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No Shows: Effectiveness of Termination Policy and Review of Best Practices

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Abstract

The primary objective of the study was to identify whether the implementation of Patient No Show and Termination policy at Five Rivers Health Centers (FRHC) is associated with a significant reduction of its no show rate. The secondary objective was to perform the best practices review on other strategies to reduce no shows. The data for this study was obtained retrospectively from the electronic medical records of the seven clinical centers of FRHC. Individual clinic's no show rates and cumulative no show rates for pre-implementation and post-implementation period were calculated. Chi-squared test were used to detect statistical significance between pre- and post-implementation period. The best practices review was performed using peer reviewed research studies (studies conducted in US and published between 1990 and 2013). The analysis found that the aggregate no show rate of FRHC clinics decreased during the post policy period and the difference was a decrease of 10% ($p<0$ .001). The individual clinic's analysis showed there was statistically significant reduction in no show rates of four clinics: FRHC Center for Women Health, FRHC Family Practice, FRHC Primary Care Ludlow, and FRHC Specialty Clinic Apple. The best practices review suggests that telephone, mail, exit interview, open access scheduling all improved attendance at a moderate rate. When considering the technology penetration and efficacy, telephone reminder proves to be a good mode of appointment reminder strategy.

Keywords: reminder system, non-attendance, telephone calls, patient compliance, scheduling

No Shows: Effectiveness of Termination Policy and Review of Best Practices

Patient no shows or non-attendance is one of the major problems faced by healthcare organizations. Patients schedule an outpatient appointment, do not cancel appointment but do not appear for the care at the specified date, time and location (Stubbs, Geraci, Stephenson, Jones, & Sanders, 2012). The no show rates can vary from one healthcare setting to another (McClure, Newell, & Edwards, 1996). One study reported that the no show rate in US primary care practice can vary from as little as 5% to as much as 55% (George & Rubin, 2003). Some of the most common reasons the patients given for not showing up are "high healthcare cost, problem with transportation, coordination and logistics, could not get off work, forgot appointments, felt better, felt too bad to leave home" (Boyette & Sirois, 2011).

No shows are most commonly seen among younger patients, patients of low socio-economic status and patients who have a previous history of failed appointment/appointments (Boyette & Sirois, 2011). The time between scheduling an appointment and the appointment date also contributes to the non-attendance (Boyette & Sirois, 2011). Health insurance availability and the type of insurance reportedly affect attendance (Oppenheim, Bergman, & English, 1979). In addition, no shows are often seen among self-paying patients and patients who have state funded health insurance (George & Rubin, 2003).

With rapidly increasing health care cost and the necessity to improve the healthcare delivery and efficiency, healthcare organizations are forced to control cost through the efficient use of the clinical resources, and at the same time, provide high quality care (LaGanga & Lawrence, 2007). A high rate of no shows in any healthcare organization may lead to decreased productivity and efficiency. In order to offset the lost productivity and efficiency, healthcare organizations make administrative changes that can increase the cost of healthcare, reduce

patients' access to healthcare, increase hospitalization and increase the emergency room visits (LaGanga & Lawrence, 2007). As a result, it is becoming increasingly important to raise the awareness of no show among the patients.

In order to reduce the negative impact of high no show rates, healthcare organizations have implemented various interventions. Some of the common interventions include telephone reminders, text/short message services, electronic mails and open access scheduling, charging for missed appointments, termination policy and exit interviews (Stubbs et al., 2012). Studies which are conducted to analyze the effectiveness of the interventions have found that many of these interventions have not helped in the complete elimination of no shows however there was a significant reduction in the percentage of nonattendance.

Background

The current study was conducted at Five River Health Center-FRHC (Federally qualified health center-look alike) in Dayton OH. FRHC is trying to minimize the organization's no show rate, maximize the clinical productivity and efficiently treat its underserved. The average rate of no show in FRHC ranged from 15 to 30%. In order to reduce the no show rate, FRHC implemented a Patient No Show and Termination policy (Policy code: AD 1.13) in March 2012. According to this policy, patients with a record of three no shows within one year period (beginning the date of the first no show) will be terminated from Five Rivers Health Centers.

After the second no show occurrence, FRHC sent notices to the patients explaining their missed appointment. The second notice included information about the consequences of three missed appointments in a one-year period and the option to discuss the "No Shows" with the FRHC Center. After the third no show, patients received a termination letter. If terminated, the

patients/guardians were required to attend an hour of no show reinstatement. Upon completion of the class, the patients were then be reinstated at FRHC.

Statement of Purpose

The primary objective of the study is to identify whether the implementation of Patient No Show and Termination policy at Five Rivers Health Centers is associated with a significant reduction of its no show rate. The secondary objective is to perform the best practices review on the no show policies of primary care clinics, multi-specialty clinics and other ambulatory health providers to determine which policy/policies have proven to be most effective in reducing the no show rates.

Literature Review

Effects of No Shows

No shows are one of the major problems for the healthcare organizations across US. Missed appointments adversely affect the providers, staffs, patients and the healthcare system itself. For a clinic, patient non-attendance effects staff utilization and provider productivity (Boyette & Sirois, 2011). With regards to patients, missed appointment slots could have been used for other patients who need immediate care. No shows are also an additional burden to the office staff since they must spend time to complete additional paper work due to the missed appointment and contact the patient to reschedule (Oppenheim et al., 1979). This results in loss of revenue for the healthcare organization.

In addition to causing administrative problems, missed appointments affect patients as it leads to loss of continuity of care. This in turn could cause a health risk that might eventually contribute to an increase in the emergency room visits or chronic conditions (Boyette & Sirois, 2011). A study of high risk diabetes patients found that a high no show rate is significantly

associated with the poor glycemic control. The adjusted mean Hemoglobin A1c of patients who missed more than 30% of scheduled appointments was 0.70 to 0.79 points higher ($P < 0.0001$) than those who were attending all appointments. Patients who missed more than 30% of their appointments were less likely to monitor their daily blood glucose and had poorer adherence to oral medicine refilling (Weingarten, Meyer, & Schneid, 1997). No shows also contribute to the reduced opportunity for other patients who need immediate care. All these indirectly lead to the rise in the healthcare costs (Pesata, Pallija, & Webb, 1999).

Demographic Factors Associated with No Shows

Multiple sociological and demographic factors are associated with no shows (Oppenheim et al., 1979). The demographic findings of no shows vary from one study to another with the variations attributable to differences in sample population, medical specialties, and geographic region (LaGanga & Lawrence, 2007). However, many studies found that the demographic and sociological factors such as age, social class and presence of health insurance are correlated with the no show rate (Oppenheim et al., 1979). A study conducted in a family medicine center found that younger patients, 20 to 39 years of age, were less likely to keep appointments (no show rate was 30.7%) whereas the older patients, between age 40 to 59 years and patients aged 60 years and over, were more likely to attended their scheduled appointments (no show rate of 40 to 59 years was 19.6%, 60 years and over was 9.1%) (Smith & Yawn, 1994). Certain types of medical insurance were also highly correlated with patient non-attendance. Patients with Medicare and Medicaid for example had a higher no show rate when compared to those with private insurance. The no show rate among people with traditional assistance was 29.5% and those with private insurance was 22%, the difference was statistically significant (Smith & Yawn, 1994). The study also found that no show rates are high among non-whites when compared to the whites

(Whites=24.2%, African Americans=41.7%, Hispanics=42.4%) (Smith & Yawn, 1994). However, similar studies did not find differences between patients based on race/ethnicity (Barron, 1980; Oppenheim et al., 1979). Smith and Yawn's (1994) study found no correlation between the sex of the patient and no show rate. The result was consistent with other similar descriptive studies (Smith & Yawn, 1994; Barron, 1980).

Another study conducted in a United Kingdom (UK) pediatric care setting found social class has significant impact on the no show rate. In this study the term social class is assessed using the definition of registrar general that includes five categories: Social class I – Professionals, II- Intermediate, III- Manual skilled and Non-manual skilled, IV- Semi-skilled, V- unskilled and unemployed. The study found a significant difference in the distribution of social class ($p < 0.03$). An increasing pattern of no show was seen in the social class (I to V) with social class V having the highest no show rate (No show rate ~50%) (McClure et al., 1996).

Other Factors Associated with Patient No Shows

Patients do not keep up their appointments for various personal and logistical reasons. An interview conducted using a focus group of patients who missed their appointments found that 29% of the patients had problems finding transportation, 19% of the patients had scheduling problems, 18% of the patients forgot their appointment, 10% of the patients had to miss their appointment to take care of a sick child or relative at home and 10% of the patients cited that they had problems finding childcare. Only about 4% of the patients cited financial problem as a reason for non-attendance (Campbell, Chez, Queen, Barcelo, & Patron, 2000). The result of the above mentioned study by Campbell, Chez, Queen, Barcelo, and Patron (2000) is consistent with other similar studies which are conducted across various healthcare settings (Boyette & Sirois, 2011; Oppenheim et al., 1979).

In addition to personal and logistical reasons, no shows are found to be correlated with length of the time between scheduling an appointment and the actual appointment date. Patients are more likely to miss their appointments when there is a longer time between the scheduling process and the appointment date. A study conducted on patients who missed their appointment showed that 67% of patient who had scheduled appointment four or five weeks early did not show up for their appointment. On the other hand patient group whose appointments were scheduled just two to four weeks in advance had a lower no show rate (no show rate = 44 to 55%) (Nazarian, Mechaber, Charney, & Coulter, 1974).

Appointment Reminder Strategies

In order to reduce no shows, hospitals and clinics either modify their appointment scheduling strategies or incorporate some form of appointment reminder strategies (Hasvold & Wootton, 2011). The two most commonly practiced appointment scheduling strategies used to reduce no shows are open access scheduling and overbooking appointments. Hospitals and clinics also incorporate appointment reminder strategies such as telephone reminders (automated or staff), text/short message services, exit interviews, electronic mail, open access scheduling, charging for missed appointments, and termination policies (Stubbs et al., 2012). Each of the following paragraphs explains in detail about the various appointment scheduling strategies and appointment reminder strategies.

Overbooking is a method of scheduling appointments where clinics book more than the actual number of patients they can accommodate. Overbooking is done with the expectation that some patients might not show up for their appointment. Overbooking has significantly improved patient access and provider productivity (Hasvold & Wootton, 2011). However, there are disadvantages to overbooking. Overbooking increases patient wait time and can require a

provider to work overtime (Hasvold & Wootton, 2011). A simulation experiment identified that overbooking appointments are highly effective only when used in clinics that provide care to large number of patients and that have a high no show rate (Hasvold & Wootton, 2011).

Open access scheduling is another appointment scheduling method used to reduce the no show rate. Under open access scheduling, patient appointments are not scheduled in advance. Patients receive same day appointment, irrespective of the urgency of their medical condition. Routine and follow-up appointments are also not made in advance. Implementation of open access scheduling in a pediatric setting found a significant reduction (21% in baseline to 9%) of no show from the baseline (O'Connor, Matthews, & Gao, 2006). The method has also improved operational efficiency and patient satisfaction (Parente, Pinto, & Barber, 2005; O'Hare & Corlett, 2004). There are some disadvantages in open access scheduling, the schedulers have to closely monitor the demand and also protect the providers by not overloading the schedules of particular doctors.

In order to remind patients about the scheduled appointment, clinics provide a telephone reminder one or two days before the scheduled date. Telephone reminders are of two types. One type can be a call made by the nursing staff or an appointment scheduler. The other type is an automated call. Since the automated call does not require staff time, it significantly reduces the administrative cost (Hasvold & Wootton, 2011). As a result, many healthcare organizations prefer to use automated calls to reduce no shows. However, little is known about the effectiveness of this type of strategy. Hasvold and Wootton (2011) conducted a study to compare the effectiveness of automated reminder strategy and calls made by staffs. The study identified that both staff and automated calls were much more effective than no calls (no-show rates when call was made by a staff was 13.6%, automated call was 17.3% and no call was

23.1%), however staff reminder system was found to be superior to automated calls ($p < .01$) (Hasvold & Wootton, 2011).

Exit interviews are the type of appointment reminder strategy that are used to schedule follow-up appointments for inpatient and outpatient care. During the exit interviews, patients' questions are addressed and they are further educated about their future appointments, no-show policies, transportation and urgent care access (Guse, Richardson, Carle, & Schmidt, 2003). Performing exit interviews has proven to be highly effective in improving the health literacy of patients and decreasing the no show rate (Boyette & Sirois, 2011). Implementation of exit interviews in a socio-economically challenged population resulted in a 29% reduction of the overall no show (Guse et al., 2003).

A mailed appointment reminder strategy is one of the oldest reminder methods. Patients receive a reminder card, a day or two prior to their appointment. The reminder card will contain information including the date, time and reason for the appointment. A study conducted in a pediatric service indicates that, about 64% of patients who received the reminder card kept their appointment compared to 48% of patients in the control group (no reminder card sent) (Nazarian et al., 1974). However mailed appointment reminder systems cannot be used in all circumstances and for all populations. In order to send a mailed appointment reminder, appointments have to be made 12 or more days in advance. It is also not recommended for patients who have low literacy or whose mailing address might change frequently (Guse et al., 2003).

Short text messages are another type of appointment reminder strategy that hospitals/clinics prefer the most (Guy et al., 2012). This method is quickly gaining in popularity because of the wide infiltration, convenience and directness of mobile phones (Guy et al., 2012).

Studies have found that sending short text messages to patients reduces labor cost compared to telephone or postal reminder system. While both SMS reminders and telephone reminders are equally effective, SMS reminders have been found to be significantly more cost-effective (Chen, Fang, Chen, & Dai, 2008).

Healthcare organizations sometimes charge a financial penalty for missed appointments. The effectiveness of charging fines has not been analyzed in the United States' healthcare settings; hence the range of the penalty is not clear. However a study conducted in a community mental health center found about 54% reduction in no shows after the introduction of a $30 no show fee (Lesaca, 1995). Another study conducted in UK found a 14% reduction of no show rate (fine amount not specified) (Mantyjarvi, 1994). However, it is also important to consider the administrative cost associated with charging fines. The administrative cost includes staff time, setting up accounting systems, postage and reminder cost (reminder to pay fine). The cost might be higher than telephone and short message systems (Bech, 2005). Critics argue that charging fines will be cost-effective only if it is highly effective in reducing no shows. A low effectiveness would contribute to a very high administrative cost (Bech, 2005). As a result, the method has both advantages and disadvantages in it.

Another intervention to reduce non-attendance is a termination policy and these can differ from one healthcare organization to another. In brief, a termination policy is the process of prohibiting patients from having future appointments at a clinic or a hospital after a certain number of non-attendances. Although the policy is followed by many healthcare organizations, the effectiveness of the policy is not widely assessed or reported.

The majority of the articles in this literature review reported that hospitals and clinics which serve younger patients and patients of lower social class have a very high rate of no

shows. Also, patients with government-provided insurance such as Medicare and Medicaid are more likely to miss their appointments. Patients provide various personal and logistical reasons for no shows. The reason varies from one study to another. The reason behind the variance could be attributed to the difference in healthcare setting, the type of specialty and the population. The literature review shows that modifying the appointment scheduling strategy and incorporating an appointment reminder strategy can reduce no shows. But it also important to note that all the reminder systems have both advantages and disadvantages. Hence there is no one generic method that can be followed by hospitals that would eliminate or reduce no shows. However the significantly high rate of no shows in many healthcare organizations increases the importance of being familiar with the common demographics factors and reasons behind patient no shows. Familiarity with the factors mentioned above will provide substantial knowledge to the healthcare organizations to tailor their appointment reminder strategy.

Methods

Analysis of Patient No Show and Termination Policy

The data for this study was obtained retrospectively from the electronic medical records of the seven clinical centers of Five Rivers. The seven centers of FRHC includes: (i) FRHC Centers For Women's Health, (ii) FRHC Family Practice, (iii) FRHC Infusion Clinic, (iv) FRHC Primary Care Ludlow, (v) FRHC Specialty Clinic Apple, (vi) FRHC Specialty Clinic Ludlow, and (vii) FRHC Specialty Clinic Surgery. The nurse staffs at FRHC tallied the number of no show appointments and number of completed appointments on a daily basis. The information was entered in the electronic medical records (EPIC) of FRHC. The Wright State University Internal Review Board recommended this study for exemption (see Appendix 1).

The data included the total number of completed appointments and the number of no shows for each month from May 2011 until December 2012. Since the no show policy was implemented in March 2012, the 10-month period from May 2011 to February 2012 was identified as the pre-implementation period and the 10 month period from March 2012 to December 2012 was post-implementation period.

Statistical analysis was conducted using Microsoft Excel and IBM Statistical Package for Social Sciences (SPSS) for Windows, version 20 (IBM, 2012). Using Microsoft Excel, two sets of columns were created one each for the number of no shows in the pre-implementation period (May 2011 to February 2012) and the post-implementation period (March 2012 to December 2012). Each of the seven FRHC clinics was set up in rows. Additionally, each individual clinic had two further variables comprised of a) total participants for that specific month who completed the appointment, and b) number of patients who did not show up to keep their appointment. For each of the clinics, the total number of completed appointments was added for each of the months before the implementation of the new policy. Similarly, the total number of no shows was counted for each month after the implementation of the new policy. In addition, the proportion of no show occurrences was calculated individually for each clinic. The numerator and the denominator for this calculation were the total number of completed visits by participants and the total number of no shows, respectively. Once this was completed, the individual rates for the seven clinics were added together to get a cumulative rate of no shows in the pre-implementation phase. In summary, at the end of this stage of the analysis, a cumulative no show rate for the 10-month pre-implementation phase was obtained. Applying the same methodology, the 10-month rate of no show was also calculated for the post-implementation phase.

These two rates were exported to SPSS and a Chi-squared test was used to test the statistical significance between the two categorical variables of pre- and post-implementation period, shows and no shows. Following the same methodology used for cumulative no show rates, chi-squared tests were used to calculate the no show rate for the pre and post implementation phases for each individual clinic separately.

Best Practices Review

To identify the policies that have been most effective in reducing the no show rates in clinics, a best practices review was performed using peer reviewed research studies. The domain of research articles was obtained by conducting a literature search from databases including PubMed, Medline and Google Scholar. This analysis focuses on studies that were conducted in US and published between 1990 and 2013. The following search terms were used: “no shows”, “non-attendance”, “patient compliance”, “reminder system”, “telephone reminders”, “postal reminders”, “electronic mail reminders” and “text messaging”.

Evidence-based public health practice is used in this study to determine the research studies to be included on the review. This process enables the use of best available scientific evidence to support the decision making process. Using the criteria provided by Brownson, Fielding, and Maylahn (2009) (Table 1) for public health practices, the studies were classified into strong evidence and weak evidence based on the level of scientific evidence used by each study. Evidence based and effectiveness studies were grouped under strong evidence while promising and emerging studies were grouped under week evidence. The type of establishment of the study is used as a major factor in the classification of strong and weak evidence.

1- Strong evidence - Scientific peer reviewed studies, evidence obtained through randomized controlled trials, cohort or case control analysis studies, and studies using research tested intervention programs, studies that found greater improvements on an outcome measure.

2- Weak evidence - Studies that are not peer reviewed, have reliance on self-reported data, and unmeasured difference between intervention and control group.

Table 1

Typology for Classifying Interventions by Level of Scientific Evidence

Category	**How Established**	**Consideration for the Level of Scientific Evidence**	**Data Source Examples**
Evidence-based	Peer review via systematic or narrative review	Based on study design and execution External validity Potential side benefits or harms Costs and cost-effectiveness	Community Guide Cochrane reviews Narrative reviews based on published literature
Effective	Peer review	Based on study design and execution External validity Potential side benefits or harms Costs and cost-effectiveness	Articles in the scientific literature Research-tested intervention programs (123) Technical reports with peer review
Promising	Written program evaluation without formal peer review	Summative evidence of effectiveness Formative evaluation data Theory-consistent, plausible, potentially high-reach, low-cost, replicable	State or federal government reports(without peer review) Conference presentations
Emerging	Ongoing work, practice based summaries, or evaluation works in progress	Formative evaluation data Theory-consistent, plausible, potentially high-reaching, low-cost, replicable Face validity	Evaluability assessments Pilot studies NIH CRISP database Projects funded by health foundations

Source: Brownson, Fielding, & Maylahn (2009)

Results

Analysis of Patient No Show and Termination Policy

The analysis found that the aggregate no show rate of FRHC clinics decreased from 29.3% during the pre-policy period to 26.6% during the post policy period (Table 2). This difference was a decrease of 10% and was statistically significant X^2 ($p < 0.001$).

Table 2

Comparison of Patient No Show Rates of Pre and Post Policy Implementation Periods for All Clinics in Aggregate

	Period		**P-Value**
	Pre policy	**Post policy**	
Shows	70.7%	73.4%	<0.001
No Shows	29.3%	26.3%	

In addition, the differences in no show rates from the pre policy period to the post policy period were calculated for individual clinics of FRHC (Table 3). With the exception of one clinic (FRHC Specialty Clinic Ludlow), there was a reduction of no show occurrences in the post-policy implementation period. FRHC Center for Women Health and FRHC Family Practice had the highest percentage difference of no show rate (12.3%). FRHC Specialty Clinic Surgery had the lowest percentage difference of no show rate (2.5%) (Table 3). The reduction was statistically significant ($p < 0.001$) in only four of those clinics (FRHC Center for Women Health, FRHC Family Practice, FRHC Primary Care Ludlow, and FRHC Specialty Clinic Apple).

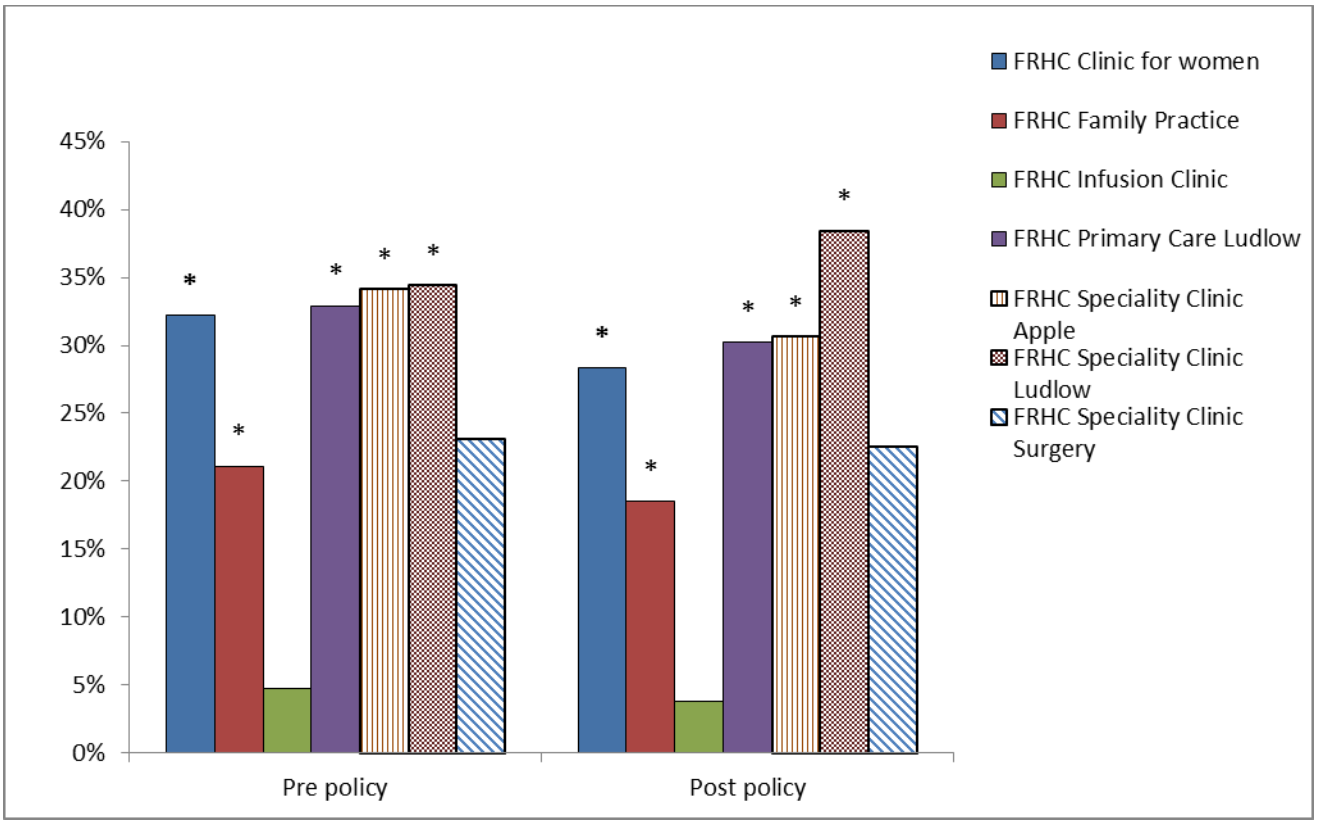
In contrast, to the others the no show rate of FRHC Specialty Clinic Ludlow increased from 34.4% during the pre-policy period to 38.4% during the post policy period. It was an 11.6% increase and was statistically significant ($p < 0.001$). The results are plotted in the graph (Figure 1) to facilitate the comparison of patient no show rates during the pre and post implementation period for the seven clinics of FRHC.

Table 3

Comparison of Patient No Show Rates of Pre and Post Policy Implementation Periods for Seven Clinics of FRHC

FRHC Clinics	**Pre-policy no show rate**	**Post policy no show rate**	**Percentage difference in no show rate from pre policy to post policy**	**p-value**
FRHC Center for Women Health	32.3%	28.3%	12.3%	<0.001
FRHC Family Practice	21.1%	18.5%	12.3%	<0.001
FRHC Infusion Clinic	4.7%	3.8%	19.1%	0.831
FRHC Primary Care Ludlow	32.9%	30.2%	8.2%	<0.001
FRHC Specialty Clinic Apple	34.1%	30.6%	10.2%	<0.001
FRHC Specialty Clinic Ludlow	34.4%	38.4%	-11.6%*	<0.001
FRHC Specialty Clinic Surgery	23.1%	22.5%	2.5%	0.759

Note: * 11.6% decrease



Note. *: P<0.05

Figure 1. *Comparison of patient no show rates of pre and post policy implementation periods for the seven clinics of FRHC.*

Best Practices Review

Only studies that met the inclusion criteria were considered for the best practices review. All included studies were classified into strong and weak evidence based on the level of scientific evidence used in the studies. The analysis of this literature found that the majority of the studies provided strong evidence. Of the nine strong evidence studies, seven were randomized controlled trial (RCT) (Experimental studies) and two were observational studies. RCTs are the gold standard of epidemiological studies because of its ability to control for possible confounders. This indicates that the results provide the most convincing evidence.

Table 4 shows the summary of the best practices review and categorizes them by type of appointment reminder strategies.

Telephone reminder.

There were 5 telephone reminder studies identified meeting the inclusion criteria (Table 4). Three studies demonstrated a decrease in no shows with telephone reminders but in only 2 were the improvements statistically significant (Christensen, Lugo, & Yamashiro, 2001; Hashim, Franks, & Fiscella, 2001) and 1 of unclear significance (Shoffner, Staudt, Marcus, & Kapp, 2007). One study reported no change (0.1%) (Irigoyen, Findley, Earle, Stambaugh, & Vaughan, 2000) while another randomized controlled trial performed in a pediatric clinic (low income) in New York City demonstrated a significantly higher no show rate. The no show rate in the cohort contacted by an automated system was 8.9% while the no show rate in the control group with no-reminder was 5.9% (Satiani, Miller, & Patel, 2009).

Study conducted by Hashim et al., show that significantly more number of patients cancel their appointments when they are called (Hashim et al., 2001). Those cancelled slots were used for the other patients who needed urgent care or same day appointment. Hence the additional revenue from the same day appointment offset the cost of telephone reminder (Hashim et al., 2001).

Mail/postal reminder.

There were three studies evaluating mail/postal reminder that met the inclusion criteria (Table 4). All three studies showed a reduction in no show rate. However only one paper showed statically significant reduction (Can, Macfarlane, & O'Brien, 2003) and two showed unclear significance (Irigoyen et al., 2000; Maxwell et al., 2001). The study conducted by Maxwell et al. showed no significant decrease in no show rate when comparing postcard

reminders or automated telephone reminder or no reminder. A randomized controlled trial (RCT) found a significant decrease in no shows rate when post cards reminders were combined with telephone reminders but the significance of post card reminders alone was unclear (Irigoyen et al., 2000). A separate RCT conducted by Can, Macfarlane, and O'Brien (2003) found that patients were significantly more likely to attend the appointment if they returned an appointment confirmation card than if they received a mailed reminder without a returned confirmation or received no reminder at all.

Other reduction strategies.

Only one study evaluating exit interviews met the inclusion criteria (Table 4). This was a prospective cohort study in which the intervention significantly reduced the odds of no show rate by 29% (Guse et al., 2003). Two studies meeting inclusion criteria showed open-access scheduling to be effective at reducing no show rate. Both the studies offered same day or immediate access to patients and found a substantial reduction in no show rate (Mallard, Leakeas, Duncan, Fleenor, & Sinsky, 2004; O'Connor et al., 2006).

To assess the efficacy of SMS/text messaging no peer reviewed articles were identified meeting the inclusion criteria.

Table 4. Summary of the Best Practices Review of the Appointment Reminder Systems

Reminder Systems	Author	Study design	Setting	Findings	Year
Telephone Reminder	Hashim et al.	RCT (S)	Urban family practice residency outpatient clinic	No-show rate decreased by 6.9%	2001
	Christensen et al.	RCT (S)	Pediatric dental clinic, primary Children's Medical Center, Salt Lake City, Utah	No- show rate decreased by 12.1%	2001
	Satiani et al.	Observational (S)	Vascular laboratory, academic U.S hospital	No show rate increased 3% in reminder group	2009
	Shoffner et al.	Prospective randomized interventional pilot study (W)	Appalachian Community mental health center	No Show rate decreased by 12%	2007
	Irigoyen et al.	RCT (S)	Urban pediatric clinic (low income), New York City	No show rate decreased by 0.1%	2000
Mail (postal) reminder	Maxwell et al.	RCT (S)	Women's Ambulatory low-income, inner city clinic	No show rate decreased by 3.2%	2001
	Irigoyen et al.	RCT (S)	Urban pediatric clinic (low income), New York City	No show rate decreased by 6.7%	2000
	Can et al.	RCT (S)	Orthodontic clinic	No show rate decreased by 4.2%	2003
Exit Interview	Guse et al.	Prospective cohort study (S)	Family practice center	No show rate decreased by 5.2%	1996
Open access scheduling	O'Connor et al.	Cluster randomization compared with baseline (Control) group (S)	Community health center pediatric clinic, Colorado	No show rate decreased by 11.8% on average with open access vs. control	2006
	Mallard et al.	Pilot study with baseline control (W)	Jefferson County, Alabama, Department of Health Clinic	No show rate decreased by 24%	2004

Note: S – Strong Evidence, W- Week Evidence

Discussion

There are many limitations in the evaluation of the Patient No Show and Termination Policy. During the data collection process, the nurse staff did not record the number of appointments cancelled by the patients. Only those appointments which were cancelled by the physicians were recorded. Although this study provides a quick picture of the effects of the Patient No Show and Termination Policy, the internal validity of the study is questionable. In addition, since there was no control group, the observed change cannot be fully attributed to the Patient No Show and Termination Policy. The difference in the outcome could have been caused by systemic error in the study.

This best practice review has several limitations. The differences in patient population – age, gender predominance, geographic setting, type of healthcare specialty and other factors limit the comparability of the studies. It is important to note that none of the studies included in the review control for socioeconomic status. Since low socioeconomic status independently predicts no shows, the unavailability of more expensive communication technologies to people of low socioeconomic status introduces potential bias (Hamilton, Round, & Sharp, 2002).

Overall the patient attendance at FRHC clinics improved during the post-implementation period of the Patient No Show and Termination Policy. The steps followed in the Patient No Show and Termination Policy could have contributed to the decrease in the no show rate. Following the second no show, FRHC sent notices to the patients explaining their missed appointment. The second notice included information about the consequences of three missed appointments in a one year period and the option to discuss the “No Shows” with the FRHC Center. After the third no show, patients received a termination letter. If terminated, the patient/guardian was required to attend an hour long no show reinstatement class; the termination

would stand until the class was completed. The reinstatement class provided information such as: the consequences of no shows, cost of no shows, ways the lost money could be made up, how to set an appointment, how to cancel an appointment and information about public transportation. The objective of the policy was to confront patients with the knowledge about no shows and its consequences. The above mentioned efforts of FRHC could have in part or fully contributed to the overall reduction of the show rate. Though the clinic had experienced a significant improvement in the attendance rate, the healthcare administrators of FRHC were not completely satisfied with the performance of the policy. As result of this evaluation and the best practices review, they are looking to make further changes in their no show policy.

The results of the best practices review found that all reminder strategies appear to decrease patient non-attendance at a moderate rate with no show rates reduced by 10% to 15%. When considering the technology penetration and efficacy, telephone reminders and SMS reminders prove to be a good mode of appointment reminder system. This is consistent with previous studies which identified that telephone and text-messaging reminders were accepted by a large majority of patients (Junod Perron et al., 2013). Cost analysis of reminder systems shows text messaging to be most cost-effective type of appointment reminder. However our evidence-based knowledge on SMS/text messaging method of appointment reminder strategy is limited due to the lack of studies examining SMS/test messaging reminders in US. Most of the peer reviewed studies that assessed the SMS/text messaging reminder systems were conducted in United Kingdom and China. While the results might not be representative of a US clinic, the majority of these international studies found that SMS/text messaging was associated with significantly lower no show rate (Stubbs et al., 2012). However, its applicability is limited by

the technology penetration and age of the patients (Stubbs et al., 2012). Unlike SMS reminders, phone calls reminders are useful and available for both landlines and cellphones.

Another significant finding is that, telephone reminders by a staff member are more effective than automated telephone reminders. Specifically, verbal human contact with the patients 48 hours before the appointment played a significantly role in the reduction of patient nonattendance. This is consistent with another study which identified direct personal contacts with patients as slightly more effective than automated phone calls to reduce patient nonattendance in an academic outpatient practice (Junod Perron et al., 2013).

One of the most common reasons patients provide for not showing up for the appointment is forgetfulness due to the length of the time between scheduling an appointment and the actual appointment date. Studies showed that providing a telephone reminder 48 hours before the appointment helps patients to overcome the problem of forgetfulness. Another advantage of implementing a telephone reminder is that, it helps appointment cancellation when the patient cannot attend. These cancelled appointments create time slots, which could be used for patients who need a same day appointment.

In summary, this study suggests that FRHC could implement a comprehensive approach in addition to the Patient No Show and Termination policy. The comprehensive approach would be to combine the telephone reminder strategy and the open access scheduling to fill the cancelled appointments that are established from the telephone reminders. It is also important to note that the best practices review identified that telephone service is not available to everyone. An exit interview could be incorporated to reach the segment of patients who do not have access to telephone service. The nurse staff could provide information about future appointment and collect information about patients' preferable mode of appointment reminder. This

comprehensive approach may help in the reduction of patient no show and also increase the productivity of the clinic.

It would also be beneficial to conduct observational studies in this specific population in order to understand the reason behind the patient non-attendance. The reason for patient no shows will differ from one clinic to the other. So it is important for every clinic to analyze the reason behind their patients' non-attendance. Understanding the reasons for no shows will help the healthcare administrators tailor the appointment reminders based on characteristics of the patients. In the future it would be advantageous to analyze the effectiveness of any future strategy by incorporating a control group which will help in assessing the internal validity of the study. The indirect public health implication of addressing patient no shows is the corresponding improvement in the regularity of wellness checkup, vaccination rates for children and continuity of patient care obtained for those with chronic disease. This implies appointment reminder strategies likely have a positive effect on the health and well-being of many different patients.

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Appendix 1: IRB Exemption Letter

WRIGHT STATE UNIVERSITY

Office of Research and Sponsored Programs
201J University Hall
3640 Col. Glenn Hwy.
Dayton, OH 45435-0001
(937) 775-2425
(937) 775-3781 (FAX)
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DATE: November 6, 2013

TO: Maalinii Vijayan, PI, Graduate Student
Community Health, Center for Global Health
John McAlearney, Ph.D., Faculty Advisor

FROM: B. Laurel Elder, Chair
WSU Institutional Review Board

SUBJECT: SC# 5325
'No Shows: Effectiveness of Termination Policy and Review of Best Practices'

At the recommendation of the IRB Chair, your study referenced above has been recommended for exemption. Please note that any change in the protocol must be approved by the IRB; otherwise approval is terminated.

This action will be referred to the Full Institutional Review Board for ratification at their next scheduled meeting.

NOTE: This approval will automatically terminate two (2) years after the above date unless you submit a "continuing review" request (see http://www.wright.edu/rsp/IRB/CR_sc.doc) to RSP. You will not receive a notice from the IRB Office.

If you have any questions or require additional information, please call Robyn Wilks, IRB Coordinator at 775-4462.

Thank you!

Enclosure

RESEARCH INVOLVING HUMAN SUBJECTS

SC# 5325

ACTION OF THE WRIGHT STATE UNIVERSITY
EXPEDITED REVIEW
Assurance Number: FWA00002427

Title: 'No Shows: Effectiveness of Termination Policy and Review of Best Practices'

Principal Investigator: Maalinii Vijayan, PI, Graduate Student
Community Health, Center for Global Health
John McAlearney, Ph.D., Faculty Advisor

The Institutional Review Board Chair has approved an exemption with regard to the use of human subjects on this proposed project.

REMINDER: Federal regulations require prompt reporting to the IRB of any changes in research activity [changes in approved research during the approval period may not be initiated without IRB review (submission of an amendment), except where necessary to eliminate apparent immediate hazards to subjects] and prompt reporting of any serious or on-going problems, including unanticipated adverse reactions to biologicals, drugs, radioisotope labeled drugs or medical devices.

B Raud Elder, Ph.D.

Signed Chair, WSU-IRB
Approval Date: November 06, 2013
IRB Mtg. Date: November 18, 2013

Appendix 2: List of Tier 1 Core Public Health Competencies Met in CE

Domain #1: Analytic/Assessment
Identify the health status of populations and their related determinants of health and illness (e.g., factors contributing to health promotion and disease prevention, the quality, availability and use of health services)
Describe the characteristics of a population-based health problem (e.g., equity, social determinants, environment)
Use methods and instruments for collecting valid and reliable quantitative and qualitative data
Identify sources of public health data and information
Recognize the integrity and comparability of data
Identify gaps in data sources
Adhere to ethical principles in the collection, maintenance, use, and dissemination of data and information
Describe the public health applications of quantitative and qualitative data
Collect quantitative and qualitative community data (e.g., risks and benefits to the community, health and resource needs)
Use information technology to collect, store, and retrieve data
Describe how data are used to address scientific, political, ethical, and social public health issues
Domain #2: Policy Development and Program Planning
Gather information relevant to specific public health policy issues
Describe how policy options can influence public health programs
Explain the expected outcomes of policy options (e.g., health, fiscal, administrative, legal, ethical, social, political)
Gather information that will inform policy decisions (e.g., health, fiscal, administrative, legal, ethical, social, political)
Identify mechanisms to monitor and evaluate programs for their effectiveness and quality
Demonstrate the use of public health informatics practices and procedures (e.g., use of information systems infrastructure to improve health outcomes)
Apply strategies for continuous quality improvement
Domain #3: Communication
Communicate in writing and orally, in person, and through electronic means, with linguistic and cultural proficiency
Solicit community-based input from individuals and organizations
Participate in the development of demographic, statistical, programmatic and scientific presentations
Domain #4: Cultural Competency
Incorporate strategies for interacting with persons from diverse backgrounds (e.g., cultural, socioeconomic, educational, racial, gender, age, ethnic, sexual orientation, professional, religious affiliation, mental and physical capabilities)
Recognize the role of cultural, social, and behavioral factors in the accessibility, availability, acceptability and delivery of public health services
Domain #5: Community Dimensions of Practice
Recognize community linkages and relationships among multiple factors (or determinants) affecting health (e.g., The Socio-Ecological Model)
Demonstrate the capacity to work in community-based participatory research efforts
Identify stakeholders
Collaborate with community partners to promote the health of the population
Maintain partnerships with key stakeholders
Domain #6:Public Health Sciences
Identify the basic public health sciences (including, but not limited to biostatistics, epidemiology, environmental health sciences, health services administration, and social and behavioral health sciences)
Describe the scientific evidence related to a public health issue, concern, or, intervention
Retrieve scientific evidence from a variety of text and electronic sources
Discuss the limitations of research findings (e.g., limitations of data sources, importance of observations and interrelationships)
Describe the laws, regulations, policies and procedures for the ethical conduct of research (e.g., patient confidentiality, human subject processes)
Partner with other public health professionals in building the scientific base of public health
Domain #7: Financial Planning and Management
Adhere to the organization's policies and procedures
Report program performance
Translate evaluation report information into program performance improvement action steps
Demonstrate public health informatics skills to improve program and business operations (e.g., performance management and improvement)
Domain #8: Leadership and Systems Thinking
Incorporate ethical standards of practice as the basis of all interactions with organizations, communities, and individuals
Participate with stakeholders in identifying key public health values and a shared public health vision as guiding principles for community action
Identify internal and external problems that may affect the delivery of Essential Public Health Services
Use individual, team and organizational learning opportunities for personal and professional development
Participate in the measuring, reporting and continuous improvement of organizational performance
Describe the impact of changes in the public health system, and larger social, political, economic environment on organizational practices