s intention to attend PHP will be high. Thus, the person’s actual rate of attendance (behavior) will be high. (See Figure 1)
Significance

Several researchers investigated factors that affect decisions to attend PHP such as patient’s motivation for treatment (Crino & Djokvucic, 2010), number of PHP readmissions (Thompson, 2007), severity of illness, ethnicity of the participant, means of transportation (Evans, 1992), duration of PHP (Evans, 1992; Gillis et al., 1997), and the level of group cohesion (Crino & Djokvucic, 2010; Ogrodniczuk et al., 2006). However, there is no research that has utilized the TPB as a theory-based approach to predict intention to attend PHP and the actual PHP attendance.

The results of this study may increase the ability of PHP staff to identify patients with a likelihood of lower rates of attendance. PHP staff can assess patients in terms of their attitudes toward attendance, subjective norm, and perceived control of barriers to attendance. The assessment and measurement of these factors will enable the PHP staff to estimate patients’ intentions to attend and their actual PHP attendance. Then, staff can consider in the treatment plan potential risks for non-attendance and work with patients to decrease the effect of these factors. This may increase the likelihood of improvement in patients’ mental health, reduced need for costly inpatient hospitalizations, and decreased total cost of mental health treatment.

The findings of this study may guide PHP staff to tailor interventions that can improve the rate of attendance. For example, staff may find that a particular patient is at risk of regular non-attendance because family members disapprove of PHP attendance (resulting in a low subjective norm score). Then, staff may arrange a family meeting so that family members can discuss the pros and cons of PHP attendance. On the other hand, PHP staff may find that a certain patient has a low intention to attend because of his/her
negative attitude toward attendance. So, PHP staff should work on changing his/her attitude toward attendance by explaining the expected positive outcomes at the time of PHP completion such as expected significant improvement in symptoms, functionality, coping skills, and social skills. Staff can also provide the patient with research articles that shows the effectiveness of PHPs. Also, PHP staff can inform the patient about the consequences of frequent non-attendance (e.g. terminate their participation in the PHP, being at a higher risk of relapse). Finally, staff may find that a certain patient has low scores of perceived behavioral control. Then, staff can work with that patient to determine the factors that might impede his/her attendance (e.g. transportation), and find solutions to those barriers (e.g. free bus passes, provide a PHP shuttle to pick up the patient from home).

The results of this study will provide a more precise estimation of patients’ adherence to their participation in PHPs because it will measure the average rate of attendance. Since we will measure the rate of attendance (instead of dropout rate), it will improve the generalizability of findings and facilitates comparison with other studies. Finally, this study will test the effectiveness of the TPB in predicting intentions and behaviors. As far as I can determine, this is the first study that will predict attendance by people with mental illness in a PHP using the TPB.
Figure 1. Theoretical framework of the study
Chapter 2

LITERATURE REVIEW
Introduction

One of the most commonly used methods to estimate treatment adherence is to measure treatment attendance (Fung, Tsang, & Corrigan, 2008). Treatment non-attendance is a common problem in all types of treatment, but this problem is more prevalent in patients with mental illness (Adeponle, Obembe, Suleiman, & Adeyemi, 2007; Alnamlah, 2006; Filippidou, Lingwood, & Mirza, 2014). Mental health treatment non-attendance is twice that of medical treatment non-attendance (Adeponle et al., 2007; Alnamlah, 2006; Filippidou et al., 2014; Killaspy, Banerjee, King, & Lloyd, 2000; Mitchell & Selmes, 2007). The rate of mental health treatment non-attendance is relatively high ranging between 15%-60% (Alonzo et al., 2011; Arnow et al., 2007; Barrett, Chua, Crits-Christoph, Gibbons, & Thompson, 2008; Defife, Conklin, Smith, & Poole 2010; Hampton-Robb, Qualls, & Compton, 2003; Hofmann & Suvak, 2006; McFarland & Klein, 2004; Mitchell & Selmes 2007).

The purpose of this study is to examine the predictors of partial hospitalization program (PHP) attendance which can be considered a measure of PHP treatment adherence. The theory of planned behavior (TPB) will be used to guide this study. The literature will be reviewed in two major sections: predictors of mental health treatment attendance, in general, and factors that affect PHP outcomes.

The first section, predictors of mental health treatment attendance, in general, is divided into three parts: demographic factors, clinical factors, and barriers to treatment attendance. The second section, factors that affect PHP outcomes, focuses on the most commonly measured PHP outcomes including: patient functioning, psychological
symptoms, quality of life, completion status, and attendance rate. In this section, predictors of poor outcomes at discharge will be identified and a connection is made between the predictors of mental health treatment non-attendance and predictors of PHP outcomes.

Predictors of mental health treatment attendance, in general

The rate of mental health treatment non-attendance is high (15%-60%) and it is consistent among many research studies regardless the type of treatment (e.g. individual psychotherapy, group psychotherapy, etc) or the homogeneity of patients (i.e., patients with the same mental disorder versus patients with different mental disorders) (Alonzo et al., 2011; Arnow et al., 2007; Barrett et al., 2008; Defife et al., 2010; Hampton-Robb et al., 2003; Hofmann & Suvak, 2006; McFarland & Klein, 2004; Mitchell & Selmes, 2007). Mental health treatment non-attendance is broadly defined in this section to include missing the first (initial) appointment, not-completing treatment after attending several days/sessions, and the ratio of missing sessions to the total scheduled sessions. This broad definition provides a holistic approach to understand the phenomenon of poor adherence to mental health treatment, especially, attending psychotherapy sessions.

The wide range of non-attendance rate (15%-60%) is related to several factors including: the use of different theoretical definitions of non-attendance (drop out vs. missing the first session) and different operational definition (e.g. non-completion could be defined as terminating participation after attending a particular number of sessions, and this number widely varies between researchers). Researchers have identified many factors that have a significant effect on mental health treatment attendance, in general.
These factors are grouped into three major categories: demographic variables, clinical factors, and barriers to treatment.

**Demographic variables**

Patient’s age is a significant predictor of mental health treatment non-attendance. Younger patients have higher rates of non-attendance than older patients (Akutsu, Tsuru, & Chu 2004; Arnow et al., 2007; Booth & Bennett, 2004; Daniels & Jung, 2009; Edlund et al., 2002; Graff, Griffin, & Weiss, 2008; Johansson & Eklund, 2006; McFarland & Klein, 2004; Meyer, 2001; Thormahlen et al., 2003). For example, Arnow et al. (2007) examined the effect of age on completion status in patients with chronic depression (n=681) who attended a 12-week treatment for non-psychotic adults in outpatient clinic. Non-completers (n=162, mean age= 41.1) were significantly younger than completers (n= 519, mean age= 43.8).

Level of education also significantly predicts non-attendance. In most studies, patients with lower levels of education had higher rates of non-attendance (Alonzo et al., 2011, Graff et al., 2008; Wang et al., 2005). For example, Graff et al. (2008) examined the effect of level of education on completion status for patients with bipolar and substance use disorders (n=61) who attended group therapy for 12 weeks. Non-completers (n=12, 19.7%) were less likely to be college educated (16.7%) than completers (57.1%). A possible explanation is the association between level of education and socioeconomic status which affects the accessibility to mental health treatment (Graff et al., 2008). Alnamlah (2006), however, found that lower level of education was associated with lower rates of non-attendance but this relationship was not significant.
Race/ethnicity has a significant association with mental health treatment non-attendance. Patients who are from ethnic minorities (non-white) have higher rates of mental health treatment non-attendance (Alonzo et al., 2011; Arnow et al., 2007; Kruse & Rohland, 2002; McFarland & Klein, 2004; Wang et al., 2005). For example, Arnow et al. (2007) examined the effect of ethnicity on completion status in patients with chronic depression \( (n = 681) \) who attended a 12-week treatment for non-psychotic adults in outpatient clinic. Non-completers \( (n = 162) \) contained significantly higher percentage of patients from ethnic minorities (34\%) than Caucasians (22\%). The rate of non-completion by each ethnic minority group was: Hispanic (41\%), African American (35\%), and Asian American (25\%) (Arnow et al., 2007). This association could be related to multiple factors. For example, ethnic minorities are more likely to have higher rates of poverty and mental illness-related stigma, and these are considered barriers to access mental health treatment (Barret et al., 2008). In addition, there is evidence that income is a significant predictor of mental health treatment non-attendance. Patients with lower income are less likely to attend mental health services (Arnow et al., 2007; Chow, Jaffee, & Snowden, 2003; Edlund et al., 2002; Hampton-Robb, Qualls, & Compton, 2003; Meyer, 2001; Smith, 2005).

Other demographic variables such as gender, employment status, and marital status did not show significant association with mental health treatment attendance unless the focus was specifically on the initial contact (i.e. attending the first session). For example, Wang et al., (2005) examined the factors that prevented patients from initiating contact with mental health professionals. The sample consisted of 9282 adults during the first onset of their mental illness. Males and married patients are at higher risk of failure to
initiate contact with mental health professionals than females and never married or divorced patients (Wang et al., 2005). One of the major strengths of this study is the use of nationally representative probability multistage clustered sampling method, which improves the generalizability of findings. On the other hand, Lester & Harris, (2007) examined the factors that affect attendance of first session of psychotherapy in university-based family therapy clinic. The sample consisted of 204 adults, 58% of them attended the first session, while 42% did not. Patients who did not attend the first session were more likely to be divorced ($\chi^2 = 5.9, p < .05$) and unemployed ($\chi^2 = 4.3, p < .05$) (Lester & Harris, 2007). One of the major limitations of this study is the use of non-probability convenience sampling method, which limits the generalizability of the findings. Otherwise, there was no significant difference in the rate of attendance between females and males (Arnow et al., 2007; Alonzo et al., 2011; Coodin, Staley, Cortens, Desrochers, & McLandress, 2004; Edlund et al., 2002), or between individuals who were employed and unemployed (Alonzo et al., 2011; Coodin et al., 2004; Graff, Griffin, & Weiss, 2008). Finally, there was no significant association between marital status and mental health treatment attendance (Adeponle et al., 2007; Alnamlah, 2006; Alonzo et al., 2011; Arnow et al., 2007; Graff et al., 2008).

**Clinical factors**

There is evidence that the number or variety of mental health services predicts non-attendance. The use of single modality treatment (i.e., psychotherapy alone or medications alone) is significantly associated with higher rates of treatment non-attendance when compared to using a combination of psychotherapy and medication (Arnow et al., 2007; Edlund et al., 2002). For example, Arnow et al. (2007) examined the
effect of type of treatment received on completion status in patients with chronic depression (n = 681) who attended a 12-week treatment for non-psychotic adults in outpatient clinic. Participants were divided into three groups: pharmacotherapy group (i.e. patients only received Nefazodone), psychotherapy group (i.e. patients only received cognitive behavioral therapy), and combination group (i.e. patients received both types of treatment mentioned above). There was no significant difference in the rate of non-completion between the three groups. However, non-completers in the combination group had significantly longer length of stay in the treatment (mean days = 40) than pharmacotherapy group (mean days = 27) and psychotherapy group (mean days = 28).

Arnow et al. (2007) examined the reasons of treatment non-completion, and they found that the most commonly reported reason by patients was adverse effects of treatment (23%). Patients in the pharmacotherapy group had significantly higher rate of adverse effects (14%) than patients in the combination group (7%). A possible explanation is psychotherapy increases patients’ tolerance to the side effects of Nefazodone (Arnow et al., 2007).

The findings regarding the association between type of mental illness and rate of treatment non-attendance are inconsistent. For example, Chiesa, Wright, & Neeld, (2003) found that patients with personality disorders have high rates of treatment non-completion during 8 years follow up. Also Thormählen et al. (2003) examined the predictors of treatment (supportive-expressive psychotherapy) non-completion for patients with personality disorders. The sample consisted of 80 patients and non-completion rate was 50%. These studies included only patients with personality disorders. So, the generalizability of their findings is limited to patients with personality
disorders, and the comparison with studies that focus on other types of mental disorders is not feasible. On the other hand, McFarland & Klein, (2004) examined the effect of type of mental illness (dysthymic disorder vs. major depression) on mental health treatment use during a 7 ½ years follow up. Patients with depression ($n = 36$) had significantly lower length of treatment (mean of total months of treatment = 27.36) than patients with dysthymic disorder ($n = 85$, mean of total months of treatment = 44.26). So, patients with depression are expected to have high rate of treatment non-attendance (Mohr et al., 2006; Mohr et al., 2010; McFarland & Klein, 2004). One possible explanation is that depressed people have high scores of perceived barriers to psychotherapy and psychological treatment as measured by the Perceived Barriers to Psychological Treatment (PBPT) scale (Mohr et al., 2006; Mohr et al., 2010). Seventy-four percent of patients with depression (compared to 51.4% of patients without depression) reported having at least one barrier that would make it difficult to participate in psychotherapy (Mohr et al., 2006). Depression was a significant predictor of all PBPT subscales (except time constraints) including: stigma, low motivation for psychotherapy, emotional concerns, negative evaluation of therapy, misfit of therapy to needs, participation restriction, availability of services, and cost (Mohr et al., 2010).

There is evidence that a significant association exists between the severity of mental illness/symptoms and rates of treatment non-attendance, but there was inconsistency in the direction of relationship. For example, less severe depressive symptoms and low level of interpersonal distress at baseline were associated with higher rates of treatment non-attendance among patients with mental illness (Akutsu et al., 2004; Alonzo et al., 2011; Ogrodniczuk et al., 2006; Thormahlen et al., 2003). Also, Akutsu et al., (2004) examined
the predictors of attending the first (intake) appointment in an Asian-oriented ethnic-specific mental health program. The sample consisted only of Asian Americans (n = 983) with mental illness. The sample consisted mainly of women (64.4%) with depression (69.3%), with a mean age of 40.5 years. Patients with lower number of suicide attempts had higher rates of treatment non-attendance (Akutsu et al., 2004). The association between higher rates of non-attendance and less severe symptoms at baseline could be explained by patients’ feelings of lower urgency for care (Akutsu et al., 2004; Barrett et al., 2008; Bollini, Tibaldi, Testa & Munizza, 2004; Mojtabai et al., 2011; Moon, 2012).

On the other hand, Ong, Kuo, & Manber (2008) examined the predictors of completion status in cognitive behavioral therapy group that lasted for seven sessions. The sample consisted of 528 adults with insomnia. More severe depressive symptoms at baseline were associated with higher treatment non-completion. Also, Wennberg et al., (2004) examined the effect of personality distress and psychological symptoms on psychodynamic group therapy completion status for adults (n = 94) with a main diagnosis of substance use disorder. Personality distress was measured using the Karolinska Psychodynamic Profile (KAPP) (item score ranges from 1-3, with higher score means higher distress), while psychological symptoms was measured using the Symptom Checklist –90 (SCL-90) (Item score ranges from 0-4 where higher score means higher symptoms). Non-completers (n = 41, 43.6%) reported significantly more difficulties with handling frustration (mean score = 2, p < .05), more distorted body image (mean score = 1.4, p < .05) and higher levels of phobic anxiety (mean score= 1, p < .01) than completers. Finally, Alonzo et al., (2011) examined the predictors of attending any type of psychological treatment during one year after the initial contact with the research team.
The sample (n=273) consisted mainly of women (61.2%) with depression (75%) and previous suicide attempts (48.7%), with a mean age of 37 years. Patient with higher frequency of suicide attempts had higher rates of mental health treatment non-attendance (Alonzo et al., 2011). This contrasts with the findings by Akutsu et al., (2004), but this could be related to targeting totally different populations. For example, Akutsu et al., (2004) recruited only Asian American adults, while the majority (89.0%) of Alonzo et al., (2011) study sample was Caucasians. Although the samples were similar in age, gender and diagnosis, ethnicity was a major factor to limit the generalizability and make the comparison difficult.

There is evidence that co-morbidity increases the rate of treatment non-attendance. People with mental illness have a high rate of medical illness (80%) (Rosemas & Popkin, 2014). One of the most commonly reported reasons for mental health treatment non-attendance was having a physical illness during the time of mental health treatment (Defife et al., 2010). In addition, depressed patients who also had a diagnosis of anxiety disorders showed significantly higher rates of non-attendance than patients with only a diagnosis of depression (Arnow et al., 2007). McFarland & Klein, (2004) focused on patients with dysthymic disorder and examined the effect of having a comorbid diagnosis of personality disorder on mental health treatment completion status during a 7 ½ years follow up. Patients with dysthymic disorder (n = 54) who dropped out of treatment had significantly higher percentage of comorbid diagnosis of personality disorder (31%) than treatment completers (10%). Finally, patients with mental illness who also reported substance abuse were found to have higher rates of non-attendance than patients without reported substance abuse (Meyer, 2001; Mitchell & Selmes, 2007).
Barriers

Many researchers have investigated the relationship between barriers to mental health treatment and treatment non-attendance. Barriers can be financial, environmental, or personal in nature. For example, cost of treatment, and more specifically, not having coverage for mental health services is significantly related to higher rates of treatment non-attendance (Edlund et al., 2002; Gorman, Blow, Ames, & Reed, 2011). Also, the distance between the patient’s house and mental health facility is directly associated with treatment non-attendance (Alnamlah, 2006; Booth & Bennett, 2004; Kruse & Rohland, 2002). As would be expected, transportation availability also has a significant association with decreasing the rate of treatment non-attendance (Defife et al., 2010).

Conflicts and problems associated with other responsibilities of a patient may increase the probability of treatment non-attendance (Akutsu et al., 2004; Defife et al., 2010; Gorman et al., 2011). For example, Defife et al., (2010) surveyed 24 psychotherapists and 542 patients in outpatient psychiatric clinic to examine the rate and reasons of non-attendance. The total percentage of non-attended psychotherapy sessions was 15%. This rate was subdivided into missing one session (21%), missing 2-3 sessions (27%), missing four or more sessions (13%). Several reasons of non-attendance which were grouped into four categories including: clinical problems, practical matters, motivational issues, and negative treatment reactions. Practical matters, which represented 26% of missed sessions, included issues such as having marital-family problems, family commitment, family member’s illness, and work conflicts (Defife et al., 2010). This may explain, to some degree, the association between treatment non-attendance and some demographic variables such as marital and employment status.
Waiting time between scheduling the first appointment/intake session and the actual initiation of treatment is one of the significant predictors of mental health treatment non-attendance. Patients who had longer waiting time had higher rates of treatment non-attendance (Booth & Bennett, 2004; Gallucci, Swartz, & Hackerman, 2005; Hawker, 2007; Kruse & Rohland, 2002; Meyer, 2001; Ogunbamise Reardon, Mohoboob, & Lelliott, 2005). One possible explanation is that the additional waiting time gives patients more time to think about their illness and the urgency of treatment, and this may make them confused and hesitant about attendance (Booth & Bennett, 2004). Another possible explanation is additional waiting time could reverse patients’ positive attitudes toward mental health treatment into a negative one, and decrease their expectations of the therapist role (Meyer, 2001). Longer waiting time may cause patients to view a therapist as a person who hurts, abandons, and disappoints (Meyer, 2001).

The relationship between therapists and patients has a significant effect on the rate of treatment non-attendance. For example, weaker therapeutic alliance was associated with higher rates of treatment non-attendance (Arnow et al., 2007; Johansson & Eklund, 2006; Meier, Donmall, McElduff, Barrowclough, & Heller, 2006). Moreover, poorer language and ethnicity match between therapists and patients were associated with higher rates of treatment non-attendance (Akutsu et al., 2004; Sadavoy, Meier, & Ong, 2004). Sadavoy et al., (2004) found that higher gender match between therapists and patients was associated with higher treatment non-attendance. Also, Deffie et al., (2010) found that patient’s negative reactions to the therapist’s decisions may increase the rate of treatment non-attendance. For example, cancelling or rescheduling appointments by the therapist
may result in higher rate of treatment non-attendance than cancelling appointments by patients (Defife et al., 2010).

There is evidence that the relationship among patients who are attending therapy groups affect the rate of attendance. Group cohesion and interpersonal relationships are affected by personal characteristics. Groups that have lower level of cohesion are at higher risk of treatment non-attendance than groups with high levels of cohesion (Ogrodczuk et al., 2006). Additionally, group therapy members with higher hostility, social inhibition, and cold/distant personality traits had higher rates of treatment non-attendance (Johansson & Eklund, 2006; MacNair–Semands, 2002).

Attitude toward mental health treatment affects non-attendance. Patients who considered mental health treatment ineffective or inappropriate were more likely to not attend treatment than patients with positive attitudes toward mental health treatment (Defife et al., 2010; Edlund et al., 2002; Hofmann & Suvak, 2006; Moon, 2012). For example, Hofmann & Suvak (2006) examined the effect of patients’ attitude toward treatment on completion status of a group therapy for patients with social phobia (n=133). The treatment consisted of 12-week cognitive behavioral group therapy, and a patient is considered non-completer if he/she missed three or more sessions (25% of total possible sessions). Thirty-four patients (25.6%) did not complete treatment. Non-completers had significantly more negative attitude toward group therapy than completers. Also, individuals with low motivation for treatment showed significantly higher rates of mental health treatment non-attendance (Defife et al., 2010; Filippidou et al., 2014). One of the strategies that can be used to improve patient’s attitudes toward mental health treatment is providing videotaped instructional material which includes information about mental
health treatment sessions (Reis & Brown, 2006). This strategy is also suggested to be effective in decreasing the rate of mental health treatment non-attendance (Reis & Brown, 2006).

Forgetfulness is one of the most commonly reported reasons of mental health treatment non-attendance (Defife et al., 2010; Filippidou et al., 2014). Therefore, several methods are now used to remind patients to attend their mental health treatment sessions such as telephone/text reminders and letters. These strategies significantly decreased the rate of non-attendance (Booth, & Bennett, 2004; Conduit et al., 2004; Filippidou et al., 2014; Glyngdal, 2002; Jayaram, Rattehalli, & Kader, 2008; Kitcheman 2007; Krishna & Amarjothi, 2012). For example, Filippidou et al., (2014) used text messages to remind patients of their appointments, and they were successful, although it was a small effect, in decreasing the rate of non-attendance from 11.4% to 10.6%.

There is an association between attitude toward mental illness and mental health treatment non-attendance. Patients who considered having a mental illness stigmatizing or embarrassing had higher rates of non-attendance (Becker, Arrindell, Perloe, Fay, & Striegel-Moore, 2010; Defife et al., 2010; Edlund et al., 2002; Gorman et al., 2011; Sadavoy et al., 2004). As previously noted, patients from ethnic minorities have high rates of stigma toward mental illness, and this is one of the reasons that they have high rate of non-attendance. More importantly, the families of those patients also consider mental illness stigmatizing because of their cultural background and beliefs (Alnamlah, 2006; Barrett et al., 2008, Fung et al., 2008). Therefore, these families do not provide patients with social and emotional support, and they do not encourage their family member to attend mental health treatment sessions (Alnamlah, 2006; Barrett et al., 2008,
Fung et al., 2008). Finally, Barrett et al., (2008) found that there is a significant positive association between psychological mindedness and treatment attendance. Psychological mindedness is defined as the ability of the patient to identify psychological problems and their causes (Barrett et al., 2008; Ogrodniczuk et al., 2011).

**Summary**

There is a great deal of research regarding the predictors of mental health treatment non-attendance, in general. Higher rates of treatment non-attendance would be expected by patients who have certain demographic characteristics including: being younger, having lower levels of education, having lower income and being from an ethnic minority. Also, higher rate of treatment non-attendance is likely by patients with certain clinical characteristics including: having a physical illness and substance abuse disorders during the time of mental health treatment. Finally, several barriers were found to increase rates of non-attendance including: not having coverage for mental health services, longer distance between home and mental health facility, transportation unavailability, and family and work conflicts. Other barriers include: low therapeutic alliance, negative attitudes (stigma) toward mental illness, negative attitudes (ineffective or inappropriate) toward mental health treatment, lower psychological mindedness, and low motivation for mental health treatment.
Factors that affect PHP outcomes

Several researchers investigated the factors that affect PHP outcomes at discharge. The most commonly measured PHP outcomes are overall functioning, psychological/psychiatric symptoms, quality of life, PHP completion status, and PHP attendance rate. Each will be addressed in more detail.

Functioning

Overall functioning was measured, in most research studies, using the Global Assessment of Functioning (GAF) scale. There are several predictors of positive change in GAF score from admission to the time of discharge and follow-up. These predictors included: level of education, employment status, number of individual psychotherapy sessions received, duration of treatment, PHP completion status, treatment intensity (days/week), severity of psychiatric symptoms at baseline, psychological mindedness, presence of substance abuse disorders, and coping style (Karterud et al., 2003; Liebherz et al., 2012; Ogrodniczuk et al., 2011; Olmsted et al., 2003; Pray & Watson, 2008; Soref & De Vries 2005; Zeeck et al., 2009).

Demographic variables such as level of education and employment status predict level of functioning at discharge. For example, Soref & De Vries (2005) conducted a study to determine the effectiveness of PHP in treating older adults (n = 119) with mental illness and factors that affected its outcomes. They found that level of education is positively associated with changes in GAF scores between admission and discharge (GAF Reliable Change Index (RCI) = .426, p < 0.01). They also found that level of education significantly predicted GAF scores at discharge (β = .440, R² = .194, p < 0.01).
Liebherz et al., (2012) also conducted a study with similar purposes to detect the effectiveness of PHPs in treating patients with mental illness (n = 74) and to identify the predictors that affect PHP outcomes. However, they used the Short-Form Health Survey (SF-8) to measure level of functioning instead of the GAF. They found that unemployment was associated with lower levels of functioning at the time of PHP discharge. Lower level of education and unemployment were also associated with higher rates of mental health treatment non-attendance, in general (Alonzo et al., 2011, Graff et al., 2008; Lester & Harris, 2007; Wang et al., 2005).

There is evidence that the dose and duration of treatment are associated with changes in functioning levels at discharge. For example, Soref & De Vries (2005) found that patients who received fewer individual psychotherapy sessions had lower GAF scores at the time of PHP discharge. The relationship between duration of treatment and functioning levels at discharge was inconsistent. For example, Pray & Watson (2008) examined the effect of demographic variables, length of stay, pretreatment global functioning (GAF) scores, and number of attended dual diagnoses group sessions on health outcomes such as relapses, blood alcohol levels, urine toxicology, and post-treatment GAF scores in patients with severe chronic mental illness (n= 48) attending PHP for patients with dual diagnoses. They found a significant association between shorter duration of treatment and having lower GAF scores at discharge. However, this was in contrast with Soref & De Vries (2005) findings. The comparison between the two studies is difficult because the two populations were different. For example, Soref & De Vries (2005) recruited older adults (over 65 years old) with mental disorders (90% of the sample had depressive disorders), while Pray & Watson (2008) recruited only patients
with dual diagnosis (mental and substance use disorders) and most (90%) were less than 59 years of age (81% of patients were 40-59 years old). In addition, the sample size (n = 48) was relatively small in the study conducted by Pray & Watson (2008).

Researchers highlighted the positive effect of days of PHP attendance and PHP completion on the level of functioning at discharge. Olmsted et al., (2003) investigated the effect of PHP treatment intensity (4 days/week versus 5 days/week) on the level of psychological functioning at discharge of 756 patients with eating disorders. The Rosenberg Self Esteem Scale (RSES) and the Beck Depression Inventory (BDI) were used to measure functioning. They found that patient functioning at discharge from a PHP was significantly lower with lower treatment intensity (4 days/week). Also, Karterud et al., (2003) examined the factors that affect PHP outcomes for patients with personality disorders (n = 1010). They found that level of functioning at discharge is affected by PHP completion status. PHP non-completers had significantly lower GAF scores at discharge than PHP completers (Karterud et al., 2003).

Researchers reported conflicting results about the relationship between severity of psychiatric symptoms at baseline and levels of functioning at discharge. For example, Ogrodniczuk et al., (2011) examined the predictors of response to PHP for patients with personality disorders (n=197). Many predictors were investigated and were grouped into six major categories including: personality characteristic (e.g. psychological mindedness), demographics, initial disturbance (global functioning score, quality of life inventory), type of axis I mental disorder, type of personality disorder, and severity of personality disorder. They found that lower changes in functioning scores between the time of admission and the time of discharge is higher in patients with less severe
symptoms at the time of admission. This can be explained by the potential that patients with lower severity of psychiatric symptoms feel less need for treatment, and thus have lower rate of attendance (Akutsu et al., 2004; Alonzo et al., 2011; Bollini et al., 2004; Mojtabai, 2011; Moon, 2012; Ogrodniczuk et al., 2006; Thormahlen et al., 2003). On the other hand, Zeeck et al., (2009) found the opposite, that patients with more severe symptoms at time of admission had less change in functioning scores by the time of discharge than patients with less severe symptoms. The discrepancy in findings could be related to the focus on different populations. For example, Ogrodniczuk et al., (2011) recruited only patients with personality disorders, while Zeeck et al., (2009) recruited patients with different types of mental disorders (depression [39.9%], eating disorders [11.8%], and anxiety disorders [11.3%]).

There is evidence that personal characteristics of PHP patients influence changes in functioning levels at discharge. For example, there is a significant positive relationship between psychological mindedness and higher patient functioning at discharge (Ogrodniczuk et al., 2011). In addition, motivation toward participation in PHP is one of the predictors of functioning levels. Zeeck et al. (2009) conducted a study to determine the factors that affect PHP outcomes for patients with mental illness (n = 567). They found that lower motivation for psychotherapy was associated with lower GAF scores at the time of PHP discharge. Also, Mörtl & Wietersheim, (2008) conducted a grounded theory study with people who are attending PHP (n = 26) to detect facilitators of change and improvement. They found that motivation to participate in PHP treatment is one of the factors that facilitated improvement in functioning and symptoms (Mörtl & Wietersheim, 2008). Low motivation for treatment and low psychological mindedness
also had a significant association with mental health treatment non-attendance, in general (Barrett et al., 2008; Defife et al., 2010; Filippidou et al., 2014).

Finally, researchers found that lower changes in functioning scores between the time of admission and the time of discharge is higher in patients with a diagnosis of substance use disorders (Ogrodniczuk et al., 2011; Pray & Watson, 2008). Active substance abuse is also associated with mental health treatment non-attendance, in general (Meyer, 2001; Mitchell & Selmes, 2007).

**Psychiatric symptoms at discharge**

Psychiatric symptom improvement at discharge can be predicted by several factors such as: PHP completion status, treatment intensity, patient’s age, employment status, number of mental illnesses, motivation for psychotherapy, severity of psychiatric symptoms at base line, substance use disorders, psychological mindedness, subjective initial response, and coping style (Karterud et al., 2003; Liebherz et al., 2012; Ogrodniczuk et al., 2011; Olmsted et al., 2003; Priebe et al., 2011; Zeeck et al., 2009).

There is evidence that patients who attend PHP more frequently and complete PHP treatment have more improvement in their symptoms at discharge than non-completers or patients with low rate of attendance. Olmsted et al., (2003) investigated the effect of treatment intensity (4 days/week versus 5 days/week) on improvement in psychiatric symptoms at discharge. They found that symptom improvement at discharge from a PHP was significantly lower with lower treatment intensity. Also, PHP non-completers showed significantly less improvement in their psychiatric symptoms when compared to completers (Karterud et al., 2003).
Some demographic variables predict psychiatric symptom improvement at PHP discharge and follow up. For example, PHP patients who were unemployed (Priebe et al., 2011) showed less improvement in their psychiatric symptoms at discharge. There was no significant association between patient’s age and psychiatric symptom improvement at discharge (Ogrodniczuk et al., 2011; Priebe et al., 2011). However, older patients who attended PHP had less improvement in their symptoms, three months after discharge, than younger patients (Priebe et al., 2011). Other demographic variables such as gender, education level, and living status (living alone vs. not alone) did not predict psychiatric symptom improvement at discharge and follow-up (Priebe et al., 2011).

The relationship between severity of psychiatric symptoms during admission to PHP and psychiatric symptom improvement at discharge was inconsistent among research studies. For example, Ogrodniczuk et al., (2011) found that lower severity of symptoms at baseline were associated with less improvement of these symptoms at discharge, while Priebe et al., (2011) found that higher severity of symptoms at baseline was associated with less improvement of these symptoms at discharge and three months after discharge. Priebe et al., (2011) included a sample of 765 patients, while Ogrodniczuk et al., (2011) had a much smaller sample, $n = 125$.

There is evidence that co-morbidity of mental disorders is associated with lower psychiatric symptom improvement at PHP discharge. Patients who had higher number of mental disorders at admission showed lower symptom improvement at discharge (Liebherz et al., 2012). In addition, having a diagnosis of substance use disorder is associated with less improvement of psychiatric symptoms at discharge (Ogrodniczuk et al., 2011).
Several personal characteristics are associated with psychiatric symptom improvement at discharge. For example, patients who had lower psychological mindedness and were less motivated for psychotherapy showed less improvement of psychiatric symptoms at discharge (Ogrodniczuk et al., 2011; Zeeck et al., 2009). Finally, there is a significant association between Subjective Initial Response (SIR) and psychiatric symptom improvement at discharge (Pribe et al., 2011). SIR is defined as the “patients’ initial assessment of the appropriateness and effects of their treatment” (Pribe et al., 2011, p. 408). Pribe et al. (2011) found that lower SIR is associated with less improvement in psychiatric symptoms at discharge (Pribe et al., 2011). SIR is similar, when looking at its definition, to the concept of attitude toward mental treatment. As previously noted, patients with negative attitudes toward mental health treatment also have higher rates of non-attendance (Defife et al., 2010; Edlund et al., 2002; Hofmann & Suvak, 2006; Moon, 2012).

Quality of life at discharge

Several predictors have a significant effect on the quality of life of patients who are discharged from PHP. These predictors include: PHP completion status, number of mental disorders, number of substance use disorders, duration of treatment, psychological mindedness, and severity of psychiatric symptoms at base line (Karterud et al., 2003; Liebherz et al., 2012; Ogrodniczuk et al., 2011).

PHP non-completers reported significantly lower levels of quality of life at discharge than PHP completers (Karterud et al., 2003). Also, longer duration of PHP treatment was associated with lower quality of life at discharge when compared to admission (Liebherz et al., 2012). Moreover, having a diagnosis of substance use disorders and higher number
of mental disorders is associated with lower quality of life at discharge (Liebherz et al., 2012; Ogrodniczuk et al., 2011). Finally, Ogrodniczuk et al., (2011) found that lower psychological mindedness and less severe psychiatric symptoms at baseline were associated with lower quality of life at discharge.

**PHP completion status**

PHP completion status and its predictors have been examined. The rate of PHP non-completion ranged from 24% to 55.4% (Diwan and Elizabith, 2001; Karterud et al., 2003; Ogrodniczuk et al., 2008; Tasca et al., 2004). This is similar to the rate of mental health treatment non-attendance, in general (Alonzo et al., 2011; Arnow et al., 2007; Barrett, Chua, Crits-Christoph, Gibbons, & Thompson, 2008; Defife, Conklin, Smith, & Poole 2010; Hampton-Robb, Qualls, & Compton, 2003; Hofmann & Suvak, 2006; McFarland & Klein, 2004; Mitchell & Selmes 2007). Predictors of PHP completion status include: age, level of education, employment, age of onset of mental illness, previous psychiatric inpatient hospitalizations, severity of symptoms, number of contacts with health and social services, attachment style, timing of dropping out, duration of treatment, and substance abuse (Diwan and Elizabith, 2001; Gillis et al., 1997; Miyaji et al., 2008; Ogrodniczuk et al., 2008; Tasca et al., 2004).

Diwan and Elizabith (2001) investigated the factors associated with dropping out of PHP among 117 patients with serious mental illness 52% of whom dropped out. The highest number of drop outs took place in the first two weeks of five month-long PHP. This can be related to several factors which may include negative subjective initial response and negative attitude toward PHP treatment (Defife et al., 2010; Edlund et al., 2002; Hofmann & Suvak, 2006; Moon, 2012; Pribe et al., 2011).
There is evidence that demographic variables such as level of education and employment status have a significant effect on PHP completion status. For example, Miyaji et al., (2008) examined the effect of such characteristics in people with schizophrenia (age, sex, age of onset of schizophrenia, number and duration of previous psychiatric hospitalizations, number of persons who lived with the patient, educational background, previous employment type, & marital status) on completion of PHP (n = 430). Younger age at onset of mental illness was associated with higher rates of non-completion. Researchers also found that lower level of education is significantly associated with higher rates of PHP non-completion (Gillis et al., 1997; Miyaji et al., 2008). This is consistent with findings that lower level of education is associated with mental health treatment non-attendance, in general (Alonzo et al., 2011, Graff et al., 2008; Wang et al., 2005). Moreover, Miyaji et al., (2008) found that unemployment before participating in PHP is associated with higher rates of PHP non-completion. On the other hand, completion status was not associated with certain demographic variables such as gender and marital status (Gillis et al., 1997; Miyaji et al., 2008).

The relationship between patient age and PHP completion was inconsistent among research studies. For example, Ogrodniczuk et al., (2008) explored the predictors of PHP non-completion by patients with personality disorders (n =197). Many predictors (45) were examined and were grouped into six major categories including: personality characteristic, demographics, initial disturbance, type of axis I mental disorder, type of personality disorder, and severity of personality disorder. The findings indicated that 72 (37%) patients terminated their participation early in this program. After adjusting for confounding variables (using multivariate regression modeling), patient age significantly
predicted completion status. Younger patients were at higher risk of PHP non-completion (Ogrodniczuk et al., 2008). However, when researchers did not adjust for confounding variables, they did not find significant difference in age between completers and non-completers (Gillis et al., 1997; Miyaji et al., 2008; Ogrodniczuk et al., 2008). In general, younger patients have higher rates of mental health treatment non-attendance than older patients (Adeponle et al., 2007; Akutsu et al., 2004; Arnow et al., 2007; Booth & Bennett, 2004; Daniels and Jung, 2009; Graff et al., 2008; Johansson & Eklund, 2006; McFarland & Klein, 2004). A possible explanation for this relationship is younger patients are less motivated for PHP treatment and they have a more negative attitude toward mental health treatment (Ogrodniczuk et al., 2008).

Clinical factors such as severity and co-morbidity of mental illness have a significant effect on PHP completion. For example, previous inpatient psychiatric hospitalization predicts PHP non-completion (Gillis et al., 1997; Miyaji et al., 2008; Ogrodniczuk et al., 2008). This is consistent with the findings that inpatient psychiatric hospitalization negatively affects mental health treatment attendance, in general (Defife et al., 2010). In addition, higher severity of symptoms during admission is associated with higher rates of PHP non-completion (Ogrodniczuk et al., 2008). Finally, longer duration of PHP treatment and active substance abuse were associated with higher rates of non-completion (Gillis et al., 1997).

Finally, findings regarding the relationship between patient attachment style and PHP completion status were inconsistent. For example, Tasca et al. (2004) examined the effect of attachment style on PHP completion by patients with anorexia nervosa (n = 74). They measured attachment using the Attachment Styles Questionnaire (ASQ). Completion
status was defined as attending at least 12 weeks of PHP and reaching a body mass index (BMI) of 20. Forty-one of the patients (55.4%) did not complete treatment. Also, there was significant difference between completers (mean = 4.56, SD = .53) and non-completers (mean = 4.17, SD = .45) in ASQ-preoccupied scores. After creating a logistic regression model, researchers found that ASQ-preoccupied scores successfully predicted completion status (OR = 7.74, p = .005). Specifically, patients with high preoccupied attachment style (i.e. being anxious to maintain and focus on relationships) are more likely to complete PHP treatment, while patients with high avoidant attachment style (i.e. having discomfort with close relationships) are more likely to terminate their participation in PHP. On the other hand, Ogrodniczuk et al., (2008) did not find significant association between the attachment style and completion status. It is important to note that Tasca et al., (2004) recruited only females with a diagnosis of eating disorders (n = 74), while Ogrodniczuk et al., (2008) recruited only patients with personality disorders and the sample included both males (n = 61) and females (n = 136).

**PHP attendance rate**

The rate of attendance is defined as the percentage of days attended by each patient of the total possible (scheduled) days of attendance (Ogrodniczuk et al., 2006; Oviaso & Ball, 1996). Both attendance rate and PHP non-completion rate are used as a measure of non-adherence to PHPs (Ogrodniczuk et al., 2006). However, one of the major disadvantages of using non-completion rate to estimate patients’ adherence is the inconsistency in the operational definitions of this concept (Barrett et al., 2008; Diwan & Elizabeth, 2001; Ogrodniczuk et al., 2006; Thompson, 2007). Some researchers define non-completion in relation to the number of sessions attended, but the problem is that
each researcher use different number of attended session to determine completion status (Barrett et al., 2008; Diwan & Elizabeth, 2001; Ogrodniczuk et al., 2006). For example, non-completion could be defined as attending less than four sessions (Ong et al., 2008), or less than six sessions (Wennberg et al., 2004), or less than 12 weeks (Tasca et al., 2004). On the other hand, other researchers depend on the therapist’s judgment of the reason for dropping out regardless the number of sessions attended to determine completion status (Diwan & Elizabeth, 2001). For example, non-completers are those who dropped out against medical advice (Diwan & Elizabeth, 2001). The inconsistency in defining and measuring completion status minimizes the ability to compare between studies and limits the generalizability of the results (Ogrodniczuk et al., 2006).

Several researchers investigated the rate of PHP attendance which varied among patients from 46%-100% (Crino & Djokvucic, 2010; Evans, 1992; Thompson, 2007; Wright et al., 1995). Several factors were found to have a significant effect on the rate of PHP attendance. These factors include: treatment duration, level of group cohesion, motivation for treatment, number of readmissions to PHP, hospitalization to inpatient psychiatry, self-stigma, levels of current insight, living arrangement, medical status, perceived costs / barriers, perceived severity of illness, race, means of transportation (Crino & Djokvucic, 2010; Evans, 1992; Fung et al., 2008; Gillis et al., 1997; Thompson, 2007; Wright et al., 1995). Very few researchers studied the predictors of PHP attendance rate, and each researcher used different set of predictors. So, the integration of evidence and the comparison of findings were difficult.

There is evidence that lower PHP attendance rate is significantly predicted by lower group cohesion and lower motivation to participate in treatment. For example, Crino &
Djokvucic, (2010) investigated the effect of group cohesion and motivation to participate in treatment on the rate of PHP attendance in 36 women with eating disorders. They found a significant positive association between compatibility, a dimension of group cohesion, and attendance ($r = .44$, $p = .03$). Also, they found a significant positive association between motivation to participate in treatment and attendance ($r = .38$, $p < .03$). This is consistent with related research that indicates that lower group cohesion and motivation for treatment also negatively affects the rate of mental health treatment attendance, in general (Defife et al., 2010; Filippidou et al., 2014; Ogrodniczuk et al., 2006). In addition, group cohesion and motivation to participate in PHP were reported by patients as helpful factors that would facilitate change and improve problems while attending PHPs (Mörtl & Wietersheim, 2008). It is noteworthy that the generalizability of findings in the study that was conducted by Crino & Djokvucic (2010) is limited only to women and to those with eating disorders.

There is evidence that the number of readmissions to PHP affect the rate of attendance. Thompson (2007) compared the number of PHP days attended between patients with single admission and patients with multiple admissions. Data collection included review of medical charts of patients attending a PHP during 2001-2003. Thompson (2007) found that the mean number of admission was 1.8 (SD = 1.3). Seventy-three patients (63%) had a single admission, while forty-three (37%) patients had 2-7 PHP admissions. The mean number of attended days for the whole sample was 15.3 (SD = 9.4). Twenty-three patients (20%) attended a total of 5 days in the program, while only seven patients (6%) attended 31-39 days. PHP patients with multiple admissions had a higher rate of attendance (9.2 more days) than PHP patients with single admission ($t =$
This is related to higher co-morbidity of mental illness in patients with multiple admissions. Approximately, half of patients with multiple admissions to PHP had personality disorders beside axis I diagnoses, while only twenty-three percent of patients with single admission to PHP had personality disorder (Thompson, 2007).

PHP rate of attendance is also affected by the race/ethnicity of the patient and the means of transportation to PHP. Evans, (1992) found that African American patients and those who used public transportation to reach PHPs had lower rates of attendance than other patients. Again, these factors are also associated with lower rates of mental health treatment attendance, in general (Alonzo et al., 2011; Arnow et al., 2007; Kruse & Rohland, 2002; McFarland & Klein, 2004; Wang et al., 2005).

Lower rates of PHP attendance is expected in patients with higher self-stigma associated with mental illness, and in patients who live with other people in the same house. Fung et al. (2008) conducted a study in Hong Kong with the purpose of detecting the predictors of PHP attendance in 86 adult patients with schizophrenia. They hypothesized that self-stigma, self-esteem, self-efficacy, insight, and certain socio-demographic variables are considered predictors of attendance. The researchers found that higher levels of self-stigma, more specifically, the “self-concurrence” dimension is considered a significant predictor of lower rate of attendance for patients with schizophrenia ($\beta = -.424$, $p < .001$). Self-concurrence occurs when “an individual applies the culturally internalized beliefs to him or herself (e.g. I am weak because I have a mental illness)” (Watson, Corrigan, Larson, & Sells, 2007, p. 1313). Also, they found that living with others ($\beta = -.199$, $p = .003$) significantly predicted lower rate of attendance. It is important to take cultural differences into consideration when
interpreting the findings of this study which was conducted in Hong Kong, because levels of stigma associated with mental illness in countries like Hong Kong and China are higher than western countries (Fung et al., 2008). For example, stigma related to mental illness explained why living with others, who are likely to view mental illness as humiliating, is associated with lower rates of attendance. Co-habitants may not provide patients with social and emotional support and do not encourage patients to attend mental health treatment (Alnamlah, 2006; Barrett et al., 2008, Fung et al., 2008). This is consistent with the concept of “subjective norm” which is one of the concepts of the theory of planned behavior (Ajzen, 2005). When a patient believes that family members consider mental illness as shameful and are not supportive of mental health treatment, the patient’s intention to attend mental health treatment will be decreased. Ultimately, it is predicted, according to the TPB, that this patient will have a low rate of PHP attendance (Ajzen, 2005).

There is evidence that limited current insight is associated with lower rate of attendance. Current insight was defined as the patient’s awareness of the negative social consequences of mental disorders (Fung et al., 2008). Current insight is similar, in its definition, to the concept of psychological mindedness, which has a significant positive correlation with mental health treatment attendance, in general.

Finally, there is evidence that perceived barriers negatively affect the rate of PHP attendance. Evans (1992) examined predictors of PHP attendance using the constructs of the health belief model (perceived susceptibility, perceived seriousness, perceived severity, perceived cost/barriers), in addition to duration of treatment, and means of transportation. Attendance rate and duration of treatment are two different but related
concepts. Duration of treatment means the total number of days the patient is required (scheduled) to attend, while attendance rate is defined as the percentage of days attended of the total possible (scheduled) days of attendance (Evans, 1992; Ogrodniczuk et al., 2006; Oviaso & Ball, 1996). The sample consisted of 62 patients with different types of mental disorders. The average length of stay was 29.9 days with a range of 8-62 days. Approximately, 60% of the sample had an 80% attendance rate, while 83% of the sample had a 70% attendance rate. Treatment duration ($r = -.44$, $p = .0001$), perceived costs of/barriers to attending PHP ($r = -.38$, $p = .001$), and perceived severity of illness ($r = -.32$, $p = .007$) were negatively correlated with the rate of attendance. The perceived costs of/barriers to attending PHP and perceived severity of illness were significant predictors of attendance and accounted for 28% of variance in the rate of attendance. Several researchers indicated that barriers such as: not having coverage for mental health services (Edlund et al., 2002; Gorman et al., 2011) and the distance between patient’s house and place of treatment (Alnamlah, 2006; Booth & Bennett, 2004; Kruse & Rohland, 2002) were associated with lower rates of mental health treatment attendance, in general. This is also related to the concept of “perceived behavioral control” which is one of the TPB concepts (Ajzen, 2005). When a patient believes that there are several barriers affecting his/her decision to attend mental treatment, a patient’s intention to attend mental health treatment will be decreased. Ultimately, it is predicted that the actual PHP attendance rate will be decreased (Ajzen, 2005).

**Summary of factors that affect PHP outcomes**

There are five commonly measured outcomes in PHPs: level of functioning, psychiatric symptoms, quality of life, PHP completion status, and PHP attendance rate.
Poor PHP outcomes at discharge are predicted in patients with certain demographic characteristics: low level of education and being unemployed. In addition, poor PHP outcomes are expected in patients who received lower treatment intensity and did not complete PHP. Also, poor PHP outcomes at discharge are expected in patients with particular personal characteristics, including low motivation to participate in PHP, not psychologically-minded, and a negative subjective initial response to PHP treatment. Finally, poor PHP outcomes at discharge are predicted in patients with particular clinical characteristics, including receiving fewer individual psychotherapy sessions, having a diagnosis of substance use disorders, and a higher number of comorbid mental disorders.

There are several demographic predictors of PHP non-attendance which include: age, level of education, employment, and race. The clinical predictors of PHP non-attendance include: previous psychiatric inpatient hospitalizations, severity of symptoms, fewer contacts with health and social services, duration of treatment, and having substance abuse disorders. Finally, barriers that predict PHP non-attendance include: low level of group cohesion, low motivation for PHP treatment, self-stigma toward mental illness, low levels of current insight, living with other people in the same house, having a physical illness, higher perceived costs / barriers, higher perceived severity of illness, and need to use public transportation to reach PHP. The predictors of PHP non-attendance were the same predictors of mental health treatment non-attendance, in general.

**Gaps in knowledge**

Very few researchers focused on the rate of PHP attendance as an outcome measure of PHP effectiveness. Also, very few researchers reported the actual rate of PHP attendance. Several researchers investigated the predictors of PHP attendance but these
predictors were not theory-driven. Rather, they were a mix of clinical, demographic, social, and psychological factors. The advantages of using theories to understand and change health behavior is related to the well-defined constructs which enables comparison of research studies that focus on the same behavior (Brewer & Rimer, 2008). Also, the use of theories will facilitate the generalizability of findings to other populations, settings, and times (Brewer & Rimer, 2008).

None of the researchers used the theory of planned behavior (TPB) and its concepts (attitude toward attendance, subjective norm, perceived behavioral control, and intention to attend) to predict the actual rate of PHP attendance. This theory successfully predicted participation in many healthy behaviors such as physical activity, smoking cessation, blood donation, condom use, and breast self-examination (Fishbein & Ajzen, 2010). Also, several researchers successfully predicted people’s intentions to participate in mental health treatment using the three social and cognitive factors mentioned above (Compton & Esterberg, 2005; Mo & Mak, 2009; Skogstad et al., 2006; Woods, 2013). The importance of using the TPB to predict intentions to attend PHP and the actual attendance rate is related to the high predictive power when compared to other behavior-related theories/models such as the health belief model (Buscemi, 2003; Şimşekoğlu & Lajunen 2008; Thornton & Calam, 2010).
Chapter 3

METHODOLOGY
Design and Setting

This study was conducted using a correlational design. The sample was recruited from two partial hospitalization programs (PHP) that are part of a 500-bed urban hospital in the Midwest of the U.S. One PHP is located in the hospital and the other is at a satellite clinic. These PHPs provide services to patients with mental illness with goals of reducing symptoms and facilitating the development of problem-solving skills. The program is offered five days per week (Monday through Friday), six hours per day (9 AM- 3 PM). The treatment approaches that are used in this program include: group psychotherapy, case management, family involvement, and expressive (art) therapy. The interdisciplinary team includes psychiatrists, psychologists, advanced practice nurses, social workers, licensed counselors, expressive therapists, and certified addiction counselors. The duration of treatment is determined at the intake session and varies among patients depending on the severity of symptoms and levels of functioning. These PHPs continuously accept new patients, and on average, they have a total of 50 new patients every month (intensive outpatients and PHP patients). Consequently, the estimated time needed to recruit the required sample size (discussed below) was planned to be four to six months.

Sample size

Calculation of the needed sample size requires consideration of the statistical analysis that will be used in this study. Path analysis was used to determine the direct effect of intentions and perceived behavioral control on attendance rate (Kline, 2011). It was also used to determine the indirect effect of attitudes toward attendance, subjective norm, and
perceived behavioral control on attendance rate. The sample size in path analysis is calculated by consideration of the ratio of cases to parameters with a minimum acceptable ratio of 5:1 (Kline, 2011). The total number of parameters (13) in the theoretical model of this study is calculated by summing the number of factors (5), the number of direct path coefficients (5), and co-variances (3) (Kline, 2011). So, the minimum acceptable sample size that should be used in this study is 65. There is no need to adjust sample size for attrition since this is a cross-sectional study (one-time point of data collection).

**Sampling procedure**

Convenience (non-probability) sampling method was used to recruit the subjects. Henry (1990) explained that in some cases, non-probability sampling methods are the most appropriate especially when there are limited resources and when the focus of the study is on a certain aspect of the population that requires careful selection of the sample. In this study, the target population was patients with mental illness who attend PHPs; but the focus was on investigating the effect of attitude toward PHP attendance, subjective norm, perceived behavioral control, and intention on the actual attendance rate. With convenience sampling, there is a greater likelihood of non-coverage bias than with probability sampling because non-probability sampling methods decrease the representation of the population and thus threaten external validity (Barriball & While, 1999). Selection bias is another issue with convenience sampling but it was reduced by recruiting consecutively all individuals who met the inclusion/exclusion criteria of the study (Hulley et al, 2007).
Inclusion/Exclusion criteria

Patients were eligible to participate in this study if they were adults (18 years and older), in the first two days of the PHP, scheduled to attend 4 or 5 days per week, and English speaking. Patients were excluded from this study if they had severe chronic physical health problems, and if they needed physical assistance from another person to be able to attend the PHP.

Measurement Strategy

A questionnaire of the theory of planned behavior, developed by Thornton and Calam, (2010) was adapted and used in this study. The questionnaire measured the same variables of interest to this study although Thornton and Calam, (2010) were interested in a different population, parents of children with behavioral difficulties. The questionnaire consists of 13 items that represent the four concepts of the theory of planned behavior including: attitude toward behavior, perceived behavioral control, subjective norm, and intention (Thornton & Calam, 2010). The questionnaire has an acceptable level of internal consistency “The TPB subscales ‘intention’, ‘subjective norm’, and ‘attitude’ all had alpha coefficients that exceeded the criterion of 0.7” (Thornton & Calam, 2010, p. 372). However, the perceived behavioral control subscale did not reach the recommended alpha score (0.7) although it was very close to that value (.69) (Thornton & Calam, 2010). The questionnaire subscales also showed stability over time (acceptable test-retest reliability) as evidenced by significant (.001) one-way random effects intra-class correlations (Thornton & Calam, 2010).
Regarding content validity, 29 international experts who used the TPB in their research studies and publications were consulted to determine the appropriateness and validity of items (Thornton & Calam, 2010). All of the items in the questionnaire achieved a percent agreement by the experts that exceeded 80% which is also acceptable (Waltz et al, 2010). Construct validity of the questionnaire was tested using factor analysis (principal component analysis and oblique rotation). The results of the factor analysis revealed that the four factors that resulted after the rotation stage represented the four latent variables of the theory of planned behavior: attitude toward behavior, perceived behavioral control, subjective norm, and intention (Thornton & Calam, 2010).

In the present study, one item was added to the intention subscale and one item to the perceived behavioral control subscale (the rationale for adding the two items is described in the theoretical and operational definition section below). These two items were adapted and added to the original questionnaire with the help of the sample questionnaire and guidelines that are provided by Ajzen (2006) on his website (people.umass.edu/aizen/faq.html), and with the help of a manual dedicated to constructing questionnaires related to the TPB (Francis et al., 2004). As a result of the additions, the questionnaire that was used in this study consisted of 15 items (6 items to measure attitudes toward a behavior, 3 items to measure subjective norm, 3 items to measure perceived behavioral control, and 3 items to measure intention). To better describe the sample characteristics, the first two pages of the questionnaire included demographic and clinical questions. (See appendix B.)

In addition to the questionnaire, a checklist was completed by the primary investigator to record daily the attendance status of each participant. This checklist
included the same ID number that is present on the questionnaire (See appendix C.). To make sure that I was recording the attendance rate for the right subject, the name of the subject was printed at the top right corner of the checklist, and after data collection was completed, the name was removed to maintain confidentiality.

**Theoretical and Operational Definitions**

*Attitude toward attendance* is defined as the degree of a person’s positive or negative appraisal of performing a certain behavior (Ajzen, 2005). Attitude toward a behavior was measured using a subscale composed of six semantic differential items. Participants were instructed to select one of seven ratings indicating the range of agreement with one of two bipolar adjectives. The total range of scores on attitude toward attendance is 6 to 42, with higher scores indicating higher positive attitudes toward attending a PHP. Attitude toward attendance was treated as a continuous variable. Regarding internal consistency “The TPB subscales ‘intention’, ‘subjective norm’, and ‘attitude’ all had alpha coefficients that exceeded the criterion of 0.7” (Thornton & Calam, 2010, p. 372). In this study, this subscale showed good internal consistency (Cronbach’s alpha = .88).

*Subjective norm* is defined as the degree of social influence on a person to perform or not to perform a behavior (Ajzen, 2005). Subjective norm was measured using a subscale composed of three items (7-point response). The total range of scores is 3 to 21, with higher scores meaning higher perceived social influence toward attending the PHP. Subjective norm was treated as a continuous variable. Regarding internal consistency “The TPB subscales ‘intention’, ‘subjective norm’, and ‘attitude’ all had alpha
coefficients that exceeded the criterion of 0.7” (Thornton & Calam, 2010, p. 372). In our study, this subscale showed acceptable internal consistency (Cronbach’s alpha = .71).

Perceived Behavioral Control (PBC) is defined as the amount of perceived ability and controllability to perform a certain behavior (Ajzen, 2005). Perceived behavioral control was measured using a subscale that is composed of three items (7-point response). The range of scores is 3 to 21, with higher scores meaning higher perceived ability and controllability to attend PHPs. The original subscale that was developed by Thornton & Calam (2010) consisted of only two items and showed low internal consistency (Cronbach’s alpha = .69). As a result, another item was developed and added to ensure the stability of this subscale especially when running a factor analysis, because it is recommended that the number of items in a subscale should be at least three (Costello & Osborne, 2005). In our study, this subscale showed poor internal consistency (Cronbach’s alpha = .57). Item analysis showed that if the new item was deleted, Cronbach’s alpha would increase substantially to reach acceptable levels (Cronbach’s alpha = .71). So, a decision was made to remove the new item and use the original PBC subscale which consisted of two items. The range of scores in this case was 2 to 14.

Intention is defined as the person's readiness to engage in a particular behavior (Ajzen, 2005). In this study, the behavior is attendance at the PHP. Intention was measured using a subscale composed of three items (7-point response). The range of score is 3 to 21, with higher scores meaning higher intention to attend PHP. Intention was treated as a continuous variable. Regarding internal consistency “The TPB subscales ‘intention’, ‘subjective norm’, and ‘attitude’ all had alpha coefficients that exceeded the criterion of 0.7” (Thornton & Calam, 2010, p. 372). Since the original subscale consisted
of only two items, another item was added to increase the likelihood of the stability of 
this subscale especially when conducting a factor analysis, because the recommended 
minimum acceptable number of items in a subscale is three (Costello & Osborne, 2005). 
In our study, this subscale showed good internal consistency (Cronbach’s alpha = .84).

Finally, behavior is defined as the actual response of a person to a certain situation, in 
this study, attendance. Attendance rate was measured objectively using a checklist. The 
original plan was to record all days during length of stay in a PHP, but since each patient 
is scheduled to have a different duration of treatment; a decision was made to record a 
maximum of 10 consecutive days after consenting to participate in this study. This 
method controlled the effect of duration of treatment on attendance rate and it ensured 
comparability of attendance rate among subjects. Attendance rate was measured by using 
sratio of the actual attended days to the total scheduled days, and then it was multiplied by 
100%. The resulting percentage was interpreted as the higher the number, the higher the 
attendance rate. Attendance rate was treated as a continuous variable. The two PHPs in 
this present study has a 3 no-show policy, after that, a patient will be dismissed from the 
program. I took this policy into consideration when calculating attendance rate, especially 
for those who dropped out of the PHP.

Procedure

Institutional review board (IRB) approval was obtained from the study setting and 
from Kent State University before participant recruitment (Hulley et al, 2007). The IRBs 
also required submission of the instrument, the consent form, and the recruitment 
material. These were prepared and submitted along with the IRB application. The
recruitment process began by distributing flyers in the PHP which included the purpose of the study, inclusion/exclusion criteria, benefits of the study, and the principal investigator (PI) contact information. The gatekeepers (PHP staff including group therapists and case managers) were approached politely with the intent to build a supportive relationship with them (Byers, 1995), and then, a brief summary of the study was given to them. They were kindly asked to help introduce the study and the PI to PHP patients, and to make referrals to the PI of patients who were interested in participating. The PI met with any patient who was interested in this study and met the inclusion/exclusion criteria. Potential participants received a consent form from the PI who was physically available to explain the consent form and the questionnaire to the patients. Once the consent forms were signed, patients completed the questionnaire in a private room in the PHP. They returned the completed questionnaire either to the PI personally or placed it in a locked mail box that was designated for the study and easily accessible in the PHP. The questionnaire was distributed by the researcher to participants, and this gave them the opportunity to ask the researcher for clarifications regarding difficult or vague items. This is one of the advantages of in-person distribution of surveys as opposed to mailed or online questionnaires (Hulley et al, 2007).

Issues of non-response (i.e. refusal to participate in the study) were decreased by designing attractive flyers, consent forms, and questionnaire (Hulley et al, 2007). Strategies to decrease non-response included: the availability of the PI to physically recruit patients, assuring that there was no use of invasive procedures in this study (Hulley et al, 2007). Other strategies included: assuring subjects that the required information was not too sensitive or too personal, indicating that a short amount of time
(15-20 minutes) was needed to fill out the questionnaire in this one-time point study (Hulley et al, 2007).

Item non-response is also a possibility during data collection which may include misunderstanding some questions, choosing more than one response, or even not responding (missing data) to some items (Waltz et al, 2010). This issue was minimized by differentiating questions from the directions by using bigger font size. Also, important words were capitalized in addition to leaving enough space between questions which were developed using simple and familiar words (Dillman et al, 2009). Item non-response may be related to some sensitive questions that the participant will avoid answering or answering them according to social norms (social desirability) so that people will not judge them negatively (Waltz et al, 2010). This issue was considered in the informed consent by ensuring the confidentiality of responses and anonymity of subjects, and that there were no right or wrong answers (Waltz et al, 2010). Item non-response was treated carefully by preparing a codebook and standard guidelines to handle such issues systematically and consistently with all cases in the same way (Waltz et al, 2010).

**Protection of human subjects**

There are three ethical principles that were taken into consideration when conducting this study: respect for person, beneficence, and justice (Waltz et al, 2010). Respect for person means that the person has the option to voluntarily participate in the study (Waltz et al, 2010). Potential subjects were fully informed about the study before consent was requested which included detailed information about the purpose of the study, the right to refuse participation, the right to withdraw from the study or not provide information, the
confidentiality of information and risks/benefits of the study (Waltz et al, 2010). Patients with mental illness are considered a vulnerable population, but those who attend the PHP are considered stable (Soref & De Vries, 2005) and they have the mental and cognitive capacity to decide independently about their enrollment in this study. The second principle is beneficence which means doing good and avoiding doing harm and that the benefits of the study outweigh the risks (Hulley et al, 2007). The risk of harm to the participants as a result of this study were considered to be minimal because there were no invasive or physically strenuous procedures, and there was only one-time point of data collection (in a form of questionnaire) which decreased the burden for participants. The final principle is justice which means that the participants should have equal opportunity to participate in the study and that there should be an equal distribution of benefits and burdens (Hulley et al, 2007). Although this is a convenience sample, every effort was made to decrease selection bias by recruiting consecutively all individuals who met the inclusion/exclusion criteria. Finally, confidentiality was maintained by using a unique ID number for each subject, keeping data in a locked cabinet, and using password-protected access to the electronic version of the data (Waltz et al, 2010).

**Recruitment details**

I met with all patients who were admitted during recruitment. Initially, 68 subjects were recruited during five months (10/27/2015 - 3/28/2016), and six patients refused to participate. Three subjects did not return the survey, consequently, the final sample size was 65. The response rate was very high (91.9%), and this could be related to several factors, mentioned earlier, including the method of data collection (physical availability
of PI for recruitment and data collection), and using a relatively short survey that would be completed only one time.

Psychometrics of subscales

Reliability

There are different methods to assess reliability, but only internal consistency was tested, since only one-time point of data collection and one version of the questionnaire were used (Waltz et al, 2010). Internal consistency is an estimation of the extent of correlation between items of a certain instrument (Waltz et al, 2010). It can be measured using different methods but the most common method is coefficient (Cronbach’s) alpha which represents the average correlation of all possible split halves (Waltz et al, 2010). For an instrument to be considered internally consistent, it should achieve a desired Cronbach’s alpha of 0.8 (0.7 is acceptable), with higher values representing higher internal consistency (Hulley et al, 2007). Cronbach’s alpha is appropriate for items that are measured on a continuous level and this is consistent with the questionnaire that was used. Finally, item analysis was done to assess the quality of items and the need to modify, delete, or add other items to the instrument (DeVellis, 2012). This analysis included inter-item correlation, inspection of a correlation matrix, item means, item variances, corrected item to total correlation (i.e. the correlation between an item and the instrument), and alpha if an item was deleted (i.e. the degree of change on internal consistency measured by Cronbach’s alpha, if a certain item is deleted from the instrument) (DeVellis, 2012). As indicated earlier, the four subscales reached acceptable
levels of internal consistency (Attitude toward attendance = .88, Subjective norm = .71, Perceived behavioral control = .71, and intention to attend PHP = .84).

Validity

Validity of the questionnaire was assessed by estimating construct validity, which means the extent to which an instrument measures what is supposed to measure (Waltz et al, 2010). It is assessed using different methods, but in this study factor analysis was used to estimate the construct validity of the four subscales (Waltz et al, 2010). Factor analysis is done to assess the dimensionality of an instrument and its consistency with the theory constructs and its dimensions (Waltz et al, 2010). Therefore, all items from subscales that represent four distinct constructs: attitude toward the behavior, subjective norm, perceived behavioral control, and intention, will be entered. If the results of factor analysis indicate that there are four possible factors, and the items that originally represented a particular construct grouped under the corresponding factor, this will support the construct validity of the instrument (Waltz et al, 2010).

Factor analysis was performed using 14 items which represented four constructs (attitudes toward attendance, subjective norm, perceived behavioral control, and intention to attend). Principal component analysis was used as an extraction method, while direct oblimin was used as the rotation method for this analysis. Findings showed that Bartlett’s test was significant (Chi square = 501.7, p < .001), which supported factorability of items. Also, Kaiser-Meyer-Olkin (KMO) value was 0.80, which indicated good sampling adequacy and factorability of items. The factor solution, based on Eigenvalues >1 and explained variance > 5% for each factor, revealed that there were four factors.
representing the 14 items. Item loadings in the pattern matrix showed that items that were supposed to measure the same construct they grouped together. Item loadings for subjective norm, perceived behavioral control, and intention to attend PHP were higher than .4. This supported the construct validity of the theory of planned behavior constructs. Three items in the attitudes toward attendance subscale had small loadings. However, when I ran an item analysis of this subscale, they correlated well with other items, and Cronbach’s alpha would decrease if they were deleted. Also, these three items had strong loadings (higher than .7) in a study by Thornton and Calam (2010). So, a decision was made to keep them in the subscale.

External validity, which focuses on the extent to which the results could be generalized to the whole population, was examined through sample descriptive statistics (Shadish et al, 2001). Internal validity was examined to ensure that the results were truly related to the relationship between the variables of interest and not related to external or confounding variables (Shadish et al, 2001). This was performed by looking at the significance of results, effect size $R^2$, and threats that were controlled statistically or through the design and the process of conducting the study (Shadish et al, 2001). To control for confounding variables (e.g. patient’s relationship with staff or with other patients) that might affect the relationship between the TPB constructs and actual attendance, subjects were instructed to complete the survey within the first two days. Most patients decided to complete the survey right after consenting to participate in the study.
Random and Systematic Errors

Sources of random error (observer variability, instrument variability, and subject variability) and systematic error (response bias) should be controlled because they minimize the reliability and validity of scores (Hulley et al, 2007). Random error was decreased by using one version of the questionnaire, and using a consistent and standard method for recording actual PHP attendance. Carelessness is one source of response bias, and it was minimized by using the least number of items (taking into account reliability and parsimony) and short statements in both questions and responses (Waltz et al, 2010). Acquiescence, which means agreement with positively worded items, is another source of response bias which was minimized by inserting some negatively worded items (Waltz et al, 2010). Finally, social desirability is another source of response bias that was minimized by informing subjects in the informed consent that (a) no judgment will be made based on the responses, (b) there are no right or wrong answers and (c) confidentiality will be maintained and participants will not be identified (Waltz et al, 2010).

Data Management and Analysis

SPSS (version 23.0) and AMOS were used for data analysis. A code book was created through SPSS and printed to be used as a guide for data entry which might decrease the amount of errors during this process. Categorical variables such as gender, employment status, availability of insurance, and past history with PHP were dummy coded to facilitate data analysis. Data were entered using a unique identifier (ID number) for each participant which enabled de-identification of the participants. A password was
needed for the computer that was used for data entry and analysis, and a printed version along with a backup electronic version of entered data file were kept in a locked cabinet in a secure place (Hulley et al, 2007).

Data were screened for incorrect or extreme responses which are called outliers (Hulley et al, 2007). These outliers were identified by looking at standard deviations and box plots; any value that has more than 3 SDs and/or higher than 1.5 Inter-quartile IQR was considered an outlier (Munro, 2013). No outliers were found in this study. Data were screened for missing data, and the amount of missing data was very small. Consequently, pairwise deletion of cases was used during different types of statistical analyses.

Descriptive statistics including the mean, median, mode, SD, and range were calculated for subjects’ demographic and clinical characteristics, and for major constructs in the study. In addition, data were tested for normality of distribution which included the degree of skewness using Pearson’s skewness coefficient, and kurtosis using Fisher’s measure of kurtosis (Munro, 2013).

Path analysis was used to test the theoretical model in this study. Path analysis, which is conducted as a series of multiple regressions, allows the testing of the relationships among a group of variables (Kline, 2011; Munro, 2013). Consequently, the assumptions of multiple regression were evaluated. For example, the dependent variable should be a continuous variable (Munro, 2013), and this was consistent with actual attendance rate. Other assumptions include: the normal distribution of data, homoscedasticity of data which means that for each value of X, the amount of variability on Y should be equal, and linearity of data which was assessed by inspection of the scatter plots and the
correlation coefficients (Kline, 2011; Munro, 2013). Finally, the assumption of multicollinearity was investigated by looking at the correlation matrix. If some variables are highly correlated (higher than .85) and the model is not significant, then multicollinearity is expected (Munro, 2013). In our study, none of the bivariate correlations reached .7 which showed that no multicollinearity was running between constructs. Other specific tests to detect multicollinearity include tolerance and variance inflation factor VIF (Munro, 2013). If tolerance is less than or equal to 0.1 and if VIF is equal to or more than 10, this is a sign of multicollinearity (Polit, 2010). All of the TPB constructs had tolerance values higher than 0.1, and VIF values less than 10, which showed that no multicollinearity was running between constructs. There are specific assumptions related to using path analysis. For example, it is assumed that the flow of causation in the model is unidirectional which means the arrows are only going from independent (exogenous) variables to dependent (endogenous) variable(s). Also, all variables should be at an interval level of measurement (continuous) (Kline, 2011; Munro, 2013). In our study, none of these assumptions were violated.

Through path analysis we will be able to test several hypotheses at the same time:

1. Attitudes toward attendance, subjective norm, and perceived behavioral control have a significant direct effect on intention to attend. This can be tested by looking at the significance of the regression model in which intention to attend will be the dependent variable. Also, we can determine the significance of the relationships between each predictor and intention separately. In addition, we can determine the predictor that has the highest effect on intention by looking at beta weights of each predictor.
2. Intention to attend and perceived behavioral control have a direct effect on actual attendance rate. This can be tested by examining the significance of the regression model in which attendance rate will be the dependent variable. Also, we can determine the significance of relationship between each predictor (intention to attend and perceived behavioral control) and attendance rate separately. In addition, we can determine the predictor that has the highest effect on attendance rate by looking at beta weights of each predictor.

3. The over-identified model (i.e. no direct path between attitude toward behavior and PHP attendance rate, and no direct path between subjective norm and PHP attendance rate) fits the data as well as does the just-identified model (there is a direct path from each variable to other variables in the TPB).

4. Attitudes toward attendance, subjective norm, and perceived behavioral control have an indirect effect on attendance rate through intention. This can be tested and measured by tracing path coefficients originating from these predictors and multiplying them by the path coefficient going from intention to actual attendance rate.
Chapter 4

FINDINGS
Introduction

In this chapter, I will present the findings of this study. The first section includes the descriptive statistics related to two major categories: subjects’ characteristics and the theory of planned behavior constructs. The second section includes the four hypotheses of this study, and the findings related to each hypothesis. Finally, a summary of the findings is presented.

Subjects’ Characteristics

Demographic Characteristics

The average age of subjects was 36.6 years old, $SD = 14.9$, $Range = 18 - 69$. The majority were female, $n = 43$, 66.2%, and Caucasian, $n = 56$, 86.2%. Thirty-two (49.2%) subjects were single, while 22 (33.8%) were married. Twenty-two subjects (33.8%) reported “high school” as their highest level of education, while 16 (24.6%) and 15 (23.1%) of subjects had a two-year degree or Bachelor’s degree respectively. Forty-one subjects (63.1%) reported having a current employment. Among those, 30 subjects (73.2%) had a full-time job. Only 15 subjects (23.1%) had children at home, and the majority of them ($n = 9$, 60%) had one child (See Table 1).
Table 1

Subjects’ Demographic Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43 (66.2)</td>
</tr>
<tr>
<td>Male</td>
<td>21 (32.3)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>56 (86.2)</td>
</tr>
<tr>
<td>African American</td>
<td>4 (6.2)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2 (3.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (1.5)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>32 (49.2)</td>
</tr>
<tr>
<td>Married</td>
<td>22 (33.8)</td>
</tr>
<tr>
<td>Divorced</td>
<td>6 (9.2)</td>
</tr>
<tr>
<td>In committed relationship</td>
<td>3 (4.6)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (1.5)</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>22 (33.8)</td>
</tr>
<tr>
<td>2-year degree</td>
<td>16 (24.6)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>15 (23.1)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>7 (10.8)</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>3 (4.6)</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>23 (35.4)</td>
</tr>
<tr>
<td>Employed</td>
<td>41 (63.1)</td>
</tr>
<tr>
<td><em>Full-time</em></td>
<td>30 (73.2)</td>
</tr>
<tr>
<td><em>Part-time</em></td>
<td>11 (26.8)</td>
</tr>
<tr>
<td><strong>Children at home?</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>49 (75.4)</td>
</tr>
<tr>
<td>Yes</td>
<td>15 (23.1)</td>
</tr>
<tr>
<td><em>1 child</em></td>
<td>9 (60.0)</td>
</tr>
<tr>
<td><em>2 children</em></td>
<td>5 (33.3)</td>
</tr>
<tr>
<td><em>3 children</em></td>
<td>1 (6.7)</td>
</tr>
</tbody>
</table>
Clinical Characteristics

The majority of subjects ($n = 63, 96.9\%$) had health insurance that covers mental health treatment. Most ($n = 45, 69.2\%$) had a single psychiatric disorder. Major depression was the most reported single psychiatric disorder ($n = 34, 52.3\%$), followed by bipolar disorder ($n = 9, 13.8\%$). On the other hand, 19 subjects (29.2\%) reported having dual psychiatric diagnoses. Among subjects with dual diagnoses, major depression was the most common reported diagnosis ($n = 16, 84.2\%$). Generalized anxiety disorder was the second most reported (63.2\%), followed by obsessive compulsive disorder (21.1\%). (See Table 2)

Regarding subjects’ past experience with PHP, 44 (67.7\%) subjects indicated that it was their first admission to the PHP, while 21 (32.3\%) subjects reported having at least one previous admission to a PHP. Among those, 9 (56.3\%) subjects had only one previous admission to a PHP, while 5 (31.3\%) had two previous admissions to a PHP. Only two subjects had more than two previous admissions (5 subjects did not report number of previous admissions). Regarding the source of referral to the PHP, “individual psychiatrist” was the main source of referral ($n = 21, 32.3\%$), followed by inpatient psychiatric services referral ($n = 17, 26.2\%$). For those who were referred by inpatient psychiatric services, the average length of stay at inpatient services was 6.2 ($SD = 2.6$) days (64.7\% of the 17 subjects were hospitalized for less than 7 days). The majority of subjects ($n = 54, 83\%$) were aware of their treatment intensity (i.e. number of PHP treatment days/week). Regarding expected PHP duration of treatment, 23 (35.4\%) subjects expected that their duration of treatment would be no more than two weeks. On the other hand, 38 (58.4\%) subjects did not know their expected duration of treatment.
Table 2
Subjects’ Clinical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Insurance?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63 (96.9)</td>
</tr>
<tr>
<td>No</td>
<td>2 (3.1)</td>
</tr>
<tr>
<td>Type of single diagnosis (n = 46)</td>
<td></td>
</tr>
<tr>
<td>Major depression</td>
<td>34 (73.9)</td>
</tr>
<tr>
<td>Bipolar</td>
<td>9 (19.6)</td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>2 (4.3)</td>
</tr>
<tr>
<td>Did not know</td>
<td>1 (2.2)</td>
</tr>
<tr>
<td>Diagnoses of subjects with dual diagnosis</td>
<td></td>
</tr>
<tr>
<td>Major depression</td>
<td>16 (84.2)</td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>12 (63.2)</td>
</tr>
<tr>
<td>Obsessive compulsive disorder</td>
<td>4 (21.1)</td>
</tr>
<tr>
<td>Post-traumatic stress disorder</td>
<td>3 (15.8)</td>
</tr>
<tr>
<td>Borderline personality disorder</td>
<td>3 (15.8)</td>
</tr>
<tr>
<td>ADHD</td>
<td>1 (5.2)</td>
</tr>
<tr>
<td>First PHP admission?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44 (67.7)</td>
</tr>
<tr>
<td>No</td>
<td>21 (32.3)</td>
</tr>
<tr>
<td>1 previous admission</td>
<td>9 (56.3)</td>
</tr>
<tr>
<td>2 previous admissions</td>
<td>5 (31.3)</td>
</tr>
<tr>
<td>3-5 previous admissions</td>
<td>2 (12.6)</td>
</tr>
<tr>
<td>Source of referral</td>
<td></td>
</tr>
<tr>
<td>Individual psychiatrist</td>
<td>21 (32.3)</td>
</tr>
<tr>
<td>Inpatient services</td>
<td>17 (26.2)</td>
</tr>
<tr>
<td>Outpatient clinic</td>
<td>12 (18.5)</td>
</tr>
<tr>
<td>Self</td>
<td>6 (9.2)</td>
</tr>
<tr>
<td>Individual therapist</td>
<td>6 (9.2)</td>
</tr>
<tr>
<td>Parents/family</td>
<td>3 (4.6)</td>
</tr>
<tr>
<td>Knowledge of treatment intensity</td>
<td></td>
</tr>
<tr>
<td>Yes (4 or 5 days/week)</td>
<td>54 (83)</td>
</tr>
<tr>
<td>Did not know</td>
<td>11 (17)</td>
</tr>
<tr>
<td>Expected duration of treatment</td>
<td></td>
</tr>
<tr>
<td>5-14 days</td>
<td>23 (35.4)</td>
</tr>
<tr>
<td>16-28 days</td>
<td>4 (6.2)</td>
</tr>
<tr>
<td>Did not know</td>
<td>38 (58.4)</td>
</tr>
</tbody>
</table>
Theory of planned behavior constructs: Descriptive statistics

The total score of Attitude Toward Attendance [ATA] subscale indicates that a person has a negative ATA if the score was less than 24, while positive ATA is suggested if the total score was higher than 24. In this study, subjects had a slightly positive attitude toward attending PHP (See Table 3). The total score of Subjective Norm [SN] subscale indicates perceived disapproval from family and significant others toward attending a PHP if the total score was less than 12, while a total score higher than 12 indicates perceived approval. In this study, subjects reported having high perceived approval from family and significant others toward attending the PHP. Regarding the Perceived Behavioral Control [PBC] subscale, a total score less than 8 indicates less control and ability to attend PHP, while scores higher than 8 indicate higher control and ability to attend PHP. In this study, subjects reported, on average, having high control and ability to attend the PHP. Finally, if the total score of the Intention to Attend subscale is less than 12, it means that a person is not intending to attend a PHP regularly, while scores higher than 12 means that a person is intending to attend PHP regularly. In this study, subjects reported, on average, having very high intentions to attend the PHP regularly (See Table 3).

Regarding PHP attendance rate, which is the percentage of total days attended to the total scheduled days, the mean score was very high, $M = 92.84\%, \ SD = 17.91$, $Range = 25\% - 100\%$ (See Table 3). Only 4 (6.2\%) subjects had an attendance rate of less than 50\%, while 11 (16.9\%) subjects had an attendance rate of less than 85\%. The majority of subjects ($n = 51, 78.5\%$) had 100\% attendance rate. Calculations of PHP attendance rate depended on several factors such as the total number of attended days, the total number
of no-shows, and the total number of scheduled-off days. On average, subjects attended approximately 7 days, $M = 7.06, SD = 2.61, Range = 1-10$. Only 11 (16.9%) subjects attended less than 5 days, while the majority ($n = 42, 64.6\%$) attended more than 7 days. On the other hand, the mean number of no-show was 0.40 days, $SD = 0.86, Range = 0 - 3$. The majority of subjects had zero no-show record, $n = 51 (78.5\%)$. Finally, the mean number of scheduled-off days was 0.48 days, $SD = 0.81, Range = 0 - 3$.

Table 3

*Theory of Planned Behavior Constructs: Descriptive Statistics*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Number of items (cut point)</th>
<th>$M(SD)$</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Toward Attendance</td>
<td>6 (24)</td>
<td>32.77 (5.59)</td>
<td>10-42</td>
<td>33</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>3 (12)</td>
<td>17.14 (3.29)</td>
<td>5-21</td>
<td>18</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>2 (8)</td>
<td>11.34 (3.05)</td>
<td>2-14</td>
<td>12</td>
</tr>
<tr>
<td>Intention to Attend PHP</td>
<td>3 (12)</td>
<td>18.77 (3.28)</td>
<td>3-21</td>
<td>20</td>
</tr>
<tr>
<td>PHP Attendance Rate (%)</td>
<td>NA</td>
<td>92.84 (17.91)</td>
<td>25-100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Study Hypotheses**

**Hypothesis 1.** *Attitude Toward Attendance [ATA], Subjective Norm [SN], and Perceived Behavioral Control [PBC] have a significant direct effect on intention to attend.*

I used a regression model to predict intention to attend. (See Table 4.) ATA was the
only significant predictor of intention to attend, $\beta = .63, p < .001$. The effects of SN and PBC on intention to attend PHP were not significant. The whole model was significant, $Adjusted R^2 = .47, F (3, 64) = 19.62, p < .001$. This means that 47% of variance in subjects’ intention to attend score is related to their ATA. This model showed large effect size, $f^2 = .886$.

Table 4

*Regression Model to Predict Intention to Attend PHP*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Constant</td>
<td>3.10</td>
<td>2.29</td>
</tr>
<tr>
<td>ATA</td>
<td>.37</td>
<td>.06</td>
</tr>
<tr>
<td>SN</td>
<td>.18</td>
<td>.09</td>
</tr>
<tr>
<td>PBC</td>
<td>.05</td>
<td>.10</td>
</tr>
</tbody>
</table>

**Hypothesis 2. Intention to attend PHP and Perceived Behavioral Control [PBC] have a direct effect on PHP attendance rate.**

I used a regression model to predict PHP attendance rate. (See Table 5.) The whole model was significant, $Adjusted R^2 = .12, F (2, 64) = 5.17, p = .008$. This means that 12% of variance in subjects’ PHP attendance rate is related to their PBC. This model showed medium effect size, $f^2 = .14$. PBC was the only significant predictor of PHP attendance rate, $\beta = .38, p = .002$. Surprisingly, intention to attend PHP had a small non-significant effect on PHP attendance rate.
Table 5

*Regression Model to Predict PHP Attendance Rate*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized coefficients</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>β</td>
<td>t</td>
<td>Sig.</td>
</tr>
<tr>
<td>Constant</td>
<td>77.74</td>
<td>13.74</td>
<td>5.67</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Intention to attend PHP</td>
<td>-.54</td>
<td>.65</td>
<td>-.10</td>
<td>-.83</td>
<td>.411</td>
</tr>
<tr>
<td>PBC</td>
<td>2.22</td>
<td>.67</td>
<td>.38</td>
<td>3.19</td>
<td>.002</td>
</tr>
</tbody>
</table>

**Hypothesis 3.** *The over-identified model (i.e. no direct path between attitude toward behavior and PHP attendance rate, and no direct path between subjective norm and PHP attendance rate) fits the data well.*

I used AMOS software to examine this hypothesis. This software enabled testing the theoretical/path model of this study which showed path coefficients, co-variances, and error terms. (See Figure 2.) Now, we can test whether the over-identified/reduced model (i.e. no direct paths from ATA and SN toward PHP attendance rate) fits the data well.

The chi-square test, which is known as CMIN in AMOS, was used to test the null hypothesis that the over-identified/reduced model fits the data well. The chi-square test was not significant, \( CMIN = .053, df = 2, p = .974 \), and thus, we accept the null hypothesis. (See Table 6.) This means that the fit of our proposed (over-identified/reduced) model with data is not significantly different from the fit of the just-identified/saturated model. Another fit index is the ratio of chi-square to degrees of freedom, known as CMIN/DF. High CMIN/DF values (e.g. 2-3) indicate that the over-
identified model was reduced more than desired. In this study, CMIN/DF was very low (.027), which supports the fit of the model with the data.

Figure 2. Path model for the Theory of Planned Behavior

NS: not significant
Another index of the model fit with data is the Root Mean Square Residual (RMR), which examines the difference between the estimated variances and covariance by our reduced model to the observed variances and covariance. (See Table 7.) In this current study, RMR was very small (.500), which supports the fit of our model with the data. The Goodness of Fit Index (GFI) showed that the proposed model had a good fit (GFI= 1.0), since the recommended value should be higher than .9 (See Table 4.6). The third group of fit indices is the Root Mean Square Error of Approximation (RMSEA) that estimates the lack of fit compared to the just-identified (saturated) model. If the value of RMSEA is less than .05, it indicates a good fit. RMSEA in our study was less than .001, which support the fit of our model with the data. (See Table 7.)
Table 7

*Path Model Fit Indices: Root Mean Square Residual (RMR), the Goodness of Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA)*

<table>
<thead>
<tr>
<th>Model</th>
<th>RMR</th>
<th>GFI</th>
<th>AGFI</th>
<th>PGFI</th>
<th>RMSEA</th>
<th>PCLOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced model</td>
<td>.500</td>
<td>1.00</td>
<td>.998</td>
<td>.133</td>
<td>.000</td>
<td>.978</td>
</tr>
<tr>
<td>Saturated model</td>
<td>.000</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent model</td>
<td>6.230</td>
<td>.757</td>
<td>.635</td>
<td>.504</td>
<td>.274</td>
<td>.000</td>
</tr>
</tbody>
</table>

The last group of model fit indices includes the Normed Fit Index (NFI), which is calculated by dividing the difference between the chi-square of the reduced (over-identified) model and the full (just-identified) by the chi-square of the independent model. A NFI value higher than .9 indicates a good fit. In our study, the NFI value was .999, which indicates a good fit. (See Table 8). In summary, all of the fit indices support a good fit of the model.

Table 8

*Path Model Fit Indices: The Normed Fit Index (NFI), and Parsimony-Adjusted Measures*

<table>
<thead>
<tr>
<th>Model</th>
<th>NFI Delta1</th>
<th>RFI rho1</th>
<th>IFI Delta2</th>
<th>TLI rho2</th>
<th>CFI</th>
<th>PRATIO</th>
<th>PNFI</th>
<th>PCFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default/reduced model</td>
<td>.999</td>
<td>.995</td>
<td>1.035</td>
<td>1.202</td>
<td>1.00</td>
<td>.200</td>
<td>.200</td>
<td>.200</td>
</tr>
<tr>
<td>Saturated model</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Independent model</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>1.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>
Hypothesis 4. Attitudes Toward Attendance (ATA), Subjective Norm (SN), and Perceived Behavioral Control (PBC) have an indirect effect on attendance rate through intention.

I used AMOS software to examine this hypothesis. This software enabled testing the theoretical model of the study that showed path coefficients, co-variances, and error terms. (See Figure 2.) Now, we can trace direct effects, indirect effects, and total effects of the TPB constructs on PHP attendance rate. Fortunately, AMOS software calculates these effects automatically. Regarding the total effect, ATA had the highest total effect on intention to attend PHP, while PBC had the highest total effect on attendance rate. (See Table 9) Regarding the indirect effect, ATA, SN, and PBC had no indirect effect on PHP attendance rate through intention to attend. (See Table 4.11.)

Table 9

Standardized Total Effects

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Exogenous variable</th>
<th>PBC</th>
<th>SN</th>
<th>ATA</th>
<th>Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td></td>
<td>.045</td>
<td>.178</td>
<td>.628</td>
<td>.000</td>
</tr>
<tr>
<td>Attendance Rate</td>
<td></td>
<td>.374</td>
<td>-.018</td>
<td>-.062</td>
<td>-.098</td>
</tr>
</tbody>
</table>

Table 10

Standardized Direct Effects

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Exogenous variable</th>
<th>PBC</th>
<th>SN</th>
<th>ATA</th>
<th>Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td></td>
<td>.045</td>
<td>.178</td>
<td>.628</td>
<td>.000</td>
</tr>
<tr>
<td>Attendance Rate</td>
<td></td>
<td>.379</td>
<td>.000</td>
<td>.000</td>
<td>-.098</td>
</tr>
</tbody>
</table>
Table 11

*Standardized Indirect Effects*

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Exogenous variable</th>
<th>PBC</th>
<th>SN</th>
<th>ATA</th>
<th>Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Attendance Rate</td>
<td>-0.004</td>
<td>-0.018</td>
<td>-0.062</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

**Summary of findings**

The sample consisted mainly of relatively young Caucasians who had major depression. Subjects reported, on average, having positive attitudes toward PHP attendance, perceived approval from family and significant others toward attending PHP, and having control over attending the PHP. The majority had very high intentions to attend PHP and achieved a very high PHP attendance rate. The regression model that included ATA, SN, and PBC successfully predicted subjects’ intention to attend PHP, although ATA was the only predictor that had a significant contribution in predicting intentions. The regression model that included PBC and intention to attend PHP successfully predicted subjects’ PHP attendance rate, although PBC was the only predictor that had a significant contribution in predicting PHP attendance rate. Our over-identified (reduced) model had a good fit with data, and is not different from the full/saturated model in explaining data. This was supported by all model fit indices such as chi-square test, RMR, GFI, RMSEA, and NFI. Finally, ATA, SN, and PBC, had no indirect effects on PHP attendance rate through intention to attend PHP.
Chapter 5

DISCUSSION
In this study, the TPB was used to predict intention to attend PHP and actual PHP attendance rate. This chapter includes a discussion and interpretation of study findings. Details about study limitations, strengths, future recommendations, and nursing implications are also addressed. Finally, a conclusion of the study is presented.

**PHP attendance rate**

Subjects had a very high attendance rate (84% of participants had 80% or higher attendance rate), and this reflects a high adherence level to this type of mental health treatment. This rate was higher than those reported by Evans (1992) who found that 60% of participants had 80% or higher PHP attendance rate. This could be related to several reasons. First, the majority of subjects were Caucasians and highly educated. Previous literature showed that people with similar characteristics were more likely to have higher mental health treatment attendance than others, presumably because they usually have lower levels of mental illness-related stigma, higher socio-economic status, and more positive attitude toward mental health treatment (Alonzo et al., 2011; Arnow et al., 2007; Barret et al., 2008; Graff et al., 2008; Wang et al., 2005). Second, the majority of subjects had health insurance coverage for mental health treatment, and they did not have children at home. These factors may have decreased some of the barriers to treatment such as lack of accessibility to treatment and caregiver responsibilities (Defife et al., 2010; Edlund et al., 2002; Gorman, Blow, Ames, & Reed, 2011). This may explain the significant positive relationship between perceived behavioral control and PHP attendance rate (discussed below). Finally, orientation to the PHP that was provided by the staff before the first day,
and recruiting in this study only those who were able to attend the first day of PHP might explain the participants’ high perceived control/ability to attend PHP, and ultimately, improved actual attendance rate.

**Predictors of intention to attend PHP**

The findings indicate that participant intention to attend PHP was predicted by their attitudes toward PHP attendance (hypothesis 1). This means that patients with mental illness who had a positive attitude toward PHP attendance had higher intentions to attend PHP. This is consistent with the TPB propositions and previous research (Bayer & Peay, 1997; Mak & Mark, 2014; Mazzotti & Barbaranelli, 2012; Mesidor & Sly, 2014; Mo & Mak, 2009; Schomerus, Matschinger & Angermeyer, 2009; Skogstad, Deane & Spicer, 2006; Woods, 2013). In this study, attitude toward PHP attendance accounted for 47% of the explained variance in the participants’ intentions to attend PHP. This amount of variance is similar to that found in previous research. For example, Schomerus, Matschinger & Angermeyer, (2009) found that attitude toward seeking mental health treatment, subjective norm, and perceived behavioral control accounted for 50% - 61% of explained variance in intention of patients with depression to seek mental health treatment, while Mo and Mak (2009) found that the same predictors accounted for 57% of the variance. It is important to note that those researchers included more predictors in their models, which might explain the increased amount of variance. Mazzotti and Barbaranelli, (2012) found that attitude toward completing mental health treatment, subjective norm, and perceived behavioral control accounted for 37% of the explained variance for intention to complete or drop out of mental health treatment. A meta-analysis of 185 articles found that attitude toward a behavior, subjective norm, and perceived
behavioral control accounted for 39% of variance for intention (Armitage & Conner, 2001).

The findings from this study indicate that attitude toward PHP attendance is the only predictor of intention to attend PHP. This is consistent with previous literature (Bayer & Peay 1997; Mo & Mak, 2009; Schomerus, Matschinger & Angermeyer, 2009). The findings suggest that efforts by PHP staff to improve patients’ attitudes toward attendance, which are affected by patients’ beliefs of the expected outcomes of PHP, would increase intention to attend. One way to accomplish this may be to educate prospective patients about the evidence-based outcomes of PHP completion such as significant improvement in symptoms, functionality, coping skills, and social skills.

Subjective norm was not a significant predictor of intention to attend PHP. This could be related to its common variance (i.e. correlation) with attitude toward attendance, which decreased its unique contribution in the prediction model. In general, subjective norm is affected by the cultural background of subjects, especially with mental health treatment. People from eastern cultures and ethnic minorities, such as African Americans, are more likely to have higher levels of stigmatizing attitudes to mental illness than Caucasians. These cultural groups also have stronger social relationships and higher social pressure than Caucasians (Lee, Lee, Chiu, & Kleinman, 2005; Mak & Mark, 2014; Mo & Mak, 2009; Philips, Pearson, Li, Xu, & Yang, 2002; Tsang, Tam, Chan, & Cheung, 2003; Woods, 2013; Yang, 2007). Previous studies conducted on people from eastern cultures or ethnic minorities showed that subjective norm accounted for a significant strong prediction power on intention (Mak & Mark, 2014; Mo & Mak, 2009; Woods, 2013). This study was conducted in the United States, and the majority of
subjects were Caucasians. This may explain why subjective norm had a non-significant effect on intention to attend PHP. Another possible reason for non-significant effect is the use of a small sample size, and the lack of variability in sample demographic and clinical characteristics.

In this study, perceived behavioral control had a non-significant prediction effect on intention to attend PHP. This is consistent with previous literature (Mo & Mak, 2009; Schomerus, Matschinger & Angermeyer, 2009; Woods, 2013). Researchers found that the more voluntary control a patient had over the behavior (higher perceived behavioral control), the lower the association between perceived behavioral control and intention (Mak & Mark, 2014; Mo & Mak, 2009; Montano & Kasprzyk, 2002; Schomerus, Matschinger & Angermeyer, 2009). High perceived behavioral control is related to the availability of mental health treatment facilities and health insurance coverage for mental health treatment (Mak & Mark, 2014; Mo & Mak, 2009; Schomerus, Matschinger & Angermeyer, 2009). The majority of participants in our study had insurance coverage for mental health treatment and mental health services were accessible. This may explain the high voluntary control and ability they had to attend PHP and account for the lack of association between intention and perceived behavioral control. Also, it may explain the strong significant predictive power of perceived behavioral control on the actual behavior, PHP attendance rate. Another possible reason for the non-significant effect of PBC on intention to attend PHP is related to the small sample size, and the lack of variability in sample demographic and clinical characteristics.

In summary, studies that reported the strength of effect of the TPB constructs varied in relation to the behavior of interest (e.g. feasibility of behavior), sample characteristics
(e.g. gender differences), and situational factors (e.g. effect of cultural background). This is supported by Ajzen’s (1991) explanation of the TPB.

**Predictors of PHP attendance rate**

The findings indicate that participants’ attendance rate was predicted by their perceived behavioral control (hypothesis 2). This is consistent with part of the propositions of the TPB (Fishbein & Ajzen, 2010). The surprising finding of this study is that intention to attend PHP did not predict actual PHP attendance rate. They were not significantly correlated. This explains the low explained variance (12%) of PHP attendance rate achieved only by perceived behavioral control. This finding contradicts the basic assumption of the TPB and the findings of many research studies that reported a significant strong positive correlation between intention and actual behavior (Fishbein & Ajzen, 2010). However, our findings were consistent with Mazzotti & Barbaranelli (2012) study findings (N = 239) who used intention to complete mental health treatment and past experience with mental health treatment, to predict completion or dropping out of mental health treatment. They found that the model accounted for 10% of explained variance for the behavior (completion vs. dropping out). They also found that intention to complete mental health treatment had a non-significant prediction effect on the behavior (Mazzotti & Barbaranelli, 2012). The strongest predictor in their model was past experience with mental health treatment, suggesting that habit (past completion or drop out) had a stronger effect on the behavior than intention (Mazzotti & Barbaranelli, 2012).

In the present study, one possible reason for the non-significant relationship between intention and PHP attendance rate is related to the small sample size, and the lack of variability in sample demographic and clinical characteristics.
Perceived behavioral control was the only predictor of attendance rate. This concept is affected by control beliefs which means a person’s perception of facilitators and barriers of performing a particular behavior (Fishbein & Ajzen, 2010). Perceived behavioral control is very closely related to the concept of perceived costs/barriers to treatment, a concept that is included in the health belief model. Consequently, our findings are consistent with Evans (1992) who found that perceived costs/barriers to treatment predicted PHP attendance rate. In the present study, several facilitators and fewer barriers were found. For example, the majority of participants had insurance coverage for mental health treatment and mental health services were accessible. Also, the majority were Caucasians who are usually have lower levels of mental illness-related stigma. Finally, the majority did not have children at home and this decreased their caregivers’ responsibilities.

**Theory of planned behavior: Predictive power and fit indices**

I tested the fit of the over-identified/reduced model, which is similar to the original TPB model. All of the model fit indices indicated that the over-identified model fit the data as well as did the just-identified/full model (hypothesis 3). In addition, the large effect size for predicting intention ($f^2 = .89$), and the medium effect size for predicting PHP attendance ($f^2 = .14$) supported the fit of the TPB with data. This partially support the suitability of this theory in predicting participation in many healthy behaviors such as physical activity, smoking cessation, blood donation, condom use, and breast self-examination (Fishbein & Ajzen, 2010). More importantly, the findings were consistent with other research that supported the usefulness of the TPB in predicting intentions to participate in mental health treatment, (Bayer & Peay, 1997; Compton & Esterberg,
It is interesting to note that several researchers compared the TPB and the Health Belief Model (HBM) and found that the TPB is better than HBM in predicting intentions and behaviors. For example, Thornton and Calam (2010) compared the predictive validity of the TPB and HBM in measuring intentions to attend a universal parent-training program for parents of children with behavioral difficulties. Their findings indicated that both models significantly predicted parents’ intention to attend the program but the TPB accounted for more variance (54.5%) than the HBM (32.3%). Also, Buscemi (2003) found that both the TPB and the HBM predicted the intention of patients with mental illness and their families to enact an advanced directive applying to psychiatric care. However, the TPB had a stronger predictive power than the HBM (Buscemi, 2003). Finally, Şimşekoğlu & Lajunen (2008) conducted a study in Turkey to compare the predictive validity of the TPB and HBM in terms of use of seatbelts by front seat passengers. They found that the TPB model had a good fit to the data, while the HBM fitted poorly (Şimşekoğlu & Lajunen, 2008).

Finally, the indirect effects of attitude toward PHP attendance, subjective norm, and perceived behavioral control on actual PHP attendance rate through intention were calculated. In the present study, their indirect effects were very small, and did not add a significant amount to the total effect on PHP attendance rate. This could be related to the unexpected small direct effect of intention to attend on PHP attendance rate. Indirect effects are calculated by multiplying the direct effect of each predictor (standardized...
beta) with the direct effect of intention on the behavior, which was small (-.10) and not significant.

The last step in path analysis is model re-specification or trimming, which means modifying the proposed model to achieve a better fit (Kline, 2011). There are two types of model re-specification: empirical re-specification and theoretical re-specification. In empirical re-specification, AMOS software automatically delete non-significant path coefficients to create a trimmed model, which usually has a better fit (Kline, 2011). On the other hand, theoretical re-specification means that we should consider the theory that was used to create the path model (Kline, 2011). Theoretical re-specification also means we should not simply delete path coefficients just because they are not-significant (Kline, 2011). Doing so, may increase the likelihood of type II error, because we are simply arguing that there is no relationship, but in reality, this relationship could exist (Kline, 2011). In this present study, I decided not to drop the non-significant path coefficients based on theoretical re-specification. Also, I decided not to drop the non-significant path coefficients because I am using the TPB, one of the most established theories that showed its success in predicting intentions and behaviors in thousands of studies. Replicating this study using a larger and more representative sample, may result in having more significant path coefficients.

**Limitations and future recommendations**

There are several limitations in this study. First, the use of a convenience sampling method limited the representativeness and, ultimately, the generalizability of the findings. For example, the majority of participants were Caucasians, relatively young (36 years
old), and had major depression as their primary diagnosis. So, generalizing the findings to another population who has different characteristics is not recommended. Random sampling methods would increase the probability of representativeness of study sample (e.g. more subjects from ethnic minority groups), which will improve the generalizability of findings.

Another limitation is that the sample size was relatively small and this could have affected the significance and strength of relationships. Also, this small sample size will not permit further analysis in the future to examine the fit of an extended theoretical model with data. So, a larger sample size (e.g. it is recommended to have 10 subjects per parameter) is required in future studies to account for testing various extended models. These extended models will include demographic and clinical factors such as age, gender, type of diagnosis, severity of symptoms, and number of past PHP admissions. Some of these factors showed significant association with mental treatment attendance, and some of them showed conflicting results. So, it is important to test their effect on attendance as part of an extended TPB model in spite of Ajzen’s recommendation that adding these variables will not improve the amount of explained variance substantially.

An additional limitation is related to the method for measuring the length of attendance rate, which was a maximum of ten working days. This could affect the precision of measurement, and thus, future studies should measure attendance rate until participants are discharged or drop out of treatment. Finally, I did not collect data about the reason for discharge. Therefore, future studies should consider identifying the reason of discharge (e.g. step up to inpatient services because of relapse, symptom improvement,
or unplanned discharge) because it may improve an understanding of the factors that affect intention to attend mental health treatment and actual attendance.

**Strengths**

Several strengths of this study should be considered. First, the use of a behavior-related theory to examine the effect of predictors on intention to attend PHP and actual PHP attendance rate was the best approach to guide the study in developing precise research questions. This decision also enabled comparison with other research that used the same theory. Second, this is one of the few studies that examined not just intention to attend mental health treatment (i.e. PHP), but also the actual behavior, PHP attendance rate. This increased the ability to establish the association between predictors and the behavior. Also, this is one of the few studies that measured attendance rate to estimate level of adherence to mental health treatment which has several advantages over other measurement methods such as completion status or first/initial contact status. For example, attendance rate is more precise in determining the level of adherence, because it gives a percentage which may range between 0-100 percent, while other measures (completion status or first/initial contact status) assign yes or no values to estimate adherence level, which limit their variability.

**Implications for practice and research**

Mental health professionals, including registered nurses and psychiatric nurse practitioners, should assess patients’ attitudes toward attending mental health treatment and perceived behavioral control during the admission or intake process. This would enable estimation of the patient’s intention to attend mental health treatment and actual
treatment attendance. Next, mental health professionals should focus on improving patients’ perceptions of behavioral control, since it was the only predictor of actual attendance, by identifying perceived barriers of attendance. These barriers may include: availability of health insurance coverage of mental health treatment (Edlund et al., 2002; Gorman, Blow, Ames, & Reed, 2011), availability of transportation (Alnamlah, 2006; Booth & Bennett, 2004; Kruse & Rohland, 2002), distance between home and the mental health facility, marital-family problems, family commitment, family member’s illness, and work conflicts (Defife et al., 2010). PHP staff should communicate with patients and their families to find solutions for these barriers.

PHP staff can work on improving patients’ attitude toward attendance, which are affected by patients’ beliefs of the expected outcomes of PHP. During admission, PHP staff can explain the expected positive outcomes of PHP completion such as significant improvement in symptoms, functionality, coping skills, and social skills. Staff can also provide patients with research articles that shows the effectiveness of partial hospitalization.

Mental health professionals can consider mental health treatment attendance rate as a proxy for treatment adherence. Mental health professionals and researchers, in general, can use the TPB to create questionnaires for the purpose of explaining and predicting behaviors related to mental health treatment such as actual attendance rate, completion status, and seeking mental health treatment.
Conclusion

This study highlighted the clinical and financial importance of attending and adhering to mental health treatment such as a PHP. A review of the literature showed that there are several demographic, clinical, and personal factors that affect mental health treatment attendance. However, these factors were chosen arbitrarily without theoretical reasoning. Consequently, the theory of planned behavior was used to guide this study for the purpose of determining the predictors of PHP attendance. The findings of this study partially supported the utility of this theory in explaining and predicting intentions to perform behaviors and actual behaviors. Patients’ attitude toward attending PHP was the only predictor of intention to attend PHP, while perceived behavioral control was the only predictor of the PHP attendance rate. Further research is needed to examine the effect of particular demographic and clinical factors on mental health treatment attendance. These factors may include those that moderated mental health treatment attendance such as gender, race/ethnicity, and number of past PHP admissions. Finally, future studies that will use similar methodologies should use a larger sample size.
Appendix A. Theory of planned behavior
Appendix B. Survey of Predictors of Partial Hospitalization Attendance

Survey of Predictors of Partial Hospitalization Attendance

Mohammed Aldalaykeh, PhD(c)

Kent State University College of Nursing

Email: maldalay@kent.edu

Telephone number: 330-389-4770
a) What is your age?________

b) What is your gender?_______Male _______Female

c) What is your ethnicity/race?
   _____Caucasian _____________African American
   _____Asian ________________Hispanic
   _____Other, please specify ________________

d) What is your marital status?
   _____Married _______________Divorced
   _____Single ________________Widowed
   _____In a committed relationship
   _____Other, please specify__________

e) What is the highest level of education achieved?
   _____High school _____________Vocational/Technical school (2 year)
   _____Bachelor’s degree __________Master’s degree
   _____Doctoral degree ___________Other, please specify__________

f) Are you currently employed?
   _____No _______Yes

   If yes, what is the type of your work?
   _____Full time _____Part time

g) Do you have children under 16 years old who live in your household?
   _____No _______Yes, please specify the number ________
h) Do you currently have a health insurance that covers PHP services?
   ____No    ____Yes

i) What is your diagnosis? Please, check all that apply?
   ____Major Depression       ____Schizophrenia
   ____Bipolar
   ____Other, please specify______________________________
   ____Don’t know

j) Is this your first admission to a PHP?
   ____No    ____Yes
   If No, how many times you were admitted to PHPs? ________ times

k) What is the source of referral to a PHP?
   ____Inpatient
   ____Outpatient clinic
   ____Self
   ____Other, please specify______________________________

l) If you were hospitalized recently at an inpatient psychiatric ward, how many days did you stay there? ________

m) What is your current expected PHP duration of treatment?____________________   ____Don’t know

n) How many days per week are you required to attend at the PHP?
   ___________days                      ____Don’t know
Instructions

Many questions in this survey make use of rating scales with 7 places; you are to circle the number that best describes your opinion. For example, if you were asked to rate "The Weather in Akron" on such a scale, the 7 places should be interpreted as follows:

The Weather in Akron is:
good : ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : bad
 extremely quite slightly neither slightly quite extremely

If you think the weather in Akron is extremely good, then you would circle the number 1, as follows:
The Weather in Akron is:
good : ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : bad

If you think the weather in Akron is quite bad, then you would circle the number 6, as follows:
The Weather in Akron is:
good : ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : bad

If you think the weather in Akron is slightly good, then you would circle the number 3.
The Weather in Akron is:
good : ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : bad

If you think the weather in Akron is neither good nor bad, then you would circle the number 4.
The Weather in Akron is:
good : ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : bad

In making your ratings, please remember the following points:
* Try to answer all items.
* Never circle more than one number on a single scale.
1. Attending this partial hospitalization program (PHP) on a regular basis is extremely difficult: 1: 2: 3: 4: 5: 6: 7: extremely easy

2. Most people who are important to me think that I should not: 1: 2: 3: 4: 5: 6: 7: I should attend this PHP

3. For me to attend this PHP on a regular basis is extremely harmful: 1: 2: 3: 4: 5: 6: 7: extremely beneficial

4. I plan to attend this PHP on a regular basis extremely unlikely: 1: 2: 3: 4: 5: 6: 7: extremely likely

5. Whether or not I attend this PHP on a regular basis is completely up to me Strongly disagree: 1: 2: 3: 4: 5: 6: 7: Strongly agree

6. For me to attend this PHP on a regular basis is extremely useless: 1: 2: 3: 4: 5: 6: 7: extremely useful

7. Most people who are important to me would also attend this PHP if needed definitely false: 1: 2: 3: 4: 5: 6: 7: definitely true

8. For me to attend this PHP on a regular basis is extremely unpleasant: 1: 2: 3: 4: 5: 6: 7: extremely pleasant
9. I will make an effort to attend this PHP on a regular basis

I definitely will not: 1 : 2 : 3 : 4 : 5 : 6 : 7 : I definitely will

10. Attending this PHP on a regular basis is beyond my control


11. Most people who are important to me would want me to attend this PHP

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

12. For me to attend this PHP on a regular basis is


13. I intend to attend this PHP on a regular basis

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

14. For me to attend this PHP on a regular basis is


15. For me to attend this PHP on a regular basis is

Appendix C. Attendance Checklist

Check list of daily attendance

ID_____

<table>
<thead>
<tr>
<th>Day number</th>
<th>Date</th>
<th>Attendance</th>
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<tbody>
<tr>
<td>1</td>
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