Impact of SMS Reminders on CBT Appointments

Dr Qasim Hameed Afridi

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ABSTRACT

SMS text message appointment reminders were sent to clients attending cognitive behaviour therapy to see if they improve attendance rates in outpatient clinics. The study is limited in its scope as very few clients volunteered to participate. The available data has been analyzed. In future if someone gathers a greater amount of data, this work could provide a reference and guideline for how one should conduct the research. The research approach adopted is randomized controlled trial. Due to the shortage of recruits in the study, the data were supplemented with interviews. Results do not show an improvement in outpatient attendance rates with text message reminders. Further research is required and a longer duration to run the experiment to detect any statistical significant difference in attendance rates at cognitive behaviour therapy clinics because of text message appointment reminders.

DECLARATION

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other University.

Signed: _____

Qasim Afridi

September, 2011

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ABBREVIATIONS

CBT: Cognitive Behavioural Therapy

SMS: Short Messaging Service

NHS: National Health Service

FTA: Failure to Attend

DNA: Did Not Attend

RCT: Randomised Controlled Trial

GSM: Global System for Mobile Communications, originally Groupe Spécial Mobile

CHAPTER 1: INTRODUCTION

This research dissertation deals with the question whether sending SMS text message reminders to clients attending cognitive behaviour therapy increases their attendance rates at the cognitive behaviour therapy clinic or not. A literature review is part of the dissertation, which puts the study in context. A randomized controlled trial experiment was setup at a hospital to test the research question. Potential volunteers were also asked questions about their preferences for different methods used for appointment reminders. Thus both quantitative and qualitative data was obtained during this research, which is described in the results section.

Outpatient clinics provide valuable health care services to patients. These clinics function at different levels of care in different locations but in general, they provide a place where people seek medical opinion and treatment. An important function of an outpatient clinic is the review clinic when patients return to the clinic to update on the progress of their illness as part of the recovery process (Jibaja-Weiss, 2005). Different disciplines and specialties of health care provide outpatient clinic services and like other specialties, they play an important role in psychiatry also. Traditionally, patients who are due for a medical consultation are sent letters of appointment by post. This practice continues to this date despite the fact that numerous new technologies of communication are now available to people due to a vast expansion and improvement in information technology over the past thirty years (Reiss, 1985). Appointment letters may be lost in the post or people may forget that they have an appointment with their doctor at a certain date and time. Thus, other modes of communication have been used to inform patients of their

upcoming appointments including telephone and text messaging. A few studies have been conducted to see if these methods of communication have an advantage over the traditional means of communication with patients via letters in the post. With this in mind, a research proposal was drafted to find whether text message reminders improve attendance amongst people who are attending cognitive behaviour therapy sessions at an outpatient's clinic.

1.1: SMS text messaging

From birth of the telephone through the eruption of mobile communication equipment, technology gadgets are some of the most significant transformations of our society. Nowadays, modern technology tools are the dominant means of communication for professional interpersonal exchanges. They also occupy an important place in private communication (Trenholm and Jensen, 2003).

SMS (short messaging service) text messaging is a common and convenient way of communication and coordination (Leung, 2008) as well as an example of multitasking (Grinter and Eldrige, 2001). According to Adams, (2008), interactive messaging using modern technology takes 30% time of the people. Modern human life has become so fast that people get limited leisure time, which they try to consume wisely. Thus, many people use modern technology communication to avoid face-to-face interaction (James, Wotring and Forrest, 1995; Lee and Perry, 2007).

Despite the ubiquitous use of SMS technology in modern life, traditional methods of appointment reminders such as postal letters are still being used. The literature review of this dissertation discusses the potential uses of SMS technology in health care services.

SMS was created during the late 1980s to work with a digital technology called GSM (global system for mobile communications), which is the basis for most modern cell phones. Cell phones send and receive data with its cell phone tower over a pathway called control channel. Mobile phone services use this cell approach and every location is divided into different cells. Every so often, the cell phone and the tower exchange a packet of data so the phone can change cells as its location changes moving around. Upon receiving a phone call, the tower sends the phone a message over the control channel that tells the phone to play its Ring tone and also gives the phone a pair of voice channel frequencies to use for the call.

SMS technology works in the same manner. The text message flows through the cell phone tower to the SMS centre and to the tower of the cell where the recipient phone is located and the tower then sends the message to the phone as a little packet of data on the control channel (Hord, 2011). SMS text messages can be sent over the Internet. The hypertext transfer protocol (HTTP) is converted to the SMS protocol by an SMS gateway and then transmitted on to the cell phone network using a GMS modem.

The following flow chart explains how SMS technology works over cell phone networks and over the Internet.
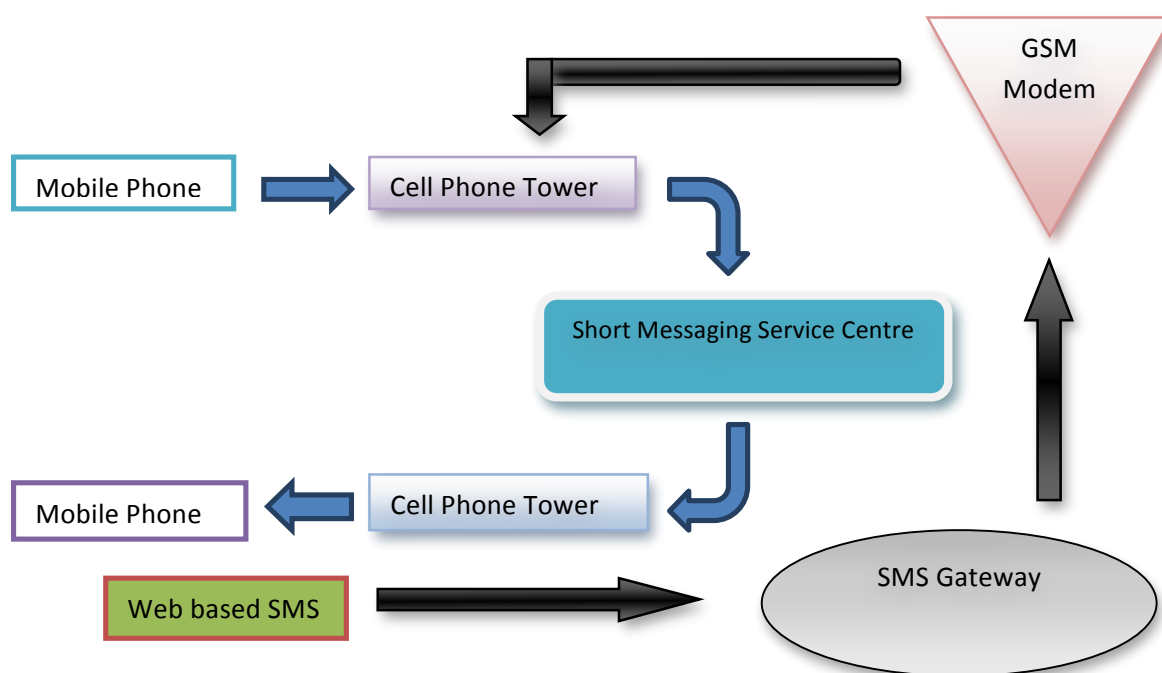
Figure 1.1: How SMS technology works

1.2: Cognitive Behavioural Therapy

Cognitive Behavioural Therapy or CBT is a psychotherapeutic approach for treating psychiatric illnesses like mood disorders for example, depression and bipolar disorder, anxiety disorders, post-traumatic stress disorder, obsessive compulsive disorder, phobias and insomnia (British Association of Cognitive and Behavioural Psychotherapies, 2005). Like other psychotherapeutic interventions, it requires the client to attend a certain number of fixed sessions with the therapist (Royal College of Psychiatrists UK, 2009). These can range from 5 to 20 weekly or fortnightly sessions, each lasting from 30 to 60 minutes each (Royal College of Psychiatrists UK, 2009). CBT theory states that our thoughts, feelings, behaviours and physical symptoms interact with each other and can

actually cause and maintain each other. This is represented in the following illustration, which is also called the Hot Cross Bun Model of CBT (Greenberger and Padesky, 1995).
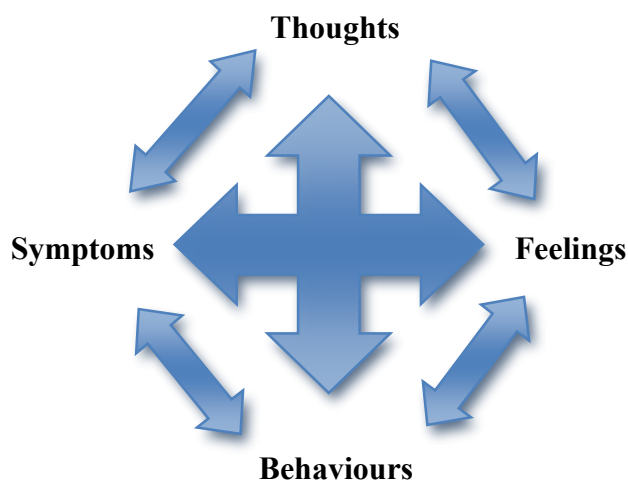
Figure 1.2: The Hot Cross Bun Model of CBT

(Greenberger and Padesky, 1995).

CBT targets the client's maladaptive thoughts, in order to replace them with better and more realistic ones, and replace unhelpful behaviours with more adaptive coping strategies (Royal College of Psychiatrists UK, 2009). The hot cross bun model of cognitive behavioural therapy as described above best explains this.

CBT has grown tremendously in popularity in the past decade and mental health services refer thousands of people for CBT every year. It is simple to understand and implement and effective within a much shorter period of time, as compared to older psychoanalytical methods of psychotherapy. CBT principles have also been used to develop computerized online treatment methods for mental health problems for example "Fear Fighter" for panic disorder and phobia treatment.

CHAPTER 2: LITERATURE REVIEW

2.1: The Short Messaging Service (SMS)

An SMS text message may contain 140 to 160 characters. SMS technology was created to allow communication of the telephone service to the user. It quickly became a common mode of communication for users of mobile phones. It can indeed be very convenient since it makes communication silent, unobtrusive and fast. Currently, SMS or "texting" is not only part and parcel of our mobile phone applications but it has also found a place in the discussion forums on the Internet, advertising, television talk shows, literature, etc. (Marlatt, 2005).

The short message service is available on mobile phones that allow sending short messages (also known as text messages, or more colloquially, texts) between mobile phones, landlines and other handheld devices. SMS was originally designed as part of standard mobile digital GSM, but is currently available in a wide variety of networks, including 3G networks. Further developments of SMS exist under the name Enhanced Message Service (EMS) and Multimedia Messaging Service (MMS).

2.2: History of short messaging service

The first version of the final standard for SMS was adopted in early 1989. The original concept proposal for a Short Message Service was by Friedhelm Hillebrand of the former Deutsche Bundespost, with contributions from Bernard Ghillebaert of the PTT (the predecessor of France Telecom) (Hillebrand, Trosby, Holley and Harris, 2010).

The first short message sent was on 3 December 1992 (with the text "Merry Christmas"); from a PC to a mobile phone in the UK Vodafone network broadcast. This was about a year after the introduction of the GSM standard for mobile phones in Europe.

At first, SMS was seen as a service to complement existing cellular telephone services. With the advent of mobile devices, small screens which can display alphanumeric information to their owners have become common and it has become much more convenient to use standard functions (such as caller ID, call forwarding and waiting and notification of incoming voicemail messages). Ability to send and read short texts on the screen of your mobile phone has been driven by a desire to use it as a means of two-way paging and allow subscribers to give up an additional device.

With improvements in network infrastructure and terminal devices, the range of applications supported by SMS expanded. It was first used as an electronic mail and fax, and various types of information services for mobile users (stock quotes, news, weather), and then for interactive services (access to bank accounts and Internet resources).

A distinctive feature of the SMS (also one of its advantages over traditional paging) is improved delivery of the message. If the recipient is temporarily unavailable (for example, he is out of the network or the phone is turned off), the system automatically determines the failed connection attempt, remembers the message and stores it until the recipient of the communication gets connected to the network (Jibaja-Weiss, 2005). SMS technology is established and widely and cheaply available to people today. By the end of 2008, there were more than four billion mobile phone subscribers worldwide. By 2011 there are 5.3 billion mobile subscribers which comprise 77% of world's population (Global Mobile Statistics, 2011) Furthermore the majority of SMS messages reach their

destination. All these aspects of SMS technology were taken in consideration at the time of development of the idea for research. The universal availability and on-going research in the field of using SMS text message reminders for improving outpatient's attendance is one of the reasons why this particular topic for research was chosen.

2.3: Possible uses of mobile phone and SMS technology in health care

SMS technology offers advantages in terms of more convenient communication between patient and physician, including transmission of life style information, diagnosis in emergencies, clinical test results and promotion of self-management for those who have been diagnosed with chronic illnesses (Mirza F, 2008). They have an advantage of being location independent so that healthcare is not confined to fixed locations such as surgeries or hospitals. Modern communication technology offers the possibility of managing non-critical care within the community, thus reducing hospital admissions while at the same time improving patient's quality of life and expenditure (Norris, 2002). In literature review of 16 randomized controlled trials, 10 studies reported significant improvement with interventions and six reported differences suggesting positive trends (Wei and Hollin, 2011). In mental health services, many psychiatrists are still unfamiliar with SMS messaging as a means of enhancing clinical practice (Neimmark, 2001).

A few studies have been done to examine the impact of SMS messaging for improving aspects of mental health care as well as their role in addictions. These studies and their results are described in the following.

Volcke, et al. (2007), conducted a non-blinded uncontrolled pilot trial to investigate the acceptability of a daily text messaging system amongst patients and psychiatrists. Patients

were sent text message reminders twice a day to remind them about their medication. The results showed that 16 out of 24 patients complied with the system and took their medications at the appropriate time with the help of the text message reminders and 16 out of 22 patients felt that the frequency of text messages was acceptable. The study was aimed at measuring patient's response to text messages, however this study had an extremely low power (depending on the number of participants of the study) with few recruits (n=27).

Donaldson, et al. (2009) did a cross sectional survey to investigate the feasibility of using text message reminders in out patient's clinics in general psychiatry and they discovered that only 53 % were agreeable to be contacted by text message. They also found that 24% patients did not own a mobile phone. This study had a small number of participants with only 50 patients surveyed.

Whitaker, et al. (2009) did a Meta-analysis of 4 randomized controlled trials in an addiction study to find if mobile phone interventions were effective at helping smokers to quit. The Meta-analysis had good power (n=2601). They reported significant increase in short-term self-reported quitting. However, there is a need to study the beneficial effects of mobile phone interventions with regards to smoking cessation in the long-term. The importance of this is perhaps best captured by the famous saying of Mark Twain "Quitting smoking is easy. I've done it a thousand times."

Depp, et al (2009), conducted a non-blinded uncontrolled pilot trial of bipolar affective disorder patients to prompt them to engage in health protective behaviours in real time. This study suffered from extremely low power (n=10). They simultaneously conducted a non-blinded uncontrolled pilot trial in patients with schizophrenia to promote self-

management of their illness as well as improving staff efficiency in allocating services. This study also had a very small number of participants (n=11). They reported a significant pre-post reduction in Montgomery Asberg Depression Rating Scale but not a significant change in Young Mania Rating Scale. The use of two standardized rating scales to measure change in studied outcomes is an important strength of this research.

Shapiro, et al. (2010) reported in a non-blinded, uncontrolled pilot trial that 87% of patients with bulimia nervosa adhered to self-monitoring of their symptoms whilst attending cognitive behavioural therapy with the help of text message reminders. Like previous studies, the research had a small number of volunteers. There were only 31 participants in the study.

Proudfoot, et al. (2010) did a cross-sectional community survey on the internet to find out attitudes of people towards the use of mobile phones for monitoring mental health and psychiatric management. 399 out of the total 525 (76%) of people who responded agreed that they would use their mobile phones for such a purpose only on the condition if the service was available free of charge. They also found that respondents who had symptoms of psychiatric illness like depression, anxiety or stress related problems were more interested in such a program as compared to those who did not have these symptoms. This study employed state of the art means of conducting research online. The participants included different people with different backgrounds from within the local community and thus it reflects the general thoughts and opinions in the public.

A non-blinded uncontrolled pilot study (Laursen, 2010) was done to assess the impact of education of young people on cannabis abuse and addiction to help them reduce their consumption of cannabis. The researchers found that the use of mobile phones in

providing information to young people helped them feel more motivated to reduce their level of cannabis abuse and to maintain reduced levels. The study had an extremely small number of participants (n=12) and did not report on long-term benefits of the use of mobile phones for education.

The usage of modern SMS technology has already been expanded and is being utilised to help manage certain ailments as well as diseases for instance asthma and diabetes (Kim and Jeong, 2007; Yoon and Kim, 2007).

2.3.1: Text messages to improve medication adherence

Other uses of mobile phone text messages that have been tested for feasibility include improvement in adherence with prescribed medication. In mental health illnesses, non-adherence to prescribed medication is a common problem and the rates for non-adherence vary widely in literature. It has been suggested that up to 80% of outpatients with schizophrenia adhere poorly with the medications that have been prescribed for them causing major problems in their aftercare (Fenton, Blyler and Heinssen, 1997; Donohoe et al., 2001; Grunebaum, Wieden and Olfson, 2001; Weiden et al., 1994). Similarly rates of non-adherence in patients suffering from bipolar affective disorder are also high. 10% to 60% of bipolar patients discontinue treatment (Lingam and Scott, 2002). Non-adherence to prescription medication has serious consequences for patients with mental health problems, such as relapse or recurrence of the illness and re-hospitalisation (Blackwell, 1976). In one study patients with chronic conditions have been reported to be less likely to adhere to prescription and treatment recommendations, than those with acute conditions (Osterberg and Blaschke, 2005).

In Denmark, a study involving asthma patients (Strandbygaard, Thomsen and Backer, 2010), showed that text message reminders to take anti-asthma medication improved adherence to treatment. The study however had a small sample size of only 26 patients who were randomised in interventional and control groups. The control group did not get any reminder and the absolute difference in mean adherence rate between the two groups was 17.8% (95% CI 3.2 to 32.3%, p=0.019) with the interventional group being more likely to adhere with medication (Strandbygaard, Thomsen and Backer, 2010).

Armstrong et al. (2009) conducted a randomised controlled study to detect adherence to sunscreen application. They divided volunteers equally into two groups. One group of participants in research received text message reminders for 6 weeks and the other half of the participants in the other group did not receive any reminders. It was found that the group of participants who did not get text message reminders had a mean daily adherence rate of 30% (95% CI 23.2% - 36.9%) compared with 56.1% (95% CI 48.1% - 64.1%, p < 0.001).

Another randomised controlled trial was done to improve malaria prophylaxis compliance in people returning from malaria endemic area. Participants in the text message group reported that reminders were very useful (Ollivier et al., 2009).

The treatment adherence studies described above are all related to non-psychiatric conditions. The beneficial results from these studies provide evidence that further research is required in the field of psychiatry to see the benefit of text message reminders in improving adherence to psychotropic medications. Only a few studies have been published examining the use of text message reminders in psychiatric and addiction settings (Volcke et al., 2007; Donaldson and Tayar, 2009; Whittaker et al., 2009; Shapiro

et al., 2010; Proudfoot et al., 2010; Laursen, 2010). Preliminary data from an on-going pilot trial to study the impact of text message reminders on community functioning of patients diagnosed with schizophrenia has found that some patients rely upon text message reminders to take their medications (Depp et al., 2010).

2.3.2: Managing side effects of medications using text messages

Medications used in psychiatric practice can be associated with many side effects. These include Parkinsonism, dystonia, cardiac arrhythmias, orthostatic hypotension, increased appetite and weight gain (Pacher and Kecskemeti, 2004; Miller et al., 2008; Gianfrancesco et al., 2003). The use of atypical antipsychotic medication such as olanzapine for schizophrenia and bipolar affective disorder is associated with increased appetite as well as weight gain and can lead to diabetes, dyslipidaemia and hypertension (Gianfrancesco et al., 2003). Text messages were used in one randomised controlled trial (Patrick et al., 2009) in San Diego, USA to help patients on antipsychotic medications to lose or maintain weight over a 4 month period. The interventional group of the research received personalized supportive text messages and they were reported to lose more weight after adjusting for sex and age than the comparison control group of the research who did not receive these messages (-1.97 kg difference, 95% CI -0.34 to -3.60 kg, p=0.02) (Patrick et al., 2009).

In a recent Meta-analysis of 22 trials to assess the effect of mobile phone intervention on blood glucose control in diabetes self-management, strong evidence has been found that mobile phone intervention leads to statistically significant improvement in blood glucose

level control and self-management in care. This has specially been reported for non-insulin dependent diabetes mellitus (Liang et al., 2011)

A systemic review of studies about mobile phone use in diabetes self-management care (Krishna and Boren, 2008) reported that 9 out of 10 studies showed significant decreases in haemoglobin A1c values in interventional groups who were provided personalized advice and support compared to control groups who were not provided such advice. Haemoglobin A1c value is an indicator of long term blood glucose control and a lower level indicate better glycaemic control. The review showed that educational intervention using mobile phones can help avoid symptoms of illness and this in turn leads to better health outcomes (Krishna and Boren, 2008).

Weaver et al. (2007) examined the use of home monitoring of patients who were receiving cancer chemotherapy. Cancer chemotherapy is associated with side effects such as nausea, vomiting, diarrhoea. The research involved real time self-assessment of side effects due to cancer chemotherapy sent to a computer via secured connection and the computer then responding with automatic feedback and advice to the patient's mobile phone via text messages. In case of moderate to severe symptoms a nurse was also informed via a pager who then contacted the patient to reinforce the automatic advice sent by the computer and assessed the patient using clinical algorithms. Patients reported feeling secure in the knowledge that their symptoms were constantly being monitored and that they were participating in their own self-care (Weaver et al., 2007).

2.3.3: Use of text messages in psychological treatment

Text messages can be used theoretically in psychological treatments for example to support cognitive behavioural therapy homework in patients suffering from depression or anxiety disorders. However, further research is essential in these patient populations before the use of text messages in these patients is used widely.

2.4: Absenteeism from hospital outpatient appointments

The nonattendance of patients from surgeries or being absent from outpatient appointments is an intractable problem. A high level of failure to attend or "did not attend" (DNA) rate not only impacts patient outcomes owing to missed opportunities for diagnosis and treatment, it also reduces the overall efficiency of the health systems which is by far quite detrimental to the entire health system of a country or state for that matter. Among the foremost reasons for outpatients' failure to attend are tendencies such as forgetfulness (8-50% in some studies such as Murdock and Rodgers, 2002; Killaspy and Banerjee, 2000) and a confusion or misunderstanding over dates and times (Murdock, 2002; Sawyer, Zalan and Bond, 2002; Neal, 2005; Zailinawati, 2006). It has also been shown that non-attendance of scheduled appointments can hamper patient treatment. (Mitchell and Selmes, 2007; Geraghty and Glynn, 2008) Up to 60% non-attendance rates in psychiatric services have been reported in some studies (Sparr and Moffitt, 1993; Pang and Tso, 1995).

Different methods of reminders have been tried and evaluated with varying degrees of success in reducing the rate of missed appointments. Interestingly though, all such efforts entailed the use of letters (Jibaja-Weiss, 2005), postcards (Thomas, 2004), automated phone calls (Maxwell, 2001) as well as personal telephone calls (Roberts, 2007). These

communication methods require intensive efforts. What we need are cost-effective interventions that are capable to reach a broad section of the population in order to reduce the overall failure to attend rates.

Non-attendance of hospital appointments affects all specialties of health care. A clinical trial at the eye clinic in a hospital in Birmingham, United Kingdom, shows a high non-participation of 12.6% (King, David, Jones and O'Brien, 1995). A New Zealand study has revealed high nonparticipation in the Public Eye Clinic of 17.2% (Koppens, Dai & Mora, 2005).

A number of recent studies have revealed that the use of SMS text messaging medium as a means to send appointment reminders is highly effective in increasing the attendance rates (Battistotti et al., 2006; Downer et al., 2006; Geraghty et al., 2007; Leong et al., 2006; Milne et al., 2006)

Absenteeism or nonappearance at hospital outpatient departments is a serious problem for healthcare systems and according to statistics; it costs the UK National Health Service (NHS) a staggering 790 million pounds each year (Mohan, 2005). Moreover, it drastically reduces the usefulness and competence of the delivery of ambulatory health care and results in sizeable financial losses to the health systems (Geraghty, Glynn, Amin and Kinsella, 2007). It also leads to sub-optimal utilisation of administrative and clinical staff, thus ensuing in more delays for other patients (Downer, Meara and Da Costa, 2005). The increased latency may delay the presentation and evaluation of patients' symptoms and might as well hinder long-term monitoring of chronic diseases, which for that matter lead to increased patient morbidity (Murray, 2000). Furthermore, there are even shoddier outcomes for nonattendance and a lack of stability of care (Karter et al, 2004).

2.5: Strengths of SMS technology for use in appointment reminders

SMS reminders for appointment have many advantages. Mobile phone messaging is a widespread method of communication. A survey conducted not so long ago has shown that over 85% of adults in the UK are using mobile phones as a means of communication. The Short Messaging Service on mobile hand held equipment is now being used as one of the most extensive processes of communication in the world with about 41.8 billion text messages sent in the UK alone in the year 2006. Practically all types of mobile phones have the ability to accept such messages.

Over and above the advantages already described above, the usage of SMS reminders require minimal investment in IT infrastructure; for the reason that they already exist - such as computer software for sending text messages as well as networks that are required for SMS communication. It is also convenient to integrate software into existing automated electronic patient medical records system and administrative databases of medical institutions and clinics (FrontlineSMS, 2009). Sending automated messages usually requires minimal or no training at all and therefore it saves time as well as being cost effective.

Internet SMS services provide a convenient system to send SMS and bulk SMS packages can also be purchased. Subscribers can schedule to send messages even while they are away from their computer and not having access to the Internet, making it very easy and reliable to use (Hays, 2006, p.110). This method was eventually used to send appointment reminder messages to the clients participating in the research.

SMS text messages are silent mode of communication and can be checked anywhere whereas phone calls may distract patients from their usual activities. It is also important to note that a lot of precious time is wasted on waiting for the recipients to receive the phone call while text messages can save time spent on phone call conversation. The installation of SMS messaging system for patients to meet or call in response to a reminder by SMS can enable them to cancel their orders to help reduce the rate of nonattendance and available dates for other patients who would otherwise be missed.

2.6: Cost efficiency analysis

Sending SMS appointment reminders in advance could result in savings for all departments of the hospital. An earlier cost earnings analysis estimated the direct annual cost of missed appointments for a hospital in England is approximately £575, 000, 000 (Atun and Mohan, 2005) and the usage of SMS based reminders could lead to potential savings of £55.6 to £83.5 million per year (Atun and Mohan, 2005). Therefore, the potential scope and economic benefit of this technology is huge.

Missed appointments lead to significant costs to health systems of many medical organizations. Costs involved in such appointments are direct costs as well as the opportunity costs of missed appointments. A survey of 683 medical practitioners in the U.K revealed that in the year 2005, approximately 4,949,517 GP appointments are missed each year while the number of missed appointments has been increasing at a rapid pace (Atun and Mohan, 2005).

As noted before, missed appointments are a problem in almost all the medical specialities including psychological and cognitive behaviour therapy appointments. Estimated cost of

a cognitive behaviour therapy appointment is £18 in the United Kingdom National Health Service (NHS) while the annual direct cost of missed appointments is about £180 million for NHS (Lieu et al., 1998). The loss of hospitals is even higher. The direct cost of missed cognitive behaviour therapy appointments is 4.5 to 6 million per year (or up to ten times), which is an estimated 575 million pounds per year (Lieu et al., 1998).

The increase in waiting times and prolonged appointments for cognitive behaviour therapy has affected the ability of practices to meet performance. Many therapists would consider striking off patients who repeatedly missed appointments from their clinic list, while many believe that the introduction of charges for missed dates could help to solve the problem of non-attendance (Mitchell and Selmes, 2007).

Some examples of the relative costs of text message reminders and phone call reminders are discussed in the following section about previous studies done with appointment reminders.

2.7: Studies to detect improvement in hospital appointment rates with reminders

Research has been conducted to see if SMS messages improve outpatient clinic attendance in different departments of health service (Downer, Meara and da Costa, 2005).

In London, a system that uses SMS for diagnosis reported positive experiences of patients and reduced number of patients who did not attend appointments (Adigun-Harris, 2004).

A study in Australia (Stott and Rubinstein, 2004) found that 22,658 patients with a mobile telephone number were sent an SMS reminder for their outpatients appointment; 20,448 (90.2%) of these patients attended their appointment. The control group included

22 452 patients with a mobile telephone number who were not sent appointment reminders, with 18,073 (80.5%) patients attending. The non-attendance rate was significantly lower in the trial group than in the historical control group (9.8% v 19.5%; P < 0.001). The cost of sending the SMS reminders was small compared with the increase in patient revenue and associated benefits generated as a result of improved attendance (Stott and Rubinstein, 2004).

A Chinese study (Chen, Fang, Chen and Dai, 2007), investigated the question whether SMS reminders were as effective as automated phone call reminders to clients. They discovered a 35% drop in nonattendance for SMS reminder recipients and a 40% drop for telephone call recipients in comparison with a control group that was not sent text or phone call reminders. This difference was statistically significant (OR 1.698 95% CI 1.224 to 2.316, p=0.001). The researchers concluded that with the small number of participants (1,848) the difference between SMS and telephone reminder results however, was not significant and could have happened by chance. The cost-effectiveness comparison of SMS and telephone calls showed SMS to be cheaper for the results obtained (Chen, Fang, Chen and Dai, 2007), but the prices quoted of 0.31 Yuan or 0.05US$ for SMS and 0.48 Yuan or 0.07US$ for telephone reminder indicates that the labour cost of the person making the telephone call was not factored in. This is because of the use of an automated call system. In any cost effectiveness analysis labour cost for the method used for reminding clients must also be considered.

A study in Australia (Stott and Rubinstein, 2008), reviewed whether an SMS reminder would improve non-attendance rates among marginalized young people in urban areas. The researchers found that these clients were more likely to attend, reschedule or cancel

their appointment after receiving an SMS reminder than if they did not. The survey thus concluded that SMS appointment reminders reduced the non-attendance rate, which is greater for 'at risk' young people (Stott and Rubinstein, 2008).

In a study (Koshy, 2008), automated SMS reminders had been scheduled, so they are not received at inopportune moments, like at night. Participation / non-participation status for patients who had not received an SMS appointment reminder was set up by the software. All the information regarding cancellations of patients' appointments via SMS as well as the control group was also gathered. The results of the study showed a decrease in non-attendance percentage rates of patients who were in the interventional arm of the study receiving text message reminders was lesser (11.2%) than compared to the ones in the control arm of the study who did not receive any text message or alternative reminder (18.1%). The study also found that there was a 38% difference in the attendance rates of those who received text message reminders compared to those who did not.

In a randomised controlled trial, Leong et al. (2006) found that text message reminders significantly increases attendance rates in primary care settings (OR 1.59, 95% CI 1.17 to 2.17, p = 0.005). The study was conducted in Malaysia and had 993 volunteers participating in the research (n=993). An interesting finding of this research was that when a comparison of attendance rates was done between people that were sent text message reminders with the group that was reminded using mobile phone calls, there was no significant difference in the attendance rates. In their research they also noted that the cost of text messaging reminder per attendance (0.45 Malaysian Ringgit which is approximately equal to 0.15US$) was lower than a mobile phone reminder (0.82 Malaysian Ringgit which is approximately equal to 0.27US$) (Leong et al., 2006).

In Ireland, a study to assess the impact of text message reminders on non-attendance to an ENT outpatient's clinic revealed that appointment reminders increased attendance rates following the use of text message reminders. The non-attendance at the clinic was reported to have reduced from 33.6% to 22% (Geraghty, Glynn, Amin and Kinsella, 2008).

Results of a recent randomised controlled trial to detect the usefulness of text message reminders in chronic physical and/or mental health illness follow-up in primary care clinics in Malaysia also showed that text message reminders improve attendance of clinical appointments (Liew et al., 2009). The success of this trial lied in the fact that recruited a good number of participants for the experiment (n=931) and they continued the reminder experiment for 6 months.

Several other methods of reminding the patients regarding their appointments have also been studied such as regular mail and phone calls and which have a reduction of nonparticipation rate of between 6% and 19% (Hashim, Franks and Fiscella, 2001). These studies show that reminders of any type would make some difference upon the outpatient attendance rates. There is however a need to compare different reminder methods to detect which type of reminder gets the best attendance rate results but at the same time, the method of appointment reminder should also be cost effective and easy to use.

2.8: Comparison of phone call and SMS text message reminders

SMS text message reminders for appointments are a form of communication. For a greater understanding of its true impact and benefit, a comparison with other modes of communication used for the same purpose, is required. For this reason a recent study

carried out by University of Washington Paediatric Dental Department, Seattle, USA (Nelson et al., 2011) with the SMS system installed in the hospital to detect the impact of SMS reminders in comparison with the impact of phone call reminders, is analysed here as an example. This can help in setting up the design for this research also.

This was a randomised controlled trial, which included an initial preparation stage of planning the survey and optimizing the number of the participants. In this step, the scope of the research and its limitations were clarified. It also included an estimation of the number of resources that were needed for each project activities.

The second step of the research dealt with assessing the subjects for their eligibility to participate in the study. This is an important limiting factor of any research because every research study has well defined eligibility criteria for volunteers who can participate in the study. Not all patients attending a health service would fit in the eligibility criteria of a research allowing them to participate. These criteria can include different variables like age, medical diagnosis, different treatment groups etc. Perhaps most importantly, even when someone can be a potential volunteer for a research study by fulfilling all the criteria, they may still choose not to participate as volunteers. The study researchers invited 543 parents or caregivers of children to participate in this study. The received a 59% response to their request for volunteer participation in the study and 318 parents agreed to participate. Recruitment of participants is an important aspect of any research and must be conducted sensibly. It is essential to talk or interview the client prior to enrolment so that the client's consent and commitment can be obtained. In such projects clients often refuse to give their personal information and other history so recruitment of volunteers can be a difficult and limiting step of research.

After enrolment of volunteers, the researchers randomly allocated them into control and interventional arms of the study.

A randomly selected group of parents were made the control arm in the study. The control group had a total of 160 parents and they were sent voice message as an appointment reminder at least 48 hours before their children's appointment with the consultants. The other randomly selected group of parents formed the interventional arm of the study in which a total of 158 parents were included. They were sent SMS text message reminders as appointment reminders at least 48 hours before their children's appointment with the consultants.

Both arms were analysed as the study progressed. The impact of these reminders on the attendance was assessed and predictions were made on the basis of graphs and statistics. These predictions were then compared with the results obtained from the actual study. The methodology of the whole research is well captured in the following flow chart adapted from the publication of the authors (Nelson et al., 2011).
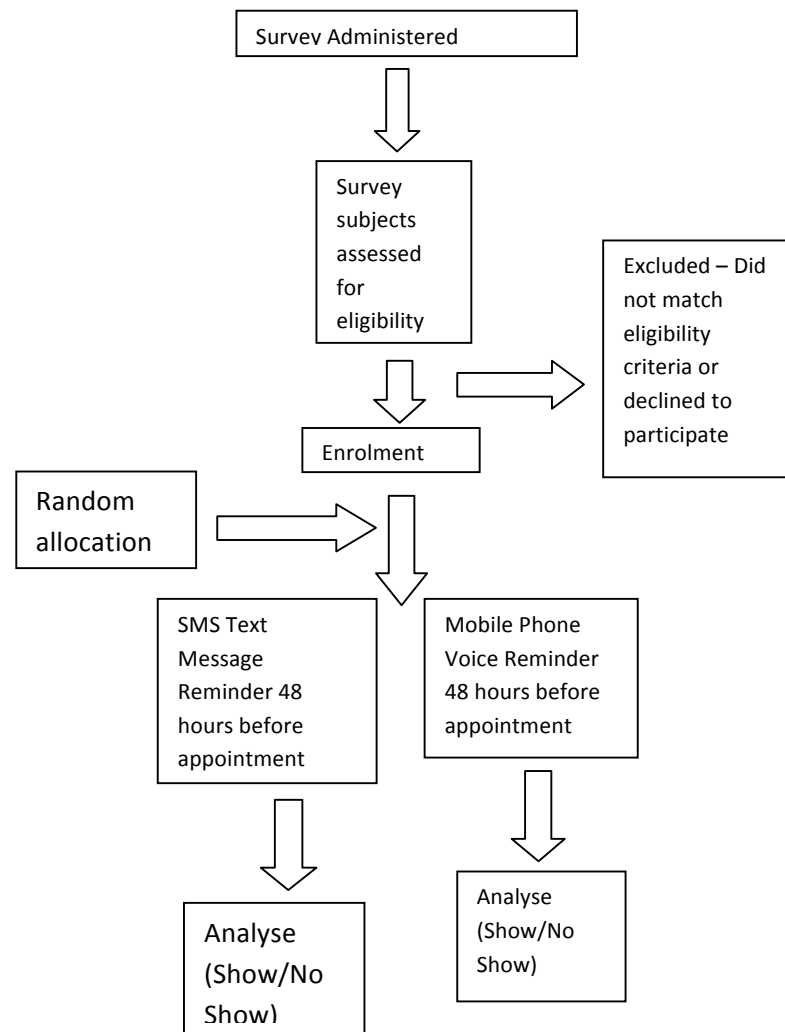
Figure 2.1: Methodology of the research (adapted from Nelson et al., 2011)

2.8.1: Results

The overall results of the study were different from the predictions that were made before beginning the research. The hypothesis and initial prediction was that the interventional group that were sent text message reminders will show better appointment rates than the control arm group that was reminded of their appointments using phone calls but the study results obtained were entirely inverted. The researchers found that younger parents

below the age of 40 years were more likely than older caregivers (p=0.02). The control group of parents who received voice message appointment reminders had a better attendance rate (17.7%) as compared to the interventional group of parents who were sent SMS text message reminders (8.2%) (p=0.01). This equals 146 attendees out of the sample 160 in the control arm with only 13 not being able to attend the appointment at the outpatient clinic while in the interventional arm of the study parents and caregivers who were sent text messages as reminders, 130 attended the appointment while 28 did not attend out of the total number of 158. These results are shown in the following graphs. For ease of graphical representation, 160 participants for both interventional and control arms of the study have been shown.

Figure 2.2: (Attendance Rates). y axis = number of clients
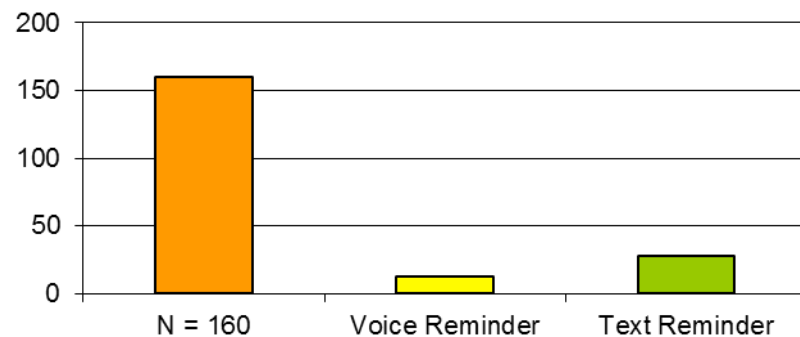
Figure 2.3: (Non Attendance Rates). y axis = number of clients

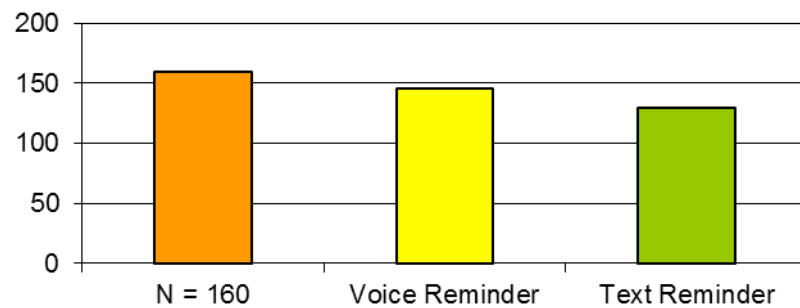Looking at the results of the study, the researchers concluded that SMS text messages were actually not as effective as voice reminders for patients in a paediatric dental clinic. They proposed that future studies should investigate the advantage of text message reminders limited to those patients who select this type of reminder from available options as well as population settings outside their university (Nelson et al., 2011).

2.9: Cognitive Behavioural Therapy (CBT)

Cognitive behavioural therapy (CBT) is a form of "talking therapy" for different mental health disorders (phobias, addictions, psychosis, depression, anxiety etc.) which aims to address the special difficulties of the patient in the "here and now " through practical exercises focused on observable symptoms, through behaviour and coaching by the therapist who seeks to intervene on mental processes also known as cognitive processes, which are considered to be the origin of emotions and their disorders. Standardizing the practice of CBT has contributed to the recognition of its effectiveness due to its reproducibility, which is a requirement of any scientific process (British Association for Behavioural and Cognitive Psychotherapies, 2008). Indeed there is empirical evidence that CBT is effective for treatment of different mental health problems including mood disorders, anxiety disorders, eating disorders, substance abuse, personality disorders and even psychotic illnesses (Butler, Chapman and Forman, 2006).

Some details of CBT are discussed in this literature review, as it is important to understand the various aspects of this form of therapy, as this research is limited to patients undergoing CBT at a clinic. An understanding of how CBT works can provide

insight into certain limitations of this research project as shall be discussed later in the literature review as well as the discussion on results.

Cognitive behavioural therapy is essentially a combination of two different psychological approaches for treatment of people suffering from mental health problems i.e. a combination of two different types of therapy. These are cognitive therapy and behavioural therapy.

Cognitive therapy, as an application of cognitive psychology, maintains a focus on the psychological conception of mental processes (such as reasoning, memory and attention) and from an intra-psychic point of view (understanding that there is something comparable in the mind of some people with others). Behaviour therapy, however, focuses on their conduct (understood as an act of setting interdependent actions with the environment and not just a motor response). For this reason, behaviour therapy does not fit with intra psychic interpretations of cognitive therapy, and in this model only the environment determines behaviour.

Cognitive behavioural therapy is based on a model that emphasizes the interrelatedness of behaviour, cognition, emotion and contextual factors. Basic to the cognitive behavioural model is the notion that cognition (e.g. attitudes, expectancies, attributions, self-talk, beliefs, schemata) is central to understanding and hence producing change in effect and behaviour. The CBT model recognizes the importance of learning, the influence of contingencies and models in the individual's environment, and the role of the individual's social and interpersonal context in the development and improvement of psychological difficulties.

Cognitive behavioural interventions are typically short term, and make use of structured behavioural tasks as well as cognitive interventions to effect change, and cognitive behavioural therapists work together with their clients during regular appointments, to evaluate problems and generate solutions. By monitoring and correcting unrealistic thoughts, the individual is able to develop a more accurate rational cognitive set and that helps the individual to modify affect and behaviour. After examining the influence of behavioural factors on the individual's psychological difficulties, the therapist and client utilize specific behavioural techniques to effect change (Koshy, 2008). Behavioural interventions may include structured reward programmes, relaxation, problem solving, exposure tasks and the scheduling of pleasant events. The techniques that are used may vary depending on the client's specific psychological difficulty. For example, the therapist may schedule pleasant events for a client with depressed mood, or gradually expose a client experiencing excessive anxiety to particular tasks. In fact, cognitive interventions often have behavioural consequences and vice versa, as mentioned by prestigious authors of both cognitive and behavioural approaches, so the main difference between the two schools lies in the theoretical conception of the mind, although they may perform similar actions e.g. Albert Bandura "Social Learning Theory" or Aaron T. Beck "Cognitive Therapy".

CBT is a major force in psychotherapy today, both in theory and in application. A number of cognitive behavioural therapies have shown beneficial results in randomized clinical trials, and manuals now provide therapists with clear direction regarding the content of the treatments. Well established procedures include cognitive behavioural therapy of depression, anxiety, bulimia, obsessive compulsive disorder, irritable bowel

syndrome, post-traumatic stress disorder, marital distress and pain associated with rheumatic disease.

2.10: History of CBT

Medieval physicians were aware of mental health disorders. They even developed methods to treat "diseases of the mind", (Paladin, 1998). Ahmed ibn Sahl al-Balkhi (850-934 C.E) discussed disorders related to both body and mind (Deuraseh and Abu Talib, 2005). He noted "if nafs (psyche) gets sick, the body may also find no joy in life and may eventually develop a physical illness" (Deuraseh and Abu Talib, 2005). He also noted that nafs-related symptoms included anger, anxiety and sadness, which were due to the imbalance of the soul (Deuraseh and Abu Talib, 2005). Interestingly, he was aware that the body and mind (behaviour and cognition) interacted with each other and both had effects on one another (Deuraseh and Abu Talib, 2005). He recognized two types of sadness or depression. One caused by known reasons such as loss or failure, which he believed, can be treated by psychological methods and the other caused by unknown reasons caused by physiological reasons which could be treated through physical medicine (Deuraseh and Abu Talib, 2005).

In recent history of clinical psychology, the behavioural (focusing first to change and intervene on the behaviour) and cognitive (seeking to intervene on the psyche) appeared together in the middle of the twentieth century, sometimes in competition with each other versus the psychoanalytic approach that focuses on internal processes in unconscious seeking experienced elders. Since the 1980s, this historic divide between behaviourism and cognitive tends to disappear in medical practice.

2.11: Methods of CBT

Some details of CBT in management of a few mental health conditions are given here in order to understand key aspects of this form of therapy.

2.11.1: Depression

Cognitive behavioural therapy of depression is structured, active and typically time-limited (12 to 16 weekly sessions) (Royal College of Psychiatrists, 2009). Learning experiences are designed to teach clients to monitor their thinking, to examine the evidence for and against their distorted and negative thinking, to substitute more realistic interpretations, and to begin to alter the dysfunctional beliefs and lifestyle associated with their pattern of thinking. Behavioural strategies such as self-monitoring of mood, the scheduling of pleasant activities, graduated task assignments and role-playing exercises are integrated with more cognitive procedures designed, to question and challenge their thoughts (Royal College of Psychiatrists, 2009).

2.11.2: Stress inoculation training

This is a three-stage intervention that focuses on teaching cognitive and behavioural skills for coping with stressful situations. In the first, educational, phase, clients are taught a conceptual framework for understanding stress in cognitive terms. The second phase, skills training, teaches clients cognitive (imagery, changing irrational self-talk) and behavioural (relaxation, breathing) skills. In the final stage, clients practise the new skills in stressful situations (Weiss, 2005).

2.11.3: Bulimia Nervosa

Cognitive behavioural treatment for bulimia nervosa consists of three stages of semi-structured, problem-oriented therapy. The first stage of the intervention informs the individual of the cognitive model of bulimia and explains the consequences of binge-eating, self-induced vomiting and purgative misuse. Clients are provided with alternative coping behaviours such as a pattern of regular eating. The second stage focuses on cognitive strategies to modify cognitive distortions regarding body shape, weight and eating. The final stage is designed to prevent relapse (Royal College of Psychiatrists, 2009).

2.11.4: Anxiety in children

Cognitive behavioural therapy for children teaches the child to identify anxious reactions and to employ a number of coping skills such as relaxation strategies, cognitive restructuring behavioural modification and problem solving. The programme provides clients with controlled exposure to situations that had caused them distress, and gives them opportunities to practise coping. Parental involvement in this therapy such as contingency management and parental anxiety treatment has also shown to be beneficial (Murdock, 2002).

The common thread in all these treatments is the focus on cognitive change and performance based procedures. At this stage, the mechanisms by which positive outcomes in CBT are achieved remain unclear although some evidence indicates that behavioural techniques with or without cognitive restructuring produce changes in negative thinking and outcomes (Weiss, 2005). Client factors (e.g. expectancies for

change), relationship factors (e.g. therapist–client alliance) and treatment strategies (e.g. degree of focus on cognitive processing; flexibility in implementation and behavioural modification) are being investigated in order to gain a better understanding of the process of successful psychological change (Koshy, 2008).

2.12: Predicted problems in the study

Patients may not make good use of SMS reminders if there is an error in data entry e.g. about the timing of an appointment. However, this problem may also arise with other methods of appointment reminders such as letters and phone calls (Hashim, Franks and Fiscella, 2001). In another context, the elderly have shown lower usage of mobile phones and may not be able to use the SMS reminder facilities. The Office for National Statistics in United Kingdom (2003) found that mobile ownership varied by age, with nearly 90% of 15-24 year olds owning one mobile phone and less than a quarter of the age aged 60 and over owning one. This use of mobile phones by people above the age of 60 years however, has been steadily increasing and by 2010, 89% of people above the age of 60 reported using mobile phones (Central Survey Unit, 2010). More interestingly, it is generally younger patients who miss their appointments as outpatients (WebMD, 2010), which shows that elderly patients are more responsible and usually do not forget their appointments. Thus, the use of SMS reminders may be more effective for younger patients.

Patients may change their mobile phone numbers during an on-going study (Downer S, 2005) and this gives rise to the need that contact information should be regularly updated and kept current in patient's record files (Da Costa, 2010). Furthermore it is still not clear

how text messaging impacts upon the therapeutic relationship between psychiatrists and their patients (Agyapong, Farren and McLoughlin, 2011).

Due to the limitation of the SMS messaging communication medium, there is a high risk of misunderstanding and confusion. For these reasons, standard text messages that clearly provide the necessary information relevant to the study have been used in this research. This is further described in the methodology section of this dissertation.

Both men and women have different styles of interpersonal communication. Women's relationships are more stable than men and they believe in personal and emotional communication (Hirschi, 1969) while men, in comparison, usually prefer task oriented talks and networks (Walker, 1994). Thus gender differences can be an important variable which can have an impact on results of any research studying the impact of different types of communication. In fact being male is identified as a risk factor for nonattendance in psychiatric outpatient's clinic (Rajasuriyat, de Silva and Hanwella, 2010).

Other risk factors for nonattendance in psychiatric outpatients that have been identified include not being prescribed medicines and having a diagnosis of psychoactive substance use or dementia (Rajasuriyat, de Silva and Hanwella, 2010).

This research specifically deals with the patients who are attending CBT sessions. Therefore, it is important to predict how these patients will behave towards the study proposal and what will be the responses that will be obtained from them.

Many clients who are going through cognitive behaviour therapy may be suffering from short-term memory problems due to their illness such as depressive or anxiety disorders. Psychiatric conditions such as depression and anxiety disorders are well known causes of disturbances in cognitive and memory function. In this case, a bulk of reminder can be

sent to them in order to improve their overall attendance. Therefore, it can be recommended to send them at least two messages before their appointment. The benefits of these additional texts will be revealed by the improvement in the attendance of individual client in practice (Yoon, 2007).

Age group can be a major factor affecting the overall results of any research. A study on SMS reminders in dental outpatients gave results which were more or less depended upon the age group rather than the patients of different dental diseases (Henggeler, 2008). The results showed that the 90% of patients having age of more than 41 years had responded to the messages sent to them while as the age group decreases the percentages of responses also decreases to an extent that only 70% people responded to the messages sent to them in the age group between 16-20 years. This seems to indicate that text messages may not have any advantage in improving outpatient attendance rates in younger patients.

2.13: Resistance in psychotherapy

Reasons for non-participation in research by clients attending CBT will be discussed in detail as this has been affecting this research since the very beginning. Further details of the observed reasons for potential client's non participation in this research are discussed in the chapter on results. Resistance in all forms of psychotherapy is a well-known phenomenon and can be defined as "Any client behaviour that exhibits a reluctance, on the part of the client, to participate in the tasks of therapy as set forward by the therapist," "…any behaviour that indicates covert or overt opposition to the therapist, the counselling process, or the therapist's agenda," (Bischoff and Tracey, 1995, p.488). In his

ground breaking work on resistance in patients attending psychotherapy, Otani (1989) noted that resistance can occur as a result of a "…negative interpersonal dynamic between the therapist and the client" (Otani, 1989, p.459). Another definition of resistance is that it is the "psychological forces aroused in the client that restrain acceptance of influence (acceptance of the counsellor's suggestion) and are generated by the way the suggestion is stated and by the characteristics of the counsellor stating it" (Strong and Matross, 1973, p.26). Clients attending CBT can be reluctant to share their information and to participate in research despite the fact that all efforts have been made to idealise the circumstances for them for participation as volunteers by providing information about the research, explaining methods used for confidentiality etc. Some of these reasons are discussed in the following.

2.14: Why CBT clients may be reluctant to participate in research?

The reason why CBT clients may be reluctant to participate in research needs further exploration and research. A cross sectional survey could provide an insight into the issue of non-participation by clients attending CBT in research. Many factors need to be taken into account in this matter which can include age, gender, diagnosis, location, social background, past history of mental or physical health problems etc. It has been noted that most people who agree to participate in research, hope that the research will produce information and knowledge about their disease and thus they can benefit themselves with research participation (Psych Central, 2006). Furthermore, research may offer a degree of care that patients may not get otherwise (Psych Central, 2006). The observed reasons

for client's refusing to participate in this research are elaborated further in the chapter on results.

Some arguments are presented here for explaining why patients attending CBT for mental health problems can be reluctant to participate in research. As already noted, these arguments require testing with research.

1. Stigma.

2. Personality of clients.

3. Family enmeshment.

4. Inability of researcher to gain rapport with clients.

5. Memory problems.

6. Lack of motivation.

2.15: Details of possible reasons for client's refusing to participate in research

2.15.1: Stigma

Despite growing awareness of mental health problems in modern society in Europe and America, there remains a deep fear or stigma associated with mental health disorders.

"It was difficult to make the decision to be public about having a severe psychiatric illness, but privacy and reticence can kill. The problem with mental illness is that so many who have it, especially those in a position to change public attitudes, such as doctors, lawyers, politicians, and military officers are reluctant to risk talking about mental illness, or seeking help for it. They are understandably frightened about professional and personal reprisals". (Jamison KR, 2003)

The above comment is from Kay Redfield Jamison who is a professor of psychiatry and she has suffered from bipolar disorder throughout her life. Stigma and discrimination is well-documented social problem that specially affects people suffering from mental health problems and it impacts on everyone. One in four of us will personally experience mental illness (Mental Health Foundation, 1999). Thus, many of us deal with mental illness at some time in our lives, whether in family members, work colleagues or ourselves. Stigma has serious consequences for a patient like rejection in society and thus the distress that people with mental health problems face in their lives is magnified (Gray, 2002).

The concept of stigma can be understood from the very definition of the word. Stigma originally referred to a mark or brand on Greek slaves, which clearly separated them from free men (Gray, 2002). Stigma has been explained as a social and interactive process (Goffman, 1963). Scrambler (1998), during his work on patients with epilepsy described the concept of stigma by dividing it into two types. This explanation of stigma shall be the standard description of the concept for the purpose of this dissertation.

2.15.1.1: Felt stigma: This refers to a patient's shame and an expectation of discrimination due to their illness that can prevent them from talking about their experiences and also prevents them from seeking help. This is also called self-stigmatisation or internal stigma (Gray, 2002).

2.15.1.2: Enacted stigma: This refers to the actual experience of unfair treatment by patients. It is also called external stigma or simply discrimination.

Both types of stigma can lead to social withdrawal and reduction of social supports (Gray, 2002).

The problem associated with stigma can be encountered during any research dealing with medical problems and especially with mental health illnesses. Patients may have several misconceptions in their minds about issues related to the research that deal with privacy and confidentiality. If the researcher is unable to convince clients that their details shall only be known to people conducting the research on a "need to know" basis, they may choose not to participate.

2.15.2: Personality of clients

Participating in research may result in increased social interaction which clients may not desire. Clients with mental health problems can have a learning disability, borderline, anxious or anti-social personality traits or diagnosis which may hinder their full participation in social activities including participation as a volunteer in research. Many mental health problems are known to result in social withdrawal.

2.15.3: Inability of the researcher to develop rapport or ethical trust

Development of rapport is extremely important in any doctor-patient relationship and particularly so in mental health services (Leach, 2005). It has been noted that the importance of therapeutic relationship between a patient and therapist is often neglected in current literature (Leach, 2005). A strong therapeutic relationship can have a positive impact on patient satisfaction, treatment concordance and health outcomes (Leach, 2005). If the therapist is unable to establish a good rapport with a client, he will encounter greater resistance from the client (an NLP presupposition). It can thus be similarly argued that lack of rapport with potential volunteers will result in lesser number of

recruits in the study. Also a negative past experience of the health services can lead to resistance to participate in a side research that does not have anything to do directly with the client's management and therapy.

2.15.4: Family enmeshment

"Enmeshment refers to an extreme form of proximity and intensity in family interactions...In a highly enmeshed, overinvolved family, changes within one family member or in the relationship between two family members reverberate throughout the system... On an individual level, interpersonal differentiation in an enmeshed system is poor...in enmeshed families the individual gets lost in the system. The boundaries that define individual autonomy are so weak that functioning in individually differentiated ways is radically handicapped (Minuchin, et al, 1978, p.30)."

As seen by the explanation of family enmeshment above, patients with mental health problems and enmeshed families may not be freely able to decide for themselves if they want to participate in research as volunteers or not.

2.15.5: Memory problems

Forgetting things with poor attention and concentration as well as memory problems can be due to mental health conditions (Henggeler, 2008). Memory problems are not common in every client undergoing CBT but must be kept in mind during such research. Due to memory difficulties, client may not remember their role as volunteers in an on-going study.

2.15.6: Lack of motivation for therapy:

This can be a huge problem for a lot of clients undergoing CBT. Apathy and lack of motivation is an important symptom of mental health illnesses such as depression (Reekum, et al., 2005). This issue of apathy is hotly debated and a famous neuropsychiatrist named Dr Robert Marin has argued that depressed people feel emotional pain so they cannot suffer from a condition that is characterized by a lack of emotion (Marin, 1991). This has further been supported by Levy (1998) who wrote discussed this issue in an article titled "Apathy is not Depression". However a poster presentation at the 2000 annual meeting of American Psychiatric Association on this very subject showed that out of 126 depressed or bipolar patients attending psychiatric outpatient's clinics, 79% met Dr Robert Marin's own criteria for apathy (Marton, et al., 2000). Furthermore, CBT involves repeated questioning of thought patterns and this can be difficult for clients and thus they may deliberately refrain from participating in any research that aims to improve their attendance at a clinic (Wheeler, et al., 1983, p.943).

2.16: Tackling resistance in clients

Awareness of resistance in psychological treatments would benefit a researcher who has to deal with clients undergoing psychological treatment. Different strategies can be employed to overcome resistance in clients undergoing psychotherapy (Mitchell, 2005). These are discussed here with the view that same principles and strategies can be used to enhance recruitment in research. Some of these strategies are the following.

2.16.1: Informing the client about the resistances

The clients should be made aware of the different kinds of resistances and why he may be reluctant to participate in the process of therapy and change (Koshy, 2008). The resistance of clients should be treated with respect (Mitchell, 2005).

2.16.2: Evaluating the exact reason of resistance

Evaluation of the exact reason for resistance must be provided to understand the correct and true perception in both the minds of the therapist and the client. Unless and until the therapist is able to find the exact reason for resistance in the client's behaviour, psychotherapy may not have the desired impact on the client (Wheeler et al 1983, 943).

2.16.3: Conversation in the language that reflects the client's personality

Conversation with client and the language used in therapy has to do with building good rapport with clients. Clients can experience therapy sessions in a better way when the therapist is able to understand the personality of the client and is able to speak a language that reflects this understanding. Also mutually agreed upon goals should be set up during therapy (Mitchell, 2005).

2.17: Methods to increase recruitment in research

Different methods have been used in research to enhance recruitment of volunteers. These include offering payments, reimbursement and incentives to patients to encourage participation in research (Draper, Wilson, Fanagan and Ives, 2009).

CHAPTER 3: METHODOLOGY

This section provides the details of the methodology that was used to study whether SMS text message reminders improve attendance rates at CBT clinic. The research procedures will be explained in detail here.

3.1: The research question

Research designs are based on three categories of the research question. These three types of research questions are explained below.

1. A descriptive research question aims to describe some phenomenon e.g. what is the ethnic breakdown of immigrants working in the health service of Ireland?

2. A differences research question asks if there is some sort of difference in two or more groups regarding some phenomenon e.g. does a new experimental antibiotic works better for treating a particular infection than an older antidepressant.

3. A relationship question asks if two or more occurrences are related in a systematic manner e.g. does regular exercise increases high-density lipoproteins?

Since this research involves two experimental groups and one control group testing the research question "do SMS text message reminders improve attendance rates of CBT appointments?" thus it belongs to the differences research question category.

3.1.1: Null Hypothesis

Scientific research requires the formulation and testing of hypothesis. Null hypothesis states that there is no statistical difference between two or more observations or

measurements. For the purpose of our research, the null hypothesis is that there is no significant difference between the CBT clinic attendance rates of those who are sent SMS text message reminders compared to those who are not sent any reminders.

3.1.2: Alternative Hypothesis

The alternative hypothesis states that SMS text message reminders sent to clients attending CBT improves their appointment attendance rates in comparison to those who clients who are not sent any reminders.

3.2: Randomized Controlled Trial

This study has one control and two interventional arms. A randomized control trial was selected for this study because there are very few randomized controlled trials in the literature at present exploring the role of SMS text messaging in improving attendance rates at outpatient's appointments and specifically in cognitive behavioural therapy clinics. Randomized controlled trials are described briefly in the following.

3.2.1: Four phases of a randomized controlled trial

Phase 1

This phase of the research deals with a careful evaluation of potential participants that are needed for research and those who are eligible are selected.

Phase 2

Volunteers are allocated in the second phase in the control and experimental arms of the research. This is done in a random manner e.g. when a new medication is being tested,

participants of the study are randomly placed in the experimental and control arms of the study. Randomisation is done for eliminating bias and confounding.

Control Arm of the study

The control arm set up with volunteers that were not sent any reminders before their CBT appointments at all.

Intervention Arm 1 of the study

A series of clients in the group randomly selected were sent SMS reminders at least 12 hours prior to the appointment with the therapist for CBT.

Intervention Arm 2 of the study

The second intervention arm is the randomly selected group of clients who are sent SMS reminders at least 12 hours prior to the appointment as well as on the morning of the appointment for CBT at 0800 hours.

Phase 3

In this phase the actual experiment takes place. In this research this means the sending of SMS text message reminders about CBT appointments to clients in the experimental arm of the study.

Phase 4

This is the follow up stage of the randomized controlled trial. In this phase the participants of the study are reviewed after the experiment has been completed and finished e.g. to seek uncommon side effects in research on medications.

3.3: Research Methodology Steps

The following steps were planned to complete the research study.

1. Ethics approval

2. Recruiting volunteers for the study

3. Randomizing volunteers into three arms of the study

4. Setting up secure Web SMS account

5. Adopting a standard SMS text message for use in CBT appointment reminder

6. Trial testing the Web SMS application

7. Purchasing bulk SMS text messages from the SMS web service provider

8. Uploading contact details of volunteers and Scheduling SMS time table

9. Collecting attendance records and Statistical analysis of results

3.3.1: Ethics approval

Ethics approval was sought to conduct research at Saint Patrick's University Hospital, Dublin. The hospital has an ethics committee, which considers all proposals for research. The research proposal, an informed consent form, information leaflet and a research protocol document along with the ethics approval form were presented to the ethics approval committee. There were some suggestions made to make some changes to the application for ethics approval upon initial submission of the documents and on resubmission, the application was accepted for deliberation by the ethics committee. The ethics committee gave its full approval for the research study after considering the application. The documentation including the ethics approval form and research protocol can be found in the appendix section at the end of the dissertation.

Trinity College ethics committee gave its full approval for the study considering external approval for research by Saint Patrick's University Hospital had been granted.

3.3.2: Recruiting volunteers for the study

The volunteers for this research were to be chosen from patients attending CBT at the Saint Patrick's University Hospital, Dublin. The CBT department at Saint Patrick's Hospital, Dublin, was contacted and all therapists in the CBT department were informed of the study in detail at a CBT department's meeting. The department was made aware of ethics committee approval of the study proposal. It was agreed with the CBT department that clients who are using the CBT services at the hospital should be provided with the information leaflet about the study as well as the informed consent form for their consideration by their individual therapists. Each client was given a five days' time period to decide if they wanted to participate in the study or not. The clients who agreed to participate in the study as volunteers signed the consent form sheet along with their mobile numbers and handed over the informed consent forms to the CBT department's secretary who forwarded them to the researcher. The secretary also forwarded the information about the days of the week on which the client was attending CBT sessions. This is an important requirement as the text messages were to be scheduled on particular days and time depending on the date and time of the appointment of the client in the CBT department. It was explained to the volunteers in detail that participation was completely at the discretion of the clients and there were no repercussions of refusing to participate in the study.

3.3.3: Inclusion and exclusion criteria

All inpatients at the hospital and clients attending outpatient's department of the CBT department above the age of 18 were considered as potential volunteers except those who were attending one of the outpatient's clinic, due to the fact that all clients attending that particular clinic are reminded about their appointments a day in advance by use of phone calls (Dean Clinic). Inclusion criteria further included literacy in English and capacity to give consent. The most important inclusion criterion was the patient possessing a personal mobile phone. This was automatically ensured when volunteers were asked to provide their personal mobile phone number for the purpose of the research study. Exclusion criteria included clients below the age of 18 years and non-English speaking. Initially it was thought that enough volunteers would agree to participate in the study however very few people actually participated in the study. Volunteer number increased towards the end of the study and the reasons for that is discussed in detail in the results section.

3.3.4: Randomizing volunteers in three arms of the study

As soon as the informed consent forms were received along with the contact details of the clients, the volunteers were randomized and placed into three different arms of the study. Volunteers in the first interventional arm of the research were to be sent a text message reminder a day prior to their appointment day more than 24 hours before the actual appointment. The second experimental arm volunteers were to be sent text messages on the day before the appointment 24 hours before the appointment as well as on the morning of the day of the actual appointment at 0800 hours. The third arm was the control arm of the study and the study participants in this arm were not sent any text

message reminders. The second experimental group was to be formed to answer another aspect of the planned research which was whether clients who receive text message reminders twice show a better attendance record than those who are sent reminders only once and those who are not sent any reminder at all.

Randomization is an important part of a random controlled trial study. It is undertaken to reduce bias and helps in blinding. This study used Permuted block randomization (randomization with an allocation ratio), with an initial plan to recruit at least 10 volunteers in each arm of the study (two interventional and one control arm) and they were to be assigned using a 1:1:1 method. Volunteers were to be randomly assigned to the first, second or third arms of the study as they were recruited.

3.3.5: Setting up a secure Web SMS account

There are different SMS services available on the Internet. A search was conducted on the Internet to find a service that met the following criteria.

1.   Secure data transmission

2.   Confidentiality of users of the service

3.   Ease of use of the interface for messaging

The results of the Internet search provided different services and it was decided to use the services of the website called Esendex (www.esendex.ie).
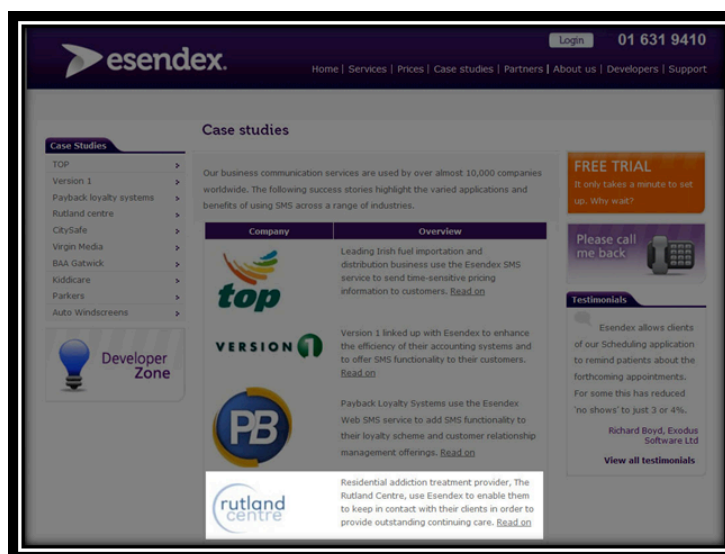
Figure 3.1 Esendex: Secure and Confidential

(www.esendex.ie).

Esendex SMS website fulfilled all three criteria of data security, confidentiality and ease of use. The website is a dedicated and secure short messaging service that fully operates on the Internet. It is completely confidential and provides services to different businesses and private companies like Aviva, which require security of data as well as health care services e.g., Rutland Centre that requires confidentiality. The security and confidentiality aspects were confirmed verbally with the Esendex customer services as well as in writing via e-mail. The customer services of Esendex website provided the researcher with information about their security and confidentiality policies.

3.3.6: Adoption of a standard SMS text message for use in the research

The following messages were the standard messages adopted for use in the text message reminders sent to the volunteers in the two experimental arms of the study.

"Hello. This is a reminder for your CBT appointment tomorrow" and

"Hello. This is a reminder for your CBT appointment today"

These standard text messages were adopted for the study as they impart a clear and single piece of information that is necessary for appointment reminder. It can be easily understood and does not cause any confusion for the receiving client. It is important to note that the exact timing of the appointment was not mentioned in the reminder message. This is because of two reasons. Firstly it simplified the reminder message that needed to be sent. Secondly this resulted in lesser chances of mistakes. Considering the overall goal of the research, it was thought that the exact timing of the CBT appointment had no role in the experiment rather only the day of the appointment was necessary to be known in advance so the researcher could schedule reminders accordingly. Thus, the exact time of the CBT appointment was excluded from the reminders that were sent to participants in the study.

3.3.7: Testing the Esendex service

Esendex offers a free trial for testing purposes. After setting a trial account text messages, both instant and scheduled text messages were transmitted successfully and on desired date and time using the Esendex website. Furthermore Esendex service was simple and easy to use with intuitive graphical user interface for all aspects of the research from uploading contact information to organising contacts database and scheduling and sending the messages.
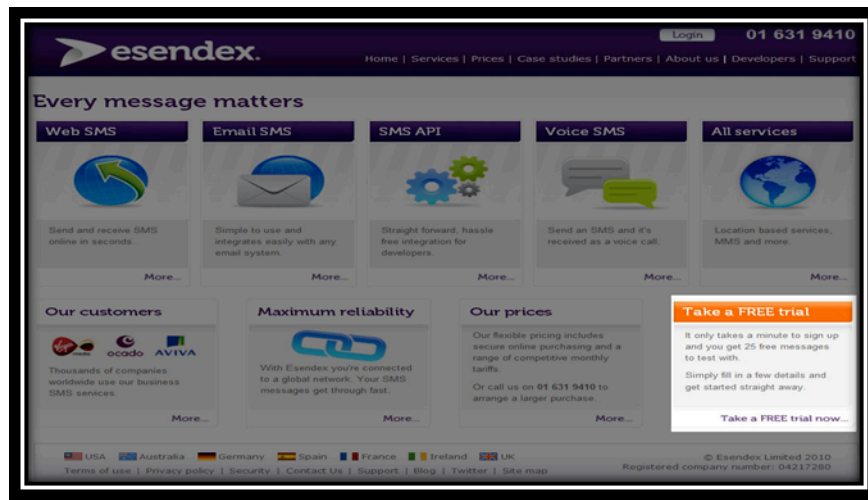
Figure 3.2: Esendex offers a free trial to test the service (www.esendex.ie).

3.3.8: Purchasing bulk SMS subscription from Esendex

200 text messages were bought from the company for the purpose of conducting this study. The total cost of this purchase was 40 Euros. Considering the limited scope of this research both time wise and number of participating volunteers, it was decided that 200 text messages would be enough for the purpose of the study.

3.3.9: Uploading contact numbers of volunteers

The mobile phone numbers of the two experimental arm volunteers were to be placed on the secure messaging service of Esendex. The website has an online interface in which multiple mobile numbers can be uploaded and a scheduling system can be setup in which a standard text message can be sent at a particular date and time to them. To build the contact numbers database the Esendex website provided instructions about putting the

mobile numbers in an excel document and then to upload the excel document to the setup personal account on to the website.

3.3.10: Scheduling text message reminders

The lists of study participant's mobile phone numbers were then placed on a schedule. The Esendex service allows scheduling text messages in bulk to be sent at a particular date and time. Once volunteer details had been uploaded to the Web SMS account, they were then placed upon a schedule to be sent automatically at the appropriate date and time before the planned and scheduled CBT appointments. This is explained by the following images of Esendex online services using desktop screen image capturing software. The clients were asked to acknowledge the receipt or non-receipt of the text message reminder for the appointment when they attend their CBT session with their therapists. It should also be noted in the following figure that Esendex service also allows voice messages to be sent on a fixed schedule and thus can be used in a comparison study of SMS text message and voice message reminders for appointments.

Figure 3.3: Setting a schedule for delivery of reminders (www.esendex.ie).
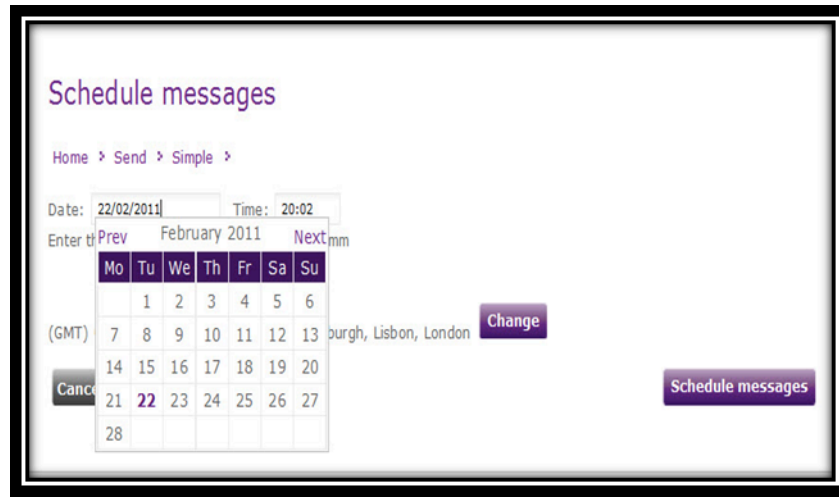
Figure 3.4: Messages can be scheduled in advance for automation

(www.esendex.ie).
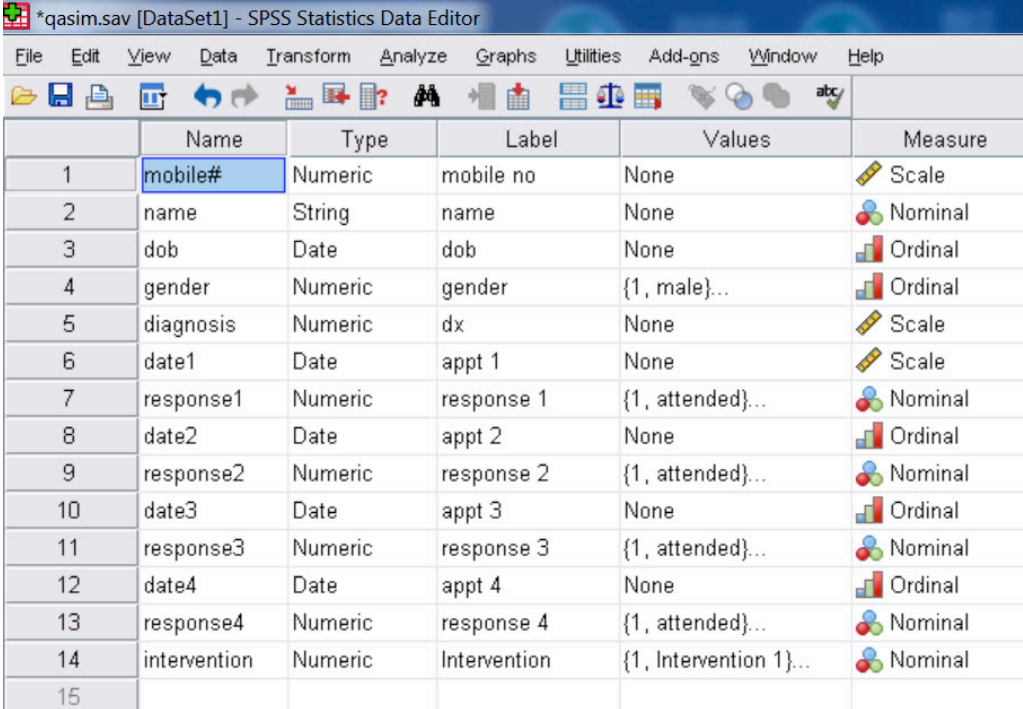
3.4: Duration of the study

At the beginning of the study, it was decided to run the experiment for ten weeks. This short duration of time was selected because of the limited time available to conduct the research experiment. There was a deadline to submit the dissertation and it was arbitrarily thought that an experiment of this nature could allow detection of differences in appointment rates of clients attending CBT who have been reminded of their appointment in comparison to those who had not been sent such reminders.

3.5: Collection and organisation of data

In the data collection phase of the study, details such as name, date of birth, gender, mobile phone number, diagnosis, dates of CBT appointments of the volunteers were

documented and stored on the personal laptop of the researcher that was secured with the use of password. These details were taken from the informed consent forms for the research that were returned by clients who were willing to participate in the study. Finally the attendance records of these clients were taken from their case files for the weeks that the experiment was taking place. The most important data that was required for the purpose of study was the day on which individual clients were attending CBT clinic and whether they attended the appointment or not. This data was organized in the statistics and data analysis software called SPSS. An image of the data sheet is provided below which explains the organisation of the collected data.

Figure 3.5: Organisation of data in SPSS (Variable view)

3.6: Analysis of data

For purpose of analysis of the collected data, there is a need to determine what type of statistical tests can be used. This is done in the following manner

3.6.1: Matching research design with statistics

Different types of research designs and data can be matched with various statistical tests for the purpose for analysis. To find the exact statistical tool that can be used in this research, there is a need to understand different scales of measurement for different types of data that is collected during research.

3.6.2: Scales of measurement

There are four terms that make up scales of measurement in research. It is vital to be able to determine which scale to use in selecting the correct research design and analysis tools. These scales are nominal, ordinal, ratio and interval scales. They are described in the following.

Nominal scale: This scale has no specific order or hierarchy e.g. Person either gets treated or does not get treated.

Ordinal scale: This set of categories has order but this order does not have equal distance or measurement between the categories. Ordinal scales are used for grading purposes e.g. Stages of cancer.

Interval scale: Each category in interval scale has an equal order on the scale e.g. Celsius scale for heat measurement is an interval scales

Ratio scale: A ratio scale has a true zero e.g. Kelvin scale for heat measurement is a ratio scale.

3.7: Chi-Square test

As already discussed, the research question for this study is a question of difference. Furthermore the type of data collected in this research i.e. attendance or non-attendance at CBT clinics is nominal data. Statistical analysis of research data collected for researching a question of difference, on a nominal level of measurement is done by chi-square test. The chi-square test is a tool to assess comparison. For the purpose of this research the test for "goodness to fit" is explained below.

3.8.1: Test of goodness to fit

This test establishes whether an observed result differs from an expected result. In this research, the observed results are the results obtained for the interventional arms of the study whereas the expected results are the results obtained from the control group. In other words, when we have to determine the difference between the expected value and observed value we can utilise chi-square testing (Wheeler, et al., 1983).

Chi-square is utilized when we want to test whether the number of individuals in different categories fit the null hypothesis. The null hypothesis for this research is that sending SMS text message reminders does not improve CBT appointment attendance rates. It can thus be seen how the observed results from the interventional arms, which are sent SMS text message reminders for their appointments, compare with and are different from the expected results from the control group that did not receive any reminders.

CHAPTER 4: RESULTS AND DISCUSSION

4.1: Results

A total of 20 clients attending CBT at Saint Patrick's University Hospital volunteered to participate in the study. Because of this it was decided to slightly change the experiment's methodology. Only two groups were created. One arm of the study was sent SMS text message reminders 24 hours before their appointment and this was compared with the control group, which was not sent any SMS text message reminders. The following are the results obtained after four weeks of progress in the study.

A total of 20 volunteers participated in the study. 10 clients were included in the experimental arm that received an SMS text message reminder and 10 clients were included in the control arm of the study that did not receive any reminder for their CBT appointments. The experiment was conducted over a period of four weeks. Of all the clients only three people in total missed appointments during this time. Two people missed two appointments each. Both these clients were males and one belonged to the experimental arm and one was in the control arm of the research. The third person, a female, missed one appointment and she happened to be in the control group of the research. One of the clients in the experimental group returned to attend CBT sessions after missing two appointments. The researcher confirmed the delivery of SMS messages by asking the clients about them. Two clients who missed appointments (1 from control group and 1 from experimental group) stated that they had travelled to another city to visit relatives and thus missed their CBT appointment. The most interesting observation in this study is that all three clients who missed their appointments had a diagnosis of

recurrent depressive disorder. It would be difficult however, to derive any conclusions for certain from these results as these can be purely coincidental and the amount of data gathered is very limited. For this reason statistical analysis of the available data has not been done. Further research is required to test the research question.

4.2: Qualitative Data

During recruitment of potential volunteers, clients were asked different questions for determining client eligibility as mentioned in the methodology sections of the dissertation. They were also asked some questions about their preferences for methods of appointment reminders. These questions were asked for rapport development with the clients. Preference for three-appointment reminder methods has been compared i.e. letters, SMS text messages and phone calls in this analysis.

53 people were asked questions about their preference for appointment reminders. An overwhelming majority of patients (47 out of 53) preferred phone call reminders a day before their appointment date as their preferred method for appointment reminders. 35 of them rated text message reminders as second preferred method. 12 of these 47 patients did not like text message reminders. Only 6 clients described text message reminders as their preferred method of appointment reminders. All the clients who preferred phone call reminders gave a single reason for their preference for it, which was their ability to change appointment date or time if they could not attend for any reason. Out of the 47 patients who preferred phone calls the majority (31 clients) also wanted a letter in the post detailing the appointment date, time and place, the rest did not want a letter reminding them of their appointment. Out of the six clients who preferred text message

reminders, two of them also wanted an appointment letter in the post. This data is represented in the graphs below.
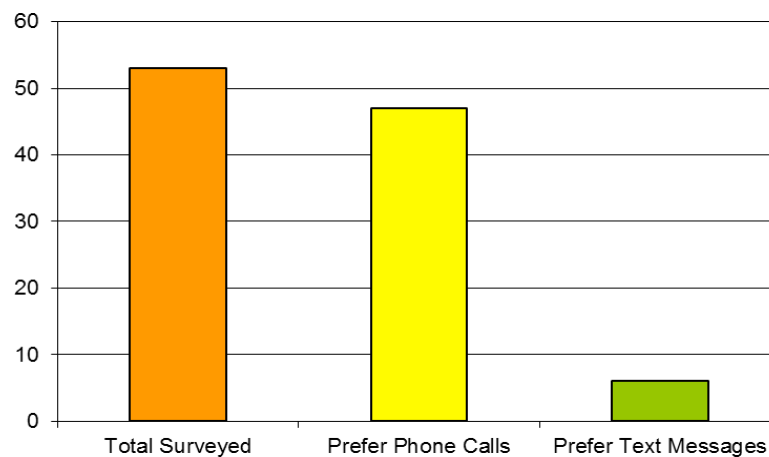
Figure 4.1: (Reminder Method Preference). y axis = number of participants
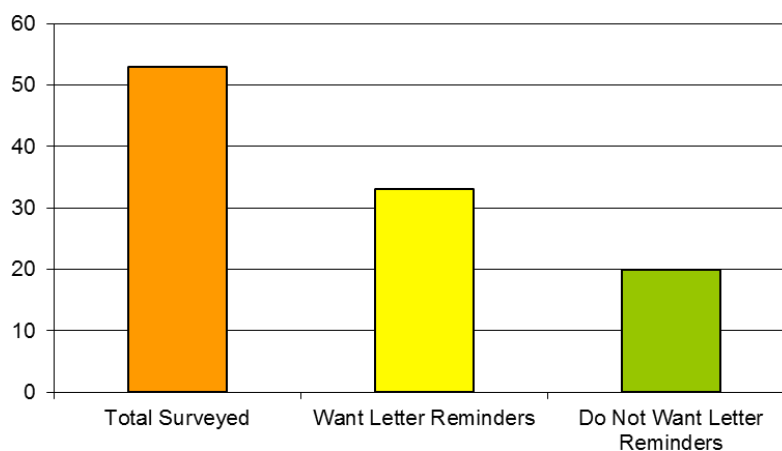
Figure 4.2: (Postal Letter Reminder Preference). y axis = number of participants

CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

During this study a few important problems were encountered. This is a short discussion of these problems and recommendations that can prevent these problems from occurring in a future research of similar design.

5.1: Volunteer Recruitment

Volunteer recruitment was very slow and limited from the start of the study. Despite the efforts of the CBT department therapists at Saint Patrick's University Hospital, informing the clients about the study and providing all the necessary details about it, few clients agreed to participate. The most important reason was lack of co-ordination by the CBT department with the researcher in the recruitment process. The researcher was not based at Saint Patrick's University Hospital in the initial period of the study. The researcher had explained the study details to the CBT department during meetings and was initially relying on the therapists to enrol volunteers. Interestingly the therapists who were able to recruit participants were those who were enthusiastic about the research and during the meetings with the researcher mentioned that they believed this research could prove valuable in improving attendance rates of clients who attended CBT sessions at Saint Patrick's University Hospital. Saint Patrick's Hospital has 14 full time cognitive behavioural therapist working full time running CBT clinics. 2 of those therapists mentioned that they did not ask many of their clients to participate in the study because they wanted the clients to take responsibility and keep their appointments without getting any type of reminders. This was part of their behavioural therapy itself.

The number of volunteers improved after the researcher started working at Saint Patrick's University Hospital and had direct interaction with potential volunteers attending CBT sessions at the hospital. Previously, the researcher was working at a different location and could only visit Saint Patrick's University Hospital during short breaks from his work. Another possible explanation of this increase in volunteers can be that clients were informed that the study would last only four weeks and they would not pay any money for getting these text messages. Some clients wanted to know if opting as a volunteer for this research study would cost them money like when premium number text messages are received by people. This information was not present in the research information document for potential volunteers.

Only twenty clients participated in the study. Only 53 people answered questions that provided qualitative data. Due to this reason the study was modified and only one interventional arm was setup instead of two as was initially proposed.

5.2: Experiment conducted for a short period of time

Due to the approaching deadline for the submission of the thesis, only four weeks' worth of data could be accumulated after a few clients had agreed to participate in the study.

5.3: Mistake in scheduling text messages

On two occasions, text messages were sent at inappropriate time during the night due to the use of 24-hour clock in scheduling system of the online SMS text message system.

The researcher made the mistake of sending these messages at 0100 hours instead of 1300 hours. This however, did not cause the clients to miss their appointments.

5.4: Conclusion

Further studies are required to confirm if SMS text message reminders improve attendance rates of CBT appointments or not. Due to the limited number of volunteers as well as an extremely short duration of time when the actual experiment was conducted, the study is unable to confirm the research question and in future studies more participants should be recruited and the experiment continued for a longer duration of time. Recommendations for a study of this type in the future would be to run the experiment of SMS text message reminders for at least six months and with more than 900 participants. This is because a similar study in Malaysia with this length of study and number of participants has shown significant results (Liew, et al., 2009).

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APPENDIX

STANDARD APPLICATION FORM

For the Ethical Review of Health-Related Research Studies

<u>which are not</u>

Clinical Trials of Medicinal Products For Human Use as defined in S.I. 190/2004

DO NOT COMPLETE THIS APPLICATION FORM
IF YOUR STUDY IS A CLINICAL TRIAL OF A MEDICINAL PRODUCT

This Application Form is divided into Sections.

Sections A, B, C, D, E, J, K, L are Mandatory

Sections F, G, H, and I are optional. Please delete Sections F, G, H, and I if these sections do not apply to the application being submitted for review.

IMPORTANT NOTE: It is imperative that the Standard Application Form is not completed if there is any possibility that the study for review is a clinical trial of medicinal product as defined by Statutory Instrument 190/2004.

IMPORTANT NOTE: Please refer to **Section I** within the form before any attempt to complete the Standard Application Form. **Section I** is designed to assist applicants in ascertaining if their research study is in fact a clinical trial of a medicinal product.

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

SECTION A GENERAL INFORMATION

SECTION A IS MANDATORY

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

A1 TITLE OF THE RESEARCH STUDY:

IMPACT OF SMS REMINDERS ON CBT APPOINTMENTS

A2 Principal Investigator(s):

Title: Dr.   **Name:** Qasim Hameed Afridi
Qualifications: M.B.B.S (Hon), Pakistan.
Position: Registrar
Dept: Psychiatry
Organisation: Trinity College Dublin
TEL: 0870624193
E-MAIL: AFRIDIQ@TCD.IE

 A3 (a) Is this a multi-site study?   No

A3 (b) Please name each site where this study is proposed to take place and state the lead investigator for each site:

Site:	Lead Investigator:
SAINT PATRICK'S HOSPITAL	QASIM HAMEED AFRIDI

 A4. CO-INVESTIGATORS: NOT APPLICABLE

A5. Overall contact person who is to receive correspondence in relation to this application / who is to be contacted if a query arises in relation to this application.

Title: Dr.   **Name:** Qasim Hameed Afridi
Address: 53 Saint John's Well Way, Kilmainham, Dublin 8
TEL (WORK):   **TEL (MOBILE):** 0870624193
E-MAIL: AFRIDIQ@TCD.IE

A6. Please provide a lay description of the study.

The proposed research project shall investigate the use of SMS text reminders to improve the attendance of clients taking CBT sessions at Saint Patrick's Hospital. Client's attendance records who receive text message reminders shall be compared with other clients who are not sent reminders before their CBT appointment.

A7 (A) IS THIS STUDY BEING UNDERTAKEN AS PART OF AN ACADEMIC QUALIFICATION?

Yes

A7 (b) IF YES, please complete the following:

Student Name: Qasim Hameed Afridi   **Course:** MSc Health Informatics
Institution: Trinity College Dublin   **Academic Supervisor:** Dr Bridget Kane

SECTION B STUDY DESCRIPTORS

B1. Provide information on the study background.

The proposed study is for a dissertation project for MSc Health Informatics Trinity College Dublin.

B2. List the study aims and objectives.

To investigate if SMS reminders for CBT appointments help improve attendance and if other variables like diagnosis, medications and gender have an impact on the outcome.

B3. List the study endpoints (if applicable).

Data shall be collected from January 2011 to March 2011

B4. Provide information on the study design.

This shall be a cohort study with three arms. Two groups shall form the experimental arms of the study. The third group shall be the control arm of the study. One experimental arm group shall be sent text messages reminding them of their CBT appointments a day prior to their appointment, the second experimental arm group shall be sent text messages a day prior to the appointment as well as on the morning of the appointment day and the third group shall not be sent the text message reminder. The appointment keeping records of the three groups shall then be compared for any statistical difference.

B5. Provide information on the study methodology.

Participants for the study shall be selected from clients attending CBT at Saint Patrick's Hospital after the research aims are explained to them and they agree to participate in the study with informed consent. Three arms of the study shall then be prepared with two experimental arms and one control arm. The two experimental group's mobile numbers shall be placed on the secure website setup by the IT department of Saint Patrick's Hospital and they shall be sent SMS reminders before their appointments. This is done over the period of study and their attendance or non-attendance is documented and compared with the attendance or non-attendance of the control group, who are not sent the SMS reminder. Attendance rates are checked for difference in other variables like gender, diagnosis and the medications that the clients are on at the time of the study.

B6. What is the anticipated start date of this study?

20th January, 2011

B7. What is the anticipated duration of this study?

10 weeks.

B8 (a) <u>How many</u> research participants are to be recruited <u>in total</u>?

The maximum possible number of clients who volunteer as participants shall be selected for the study.

B8 (b) <u>How many</u> research participants are to be recruited <u>per treatment group</u> (if applicable)?

Consenting participants shall be randomly assigned to one of the groups in the study in permuted blocks.

B8 (c)   Provide information on the statistical approach to be used (if appropriate) / source of any statistical advice.

The three cohort groups (experimental and control groups) will be compared using their attendance records of CBT appointments for any statistical difference between the two groups. The statistical tests that can be used for detecting this difference are the *t*-Test and Multivariate statistical analysis. Statistical advice shall be taken from the supervisor Dr Bridget Kane at Trinity College Dublin.

B8 (d)   Please give a brief justification of sample size and details of the sample size calculation (including minimum clinically important difference).

The research shall detect any statistical difference between the three arms of the study including the two experimental arms and one control arm. The maximum number of participants who volunteer shall be included in the study. To include all potential volunteers in the study is necessary to detect a possible statistical difference between the three groups as a small number of participants may not give us accurate results or detect any statistically significant difference if it exists between the experimental and control groups.

SECTION C STUDY PARTICIPANTS

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

SECTION C1 PARTICIPANTS – SELECTION AND RECRUITMENT

C1. 1 How many research participants are to be recruited? At each site (if applicable)? And in each arm of the study (if applicable)?

NAME OF SITE:	NAMES OF ARMS (IF APPLICABLE)		
	INSERT NAME OF ARM (IF APPLICABLE):	INSERT NAME OF ARM (IF APPLICABLE):	INSERT NAME OF ARM (IF APPLICABLE):
Saint Patrick's Hospital	Experimental 1	Experimental 2	Control

C1.2 How will the participants in the study be selected?

Clients attending CBT at Saint Patrick's Hospital shall be selected and assigned to the different arms of the study randomly.

C1.3 How will the participants in the study be recruited?

Potential recruits will be given a verbal request and explanation of the study and asked if they would be willing to consider participation. If they are willing, they will be given an information sheet about the study and study consent form. They will have a week to read the information sheet consider participation and to sign and return the consent form.

C1.4 What are the main inclusion criteria for research participants? (please justify)

The main inclusion criterion is attendance of CBT session at Saint Patrick's Hospital. Recruits for the study can be both inpatient and outpatient attendees.

C1.5 What are the main exclusion criteria for research participants? (please justify)

Clients less than 18 years of age shall be excluded from the study.

C1.6 Will any participants recruited to this research study be simultaneously involved in any other research project?

There will be a Behavioural Activation study with inpatients at the same time for depressed patients on Grattan Ward only.

SECTION C2   PARTICIPANTS – INFORMED CONSENT

C2.1 (a) Will informed consent be obtained? Yes

C2.1 (c) If yes, how will informed consent be obtained and by whom?

Potential recruits will be given a verbal request and explanation of the study and asked if they would be willing to consider participation. If they are willing, they will be given an information sheet about the study and study consent form. They will have a week to read the information sheet to consider participation and to sign and return the consent form.

C2.1 (d) If yes, will participants be informed of their right to refuse to participate and their right to withdraw from this research study?   Please elaborate.

The informed consent form shall include the information that all participation in the study is voluntary and the clients have the right to refuse participation and withdraw from the study at any stage.

C2.1 (e) Will there be a time interval between giving information and seeking consent?
No

C2.1 (f) If yes, please elaborate. Not Applicable

C2.1 (g) If no, please justify.

The study shall be explained in simple terms and clients do not have to do anything except give their consent for the study and acknowledge the receipt or non-receipt of the text message reminder for the appointment when they arrive for their CBT session.

SECTION C3   ADULT PARTICIPANTS – CAPACITY

C3.1 (a) Will all adult research participants have the capacity to give informed consent? YES

C3.1 (c) If no, is this research of such a nature that it can only be carried out on adults without capacity? No

SECTION C4   PARTICIPANTS UNDER THE AGE OF 18

C4.1 (a) Will any research participants be under the age of 18 i.e. Children?
No

SECTION C5　　　PARTICIPANTS – CHECKLIST

Please confirm if any of the following groups will participate in this study. This is a quick checklist for research ethics committee members <u>and it is recognised that not all groups in this listing will automatically be vulnerable or lacking in capacity.</u>

C5.1 Patients Yes
C5.2 Unconscious patients No
C5.3 Current psychiatric in-patients Yes
C5.4 Patients in an emergency medical setting No
C5.5 Relatives / Carers of patients No
C5.6 Healthy Volunteers No
C5.7 Students No
C5.8 Employees / staff members No
C5.9 Prisoners No
C5.10 Residents of nursing homes No
C5.11 Pregnant women No
C5.12 Women of child bearing potential Yes
C5.13 Breastfeeding mothers Yes
C5.14 Persons with an acquired brain injury No
C5.15 Intellectually impaired persons No
C5.16 Elderly / aged persons > 65 No

C5.17 If yes to any of the above, what special arrangements have been made to deal with issues of consent and assent (if any)?

An information sheet which explains the study in simple terms shall be provided to the potential participants of the study and clients shall be made aware through the informed consent form that their participation at all stages of the research is voluntary and they have the right to withdraw from participating in the study at any time.

SECTION D RESEARCH PROCEDURES

SECTION D IS MANDATORY

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

D1. WHAT RESEARCH PROCEDURES OR INTERVENTIONS (OVER AND ABOVE THOSE CLINICALLY INDICATED AND/OR OVER AND ABOVE THOSE WHICH ARE PART OF ROUTINE CARE) WILL RESEARCH PARTICIPANTS UNDERGO WHILST PARTICIPATING IN THIS STUDY?

PARTICIPANT IN EXPERIMENTAL ARM 1 SHALL RECEIVE SMS CBT APPOINTMENT REMINDERS A DAY PRIOR TO THEIR APPOINTMENT. PARTICIPANTS IN EXPERIMENTAL ARM 2 SHALL RECEIVE TEXT MESSAGE REMINDERS TWICE. THE FIRST TEXT REMINDER SHALL BE SENT A DAY PRIOR TO THE APPOINTMENT AND A SECOND TIME ON THE MORNING OF THE APPOINTMENT DAY. THE CONTROL ARM SHALL NOT RECEIVE ANY TEXT MESSAGE REMINDERS.

D2. If there are any potential harms resulting from any of the above listed procedures, provide details below:

Not Applicable

D3. What is the potential benefit that may occur as a result of this study?

The use of SMS technology in improving CBT appointment attendance.

D4 (A) WILL THE STUDY INVOLVE THE WITHHOLDING OF TREATMENT?

NO

D5. HOW WILL THE HEALTH OF PARTICIPANTS BE MONITORED DURING AND AFTER THE STUDY?

Not Applicable

D6 (A) WILL THE INTERVENTIONS PROVIDED DURING THE STUDY BE AVAILABLE IF NEEDED AFTER THE TERMINATION OF THE STUDY? YES

D6 (B) IF YES, PLEASE STATE THE INTERVENTION YOU ARE REFERRING TO AND STATE WHO WILL BEAR THE COST OF PROVISION OF THIS INTERVENTION?

The study shall require the use of secure website set up by IT department of Saint Patrick's Hospital for uploading mobile number contact information and a Microsoft Office plugin shall be used for secured texting via the internet.

D7. PLEASE COMMENT ON HOW INDIVIDUAL RESULTS WILL BE MANAGED.

ATTENDANCE RECORDS SHALL BE COLLECTED AFTER APPOINTMENTS FOR CONTROL AND EXPERIMENTAL ARMS FROM THE PATIENT FILES. THE ATTENDANCE RECORD SHALL BE PLACED ON A PASSWORD SECURED LAPTOP BELONGING TO THE PRINCIPAL INVESTIGATOR, DR QASIM HAMEED AFRIDI.

D8. PLEASE COMMENT ON HOW AGGREGATED STUDY RESULTS WILL BE MADE AVAILABLE.

Dissertation for MSc Health Informatics.

D9.   WILL THE RESEARCH PARTICIPANT'S GENERAL PRACTITIONER BE INFORMED THE RESEARCH PARTICIPANT IS TAKING PART IN THE STUDY (IF APPROPRIATE)? NON-APPLICABLE

D10. WILL THE RESEARCH PARTICIPANT'S HOSPITAL CONSULTANT BE INFORMED THE RESEARCH PARTICIPANT IS TAKING PART IN THE STUDY (IF APPROPRIATE)? YES

SECTION E DATA PROTECTION

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

SECTION E1   DATA PROCESSING – CONSENT

E1.1 (A) WILL CONSENT BE SOUGHT FOR THE PROCESSING OF DATA? YES

E1.1 (B) IF NO, PLEASE ELABORATE.

SECTION E2   DATA PROCESSING – GENERAL

E2.1 WHO WILL HAVE ACCESS TO THE DATA WHICH IS COLLECTED?

DR QASIM HAMEED AFRIDI AND STUDY SUPERVISOR DR BRIDGET KANE.

E2.2 WHAT MEDIA OF DATA WILL BE COLLECTED?

CBT appointments attendance record, date, age, gender, diagnosis and medications of the participants of the study at Saint Patrick Hospital shall be collected from the health records as an electronic copy on a password protected laptop.

E2.3 (A) WOULD YOU CLASS THE DATA COLLECTED IN THIS STUDY AS anonymous, irrevocably anonymised, pseudonymised, coded or identifiable data?

Pseudonymised

E2.3 (B) IF 'CODED', PLEASE CONFIRM WHO WILL RETAIN THE 'KEY' TO RE-IDENTIFY THE DATA?

NOT APPLICABLE

E2.4 WHERE WILL DATA WHICH IS COLLECTED BE STORED? PATIENT FILES AT SAINT PATRICK'S HOSPITAL AND PASSWORD PROTECTED LAPTOP BELONGING TO THE PRINCIPLE INVESTIGATOR.

E2.5   PLEASE COMMENT ON SECURITY MEASURES WHICH HAVE BEEN PUT IN PLACE TO ENSURE THE SECURITY OF COLLECTED DATA.

THE APPOINTMENT RECORDS SHALL BE KEPT ON A PASSWORD PROTECTED LAPTOP BELONGING TO THE PRINCIPAL INVESTIGATOR. THE DATA SHALL BE ANONYMOUS

AND LINKED TO MOBILE PHONE NUMBERS INSTEAD OF CLIENT'S NAME OR HOSPITAL NUMBER.

E2.6 (A) WILL DATA COLLECTED BE AT ANY STAGE LEAVING THE SITE OF ORIGIN? POSSIBLY

E2.6 (B) IF YES, PLEASE ELABORATE.

MOBILE PHONE NUMBERS SHALL BE UPLOADED TO THE SECURE WEBSITE SETUP BY THE IT DEPARTMENT OF SAINT PATRICK'S HOSPITAL. ATTENDANCE RECORDS SHALL BE PLACED AND PROCESSED IN PASSWORD PROTECTED LAPTOP BY THE PRINCIPAL INVESTIGATOR. AS FAR AS POSSIBLE, IT IS ANTICIPATED THAT DATA ANALYSIS WILL TAKE PLACE ON SITE.

E2.7 WHERE WILL DATA ANALYSIS TAKE PLACE AND WHO WILL PERFORM DATA ANALYSIS (IF KNOWN)?

DR QASIM HAMEED AFRIDI USING PASSWORD PROTECTED LAPTOP.

E2.8 (A) AFTER DATA ANALYSIS HAS TAKEN PLACE, WILL DATA BE DESTROYED OR RETAINED?

All collected data shall be permanently destroyed following completion of the study.

E2.8 (B) PLEASE ELABORATE. ALL ELECTRONIC DATA SHALL BE PERMANENTLY DELETED ON COMPLETION OF THE STUDY.

E2.8 (C) IF DESTROYED, HOW, WHEN AND BY WHOM WILL IT BE DESTROYED?

DR QASIM HAMEED AFRIDI SHALL DELETE THE COLLECTED DATA PERMANENTLY ON COMPLETION OF THE STUDY.

E2.8 (D) IF RETAINED, FOR HOW LONG, FOR WHAT PURPOSE, AND WHERE WILL IT BE RETAINED?

Data shall be retained for the duration of the study period.

E2.9 PLEASE COMMENT ON THE CONFIDENTIALITY OF COLLECTED DATA.

No names shall be used and data will be linked to mobile numbers of the clients attending CBT sessions only.

E2.10 (A) WILL ANY OF THE DATA COLLECTED CONSIST OF AUDIO RECORDINGS / VIDEO RECORDINGS? NO

E2.11 (A) WILL ANY OF THE DATA COLLECTED CONSIST OF PHOTOGRAPHS / VIDEO RECORDINGS?
NO

SECTION E3 ACCESS TO HEALTH CARE RECORDS

E3.1 (A) DOES THE STUDY INVOLVE ACCESS TO HEALTHCARE RECORDS (HARD COPY / ELECTRONIC)? YES

E3.1 (B) IF YES, PLEASE ELABORATE.

Attendance or non-attendance of CBT appointment shall be checked against mobile numbers list from the hard copy health records. The researcher proposes to have access to charts of patients enrolled in the study to determine, age, gender, diagnosis, medications and attendance record at appointments during the period of the study.

E3.1 (C) WHO WILL ACCESS THESE HEALTHCARE RECORDS?

THE HEALTHCARE RECORDS SHALL BE ACCESSED BY THE PRINCIPAL INVESTIGATOR, DR QASIM HAMEED AFRIDI.

E3.1 (D) WILL CONSENT BE SOUGHT FROM PATIENTS FOR RESEARCH TEAM MEMBERS TO ACCESS THEIR HEALTHCARE RECORDS? YES

E3.2 (A) WHO OR WHAT LEGAL ENTITY IS THE DATA CONTROLLER IN RESPECT OF THE HEALTHCARE RECORDS?

DR QASIM HAMEED AFRIDI IS A PSYCHIATRIC TRAINEE REGISTRAR ON THE DUPRTP.

E3.2 (B) WHAT MEASURES HAVE BEEN PUT IN PLACE BY THE DATA CONTROLLER WHICH MAY MAKE ACCESS TO HEALTHCARE RECORDS PERMISSIBLE WITHOUT CONSENT?

NONE ARE NECESSARY AS RECORDS WILL NOT BE ACCESSED WITHOUT CONSENT.

SECTION J INDEMNITY

SECTION J IS MANDATORY

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

J1 (A) IS EACH SITE IN WHICH THIS STUDY IS TO TAKE PLACE COVERED BY THE CLINICAL INDEMNITY SCHEME (CIS)? YES

J2 (A) IS EACH MEMBER OF THE INVESTIGATIVE TEAM COVERED BY THE CLINICAL INDEMNITY SCHEME (CIS)? YES

J3 (A) WHO OR WHAT LEGAL ENTITY IS THE SPONSOR OF THIS RESEARCH STUDY?

TRINITY COLLEGE DUBLIN

SECTION K COST AND RESOURCE IMPLICATIONS AND FUNDING

SECTION K IS MANDATORY

IMPORTANT NOTE: This application form permits the applicant to delete individual questions within each section depending on their response to the preceding questions. Please respond to each question carefully and refer to the accompanying Guidance Manual for more in-depth advice prior to deleting any question.

K1 (A) ARE THERE ANY COST / RESOURCE IMPLICATIONS RELATED TO THIS STUDY? NO

K2 (a) Is funding in place to conduct this study? NO
K2 (b) If no, has funding been sought to conduct this study? NO

K2 (c) Please state the source of funding (industry, grant or other) and the amount of funding.

The study shall be self-funded by the principle researcher Dr Qasim Hameed Afridi. The proposed study requires minimal funds and resources which include the use of computer for data analysis and storage, internet based mobile texting service and printing of consent forms, attendance record forms and information sheets for the participants.

SECTION L ETHICAL ISSUES

SECTION L IS MANDATORY

L1. Please identify any ethical issues which this project raises and discuss how you have addressed these issues.

The only ethical issue which the project raises is the principal investigator having access to contact information and access to health records of the participants. The researcher proposes to have access to charts of patients enrolled in the study to determine, age, gender, diagnosis, medications and attendance record at appointments during the period of the study. The principal

investigator of the study is a trainee in the Dublin University Psychiatry Rotational Training Program and thus bound by the same code of ethics and confidentiality as practiced at Saint Patrick's University Hospital. Strict protocols for protection of data and confidentiality shall be maintained during the research like the use of passwords to protect data on computer and collection of attendance records data in person by the principal investigator.

<u>Consent Form</u>

Title of Project: Impact of SMS reminders on CBT appointments

Patient ID: ……………… **Patient's Mobile Phone #: …………………..**

Appointment Attendance Days: …………………………………..

Please Read The Statements Below And Complete As Necessary

Please tick your response in the appropriate box

I have read and understood the attached Participant information leaflet   Yes ☐   No ☐

I have had the opportunity to ask questions and discuss the study   Yes ☐   No ☐

I have received satisfactory answers to all my questions   Yes ☐   No ☐

I understand that I am free to withdraw from the study at any time without giving a reason and without this affecting my future medical care   Yes ☐   No ☐

I agree to take part in this study without prejudice to my legal or ethical rights   ☐   ☐
                     Yes   No

Please sign, date and print your name in the appropriate space below

Participant's Signature: _____ _   Date: _____

Participant's Name in Print: _____

Witness Signature:* _____ ___   Date: _____

Witness' Name in Print: _____

Investigator's Signature: _____   Date: _____

Investigator's Name in Print: _____ _____

Impact of SMS reminders on CBT appointments study Information sheet

Dear

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve for you. This Participant information sheet will tell you about the purpose, risks and benefits of this research study. If you agree to take part, we will ask you to sign a consent form. If there is anything that you are not clear about, we will help to explain it to you. As we are trying to start the research as soon as possible, we would be grateful if you could complete the consent form within 5 days if you have made a decision by then. However, please take as much time as you need to read it. You should only consent to participate in this research study when you feel that you understand what is being asked of you, and you have had enough time to think about your decision.

Purpose of study:

We are looking at the benefits of using text message reminders for Cognitive Behavioural Therapy appointments aiming to test if text message reminders improve the attendance of CBT appointments. We are asking all people getting Cognitive Behavioural Therapy at Saint Patrick's Hospital to participate in this study.

What will taking part involve:

Should you agree to take part in this work, we would be asking you to consent to be part of one of the three groups that shall participate in the study. The first group of participants in the study shall receive text message reminder for the Cognitive Behavioural Therapy appointment, one day before the appointment day. The second group of participants in the study shall be sent text message reminder for the Cognitive Behavioural Therapy appointment one day before the appointment day as well as on the morning of the appointment day. The third group of participants in the study shall not be sent any text message reminders for the Cognitive Behavioural Therapy appointment. This study shall continue for 10 weeks. The text message reminders shall be sent over the internet using secure websites and service for sending text messages. If you are on any medication, you would not be required to stop taking your regular medication. We would also be asking you to inform your therapist if you received a text message reminder for the Cognitive Behavioural Therapy appointment during your therapy session.

Do I have to take part?

We would also like to take this opportunity to inform you that taking part in this work is completely voluntary. It is up to you to decide whether or not o take part. Should you chose to start, we would be encouraging you to complete it but should you wish to stop at any point, you would be able to do so, without it affecting any of your other treatment at St Patrick's University Hospital, St Edmondsbury or The Dean Clinics. Based on the research that has been conducted so far on using mobile phone text messages for appointment reminders, we do not foresee any risks to you in participating in this study. If you are in one of the two groups that receive text message

reminders for keeping Cognitive Behavioural Therapy appointment, you are likely to benefit as it will help you remember to keep your appointment.

Compensation:

Unfortunately, we are not in a position to offer any payment (financial or otherwise). All information you provide will be stored and held in the strictest confidence to protect your identity and will not be shared with anyone else.

Confidentiality:

Any information that you give us will be treated in the strictest confidence and will not be shared with anyone else. The information collected in the research study will be stored in a way that protects your identity. Results from this study will be reported as group data so that your individual identity will not be revealed in any way.

Your consultant at Saint Patrick's Hospital shall be informed that you are participating in this study.

Complaints:

If you have complaints about your participation in the study, you can speak to any of the people names at the end of this information sheet. If you wish to speak to someone independent and in confidence, you may contact the Chairperson of St Patrick's University Hospital Research Ethics Committee, St Patrick's Hospital, James's Street, Dublin 8.

Questions:

I you have any questions about this study; please do not hesitate to ask Dr Qasim Afridi through the ward office. If you understand this information, have no questions and wish to give your consent please sign the consent form that is provided to you and return to the Ward Office. Please remember, your participation is strictly voluntary and you would be free to change your mind at any point.

I would like to take this opportunity to thank you for taking part in this research study.

Yours sincerely

Dr Qasim Afridi

Registrar Psychiatry

Dublin University Psychiatry Rotational Training Program

The impact of SMS reminders on CBT appointments. Research Protocol

Qasim Afridi, Bridget Kane.

Proposed Title: The impact of SMS reminders on CBT appointments.

A few studies have been done to find the effect of reminders using mobile phone technology on the attendance rates of clients attending various health services clinics (Downer, S.R., Meara, J.G., & DaCosta, A.C, 2005) (Koshy, E., Car, J., & Majeed, A, 2008) (Kwok Chi Leonga et al, 2006) (Chen ZW et el, 2008). The proposed study will investigate if text message reminders before CBT appointments improve attendance rates of clients who are attending CBT sessions at Saint Patrick's Hospital.

Methods:

Subjects: The maximum number of clients attending CBT sessions at Saint Patrick's Hospital shall be given the opportunity to take part in the study. The study will continue for 10 weeks. Refusal to take part will not result in any penalties or any effect on other treatment received. Inclusion criteria will include literacy in English; capacity to give consent; age above 18 years. Exclusion criteria will include clients below the age of 18 years and non-English speaking.

Outcomes: The study aims to detect any difference in the attendance rates of clients receiving CBT who are sent SMS reminders before their appointment compared to clients who are not sent SMS reminders for their appointments.

Intervention: This shall be a cohort study with three arms. Two groups shall form the experimental arms of the study. The third group shall be the control arm of the study. One experimental arm group shall be sent text messages reminding them of their CBT appointments a day prior to their appointment, the second experimental arm group shall be sent text messages a day prior to the appointment as well as on the morning of the appointment day and the third group shall not be sent the text message reminder. The appointment keeping records of the three groups shall then be compared for any statistical difference. Participants for the study shall be selected from clients attending CBT at Saint Patrick's Hospital after the research aims are explained to them and they agree to participate in the study with informed consent. Three arms of the study shall then be prepared with two experimental arms and one control arm. The two experimental group's mobile numbers shall be placed on the secure website setup by the IT department of Saint Patrick's Hospital and they shall be sent SMS reminders before their appointments. This is done over the period of study and their attendance or non-attendance is documented and compared with the attendance or non-attendance of the control group, who are not sent the SMS reminder. Attendance rates are checked for difference in other variables like gender, diagnosis and the medications that the clients are on at the time of the study.

The clients will acknowledge the receipt or non-receipt of the text message reminder for the appointment when they attend their CBT session.

Statistical Analysis:

The three cohort groups (experimental and control groups) will be compared using their attendance records of CBT appointments for any statistical difference between the two groups. The statistical tests that can be used for detecting this difference are the T Test and Multivariate

statistical analysis. Statistical advice shall be taken from the supervisor Dr Bridget Kane at Trinity College Dublin.

Costs of the study:

The research study would require minimal funding as Saint Patrick's Hospital has already setup a secured website for the purpose of conducting such a study. The study would require computer and internet access for the duration of the study for sending text messages, recording and analysing data and printing information and consent forms.

References:

Downer, S.R., Meara, J.G., & DaCosta, A.C 2005. Use of SMS text-messaging to improve outpatient attendance. The Medical Journal of Australia, 183(7), 366-368.

Koshy, E., Car, J., & Majeed, A 2008. Effectiveness of mobile-phone short message service (SMS) reminders for ophthalmology outpatient appointments: observational study. BMC Ophthalmology. 8-9.

Kunutsor S, Walley J, Katabira E, Muchuro S, Balidawa H, Namagala E, Ikoona E, 2010. Using Mobile Phones to Improve Clinic Attendance amongst an Antiretroviral Treatment Cohort in Rural Uganda: A Cross-sectional and Prospective Study. Nuffield Centre for International Health and Development, Institute of Health Sciences, Leeds University, Leeds, UK.

Chen ZW, Fang LZ, Chen LY, Dai HL, 2008. Comparison of an SMS text messaging and phone reminder to improve attendance at a health promotion center: a randomized controlled trial. J Zhejiang Univ Sci B. 2008 January; 9(1): 34–38

Kwok Chi Leonga, Wei Seng Chenb, Kok Weng Leongc, Ismail Masturad, Omar Mimie, Mohd Amin Sheikhf, Abu Hassan Zailinawatig, Chirk Jenn Ngh, Kai Lit Phuai and Cheong Lieng Tengj 2006, The use of text messaging to improve attendance in primary care: a randomized controlled trial Family Practice, Volume 23, Issue 6, pp 699-705

20th December 2010

Dr. Qasim Afridi
53 St. John's Well Way
Kilmainham
Dublin 8

Re: **SMS Reminders for CBT Appointments** *(Protocol No. 28/10)*

Dear Dr. Afridi,

Thank you for your application to the St Patrick's University Hospital Research Ethics Committee. We are keen to facilitate your application, but we cannot do so until the following matters are addressed:

1) In answer to question D10 on the application form, you have indicated that the consultant will be informed that the research participant is taking part in the study. However, no separate information for the consultant has been submitted with your application. In addition, there is no indication on the participant information sheet or on the consent form that you will be making contact with their consultant.

2) In answer to question E1.1 (a), you have stated that consent will not be sought. However, you have submitted a consent form.

3) The answer to question E2.2 does not indicate the media of data being collected, i.e. hard copy, electronic copy, audio or visual.

4) Your answer to question E3.1 (b) does not encompass all details that are to be accessed from the healthcare records, thereby contradicting your answer to question L1.

5) Questions K2(a) and (b) should be answered appropriately.

6) Your answer to question L1 does not identify or address any ethical issues.

7) In addition, there were many questions answered that could have been deleted. You may want to refer to the guidance manual on our website to determine these.

8) The title of your research protocol is slightly different to the application title. The title of your research should be identical on all documentation.

If you wish this application to still be considered at the forthcoming ethics committee meeting, we would request that you respond to this letter with the necessary adjustments **by December 29th, 2010**. These adjustments can be made electronically and sent by email to my secretary at jbraddock@stpatsmail.com. If we do not hear from you, your application will not be considered at the meeting next month.

St. Patrick's Hospital

St. Patrick's
Hospital

Please reply to:
St. Patrick's Hospital, P.O. Box 136, James's St., Dublin 8.
Tel: 01 249 3200   Fax: 01 679 8865
www.stpatrickshosp.com

PRIVATE & CONFIDENTIAL

19th January 2011

Dr. Qasim Afridi
53 St. John's Well Way
Kilmainham
Dublin 8

Re: Impact of SMS Reminders on CBT Appointments *(Protocol No. 28/10)*

Dear Dr. Afridi,

Your application was considered at the Research Ethics Committee (REC) meeting held on **January 18th, 2011,** in the Conference Room at St. Patrick's University Hospital.

Your application was granted full ethical approval by the following committee members, who were in attendance at this meeting:

The Very Reverend Dermot Dunne – Chairman
Dr. Emer Keeling
Professor Jim Lucey
Professor Declan McLoughlin
Dr. Bré Sullivan
Mrs. Marie Tuohy
Prof. John Waddington

Approval was granted subject to the following standard conditions:

1. You must adhere fully to the terms and conditions set out in your research protocol.
2. If there are any material changes to be made to Protocol 28/10 in the next 12 months, you must contact the Research Ethics Committee for approval.
3. You must report back to the Research Ethics Committee no later than 12 months subsequent to this approval letter (January 19th, 2012), with a summary report on the progress of this research. This report should include, but is not limited to:
    - Progress to date or outcomes in the case of a completed project.
    - A statement of compliance with the approved proposal and/or minor amendments to the proposal and a justification of these.
    - A description of measurements taken to maintain and secure personal information/records pertaining to the research.

Thank you for your cooperation. With very best wishes.

Yours sincerely,

JAMES V. LUCEY MD., Ph.D., FRCPI., FRCPsych.,
SECRETARY TO THE RESEARCH ETHICS COMMITTEE

cc.   *Dr. Michael McDonough, Study Supervisor*

St. Edmundsbury,
Lucan, Co. Dublin.
Tel: 01 621 8200   Fax: 01 628 2979

Changing perceptions