

# 2021\_TR\_04 Lero Technical Report

# Literature review analyzing research on Do-Not-Attend (DNA) factors at health care clinics

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# Abstract

**Background:** Non-attendance at health care clinics/workshops has been a long-standing problem. The increasing costs in the administration and overhead of patients over the last few years resulted in increased research in this area. The non-attendance results in inefficiencies in health care and should be addressed.

Aim: To identify the factors associated with non-attendance at health care clinics/workshops.

**Method**: A literature review was carried out to identify, evaluate and interpret existing research. The review was carried out based on Kitchenham and Charters guidelines.

**Results:** The findings from the Systematic literature review are summarized and tabulated using data synthesis. The results show that non-attendance at health care clinics is influenced by multitude of factors categorized as personal, clinical, practitioner and clinic/hospital.

**Conclusion:** The factors identified can be used as a means to improve the attendance at health care clinics. However, the factors associated with non-attendance are multitude and complex. Hence, a range of methodologies should be followed to effectively reduce it.

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# 1. Introduction

Non-attendance in health-care clinics is a long-standing problem and one of the common reasons for inefficiency in the health care system. In 2015, the health care system of Ireland reported that one out of every six patients failed to attend the hospital appointments made. These failed appointments account for 15 per cent (500,000) of the total outpatient appointments made. Even in chronic illness clinics like Cancer care the non-attendance rate is at 7 per cent (Cullen, 2016). This has resulted in over €20 million in administrative costs and a continuing rise in waiting lists in the Irish Health Service Executive (HSE). Despite heavily funded initiatives to reduces the numbers, the HSE reported more than 476,000 DNAs in 2017 (Cahill, 2018). To address this non-attendance, it is important to understand the factors contributing to patients failed appointments.

Many research studies have stated that non-attendance increases the cost of care, decreases the appointments available, increases the wait time of appointments and wastage of resources since highly trained professional staff and advance equipment were under-utilized. However, the most worrisome effects of non-attendance is the poor health status of patients since failure to keep the appointments lead to missing the chance for prevention, intervention, and continuity of care and pose greater risk of re-admission to the hospital. Researchers have also identified that non-attendance in chronic disease clinics can increase patient morbidity. For example, evidence from the studies suggest that diabetes patients who failed to keep up with their clinic appointments have poorer glycemic control and other related complications.

Workshops and rehabilitation programs held to support chronic illness patients were also found to have significant outcomes. For example, there are widely accepted results of reduced mortality and incidence of adverse cardiac events with patient's participation in Cardiac rehabilitation (CR) programs. Despite the documented benefits for patients, the majority of patients choose not to participate in these programs.

A critical analysis on 'do-not-attends' (DNAs) is necessary to reveal significant insights and create strategies to mitigate the non-attendance. The purpose of this research study is to identify the factors associated with non-attendance at hospitals and workshops with a focus on chronic disease clinics. Hence, the existing published empirical literatures about non-attendance to chronic illness workshops and clinics are analysed, and from this, factors contributing to DNAs are summarised.

# 2. Research method

This systematic literature review was undertaken following guidelines proposed by Kitchenham and Charters (Kitchenham et al., 2007). This method allows us to identify, evaluate and interpret the existing research in a structured manner, thus avoiding bias as far as is possible.

### 2.1 Review protocol

The literature review (LR) protocol is a written plan that specifies all the methods or activities that are undertaken as part of the review process. It is undertaken to decrease researcher bias in selection and analysis of the research studies. The steps in the LR protocol used in this study are detailed in the following sub-sections.

### 2.2 Research Questions

The research questions addressed by this study are:

- Research Question 1 (RQ1): What are factors contributing to non-attendance at health care clinics and workshops?
- Research Question 1 (RQ2): What are the methods used to reduce non-attendance at health care clinics and workshops.

To address the above Research Questions, published academic and grey literature are explored.

### 2.3 Search Process

The search process used was a manual search for journal papers conference proceedings and grey literature. Databases explored are listed in Table 1, with relevant papers which addressed non-attendance at healthcare clinics and workshops identified.

| Source                      | URL                               |
|-----------------------------|-----------------------------------|
| IEEE Explore                | http://Ieeexplore.ieee.org        |
| PubMed Central (PMC)        | https://www.ncbi.nlm.nih.gov/pmc/ |
| CSIRO publishing            | https://www.publish.csiro.au/     |
| SAGE journals               | https://journals.sagepub.com/     |
| Europe PMC                  | https://europepmc.org/            |
| Wiley Online Library        | https://onlinelibrary.wiley.com/  |
| The British Medical Journal | https://www.bmj.com/              |
| BMJ Journals                | https://journals.bmj.com/         |
| ScienceDirect               | https://www.sciencedirect.com/    |
| SpringerLink                | https://link.springer.com/        |

 Table 1 - Literature Sources

### 2.4 Study selection

Articles published on the following topics were included in the study:

- Factors effecting the non-attendance rate at health-care clinics and workshops
- Ways to reduce non-attendance associated with health-care clinics and workshops.

The following were the criteria for excluding the articles:

- Papers not written in English
- Duplicate articles of the same study
- Publications not related to the research questions.

The abstract of each article was studied and evaluated based on the above inclusion and exclusion criteria to determine whether or not to include it in the study. In cases where it was not possible to decide based on the abstract, the full article was read to evaluate the inclusion and exclusion criteria. When the article was published in more than one conference or journal, the journal or conference with complete version of the article is considered.

#### 2.5 Data Extraction

For the data extraction phase, we designed data extraction forms on MS Access to support the collection and analysis of the required data to answer the research questions. In addition to that data, standard information about articles such as title, author, publication details were recorded. See Table 2 for fields extracted to answer RQ1, and Table 3 for fields extracted to answer RQ3.

| Data Field          | Description   |
|---------------------|---|
| Title               | Name of the research article                                  |
| Author              | Authors of the research article                               |
| Publication Source  | Where is the research article published                       |
| Publication type    | Is the published article a Journal paper or conference paper? |
| Year of Publication | In which year the article is published?                       |
| Research process    | Research methods used in the study.                           |
| Research sample     | The population or sample group used in the study.             |
| Research questions  | What is the motivation for the study?                         |
| Findings/Results    | Main findings of the study.                                   |

Table 2 - Extracted fields for selected studies: used to answer RQ-1

| Data Field          | Description   |
|---------------------|---|
| Title               | Name of the research article                                  |
| Author              | Authors of the research article                               |
| Publication Source  | Where is the research article published                       |
| Publication type    | Is the published article a Journal paper or conference paper? |
| Year of Publication | In which year the article is published?                       |
| Research process    | Research methods used in the study.                           |
| Research sample     | The population or sample group used in the study.             |
| Research questions  | What is the motivation for the study?                         |
| Intervention        | Strategy used to reduce the non-attendance.                   |
| Findings/Results    | Main findings of the study.                                   |

Table 3 - Extracted fields for selected studies: used to answer RQ-2

#### 2.6 Data Synthesis

Data synthesis process involves gathering and summarizing the findings of the studies to address the research questions posed in the early stages. The initial research question that guided this study was to identify factors that are associated with non-attendance at health care clinics and workshops. To address this research question, non-attendance factors identified in selected studies were extracted using descriptive (narrative) synthesis. Descriptive synthesis involves tabulating extracted information from the selected studies such that they align with the research question. The second research question is to identify methods to reduce the non-attendance at hospitals/clinics. Descriptive synthesis was used to extract the information including interventions methods used and the effects of this intervention.

### 3. Results

#### 3.1 Summary of the selected studies: RQ-1

Research Question 1 (RQ1): What are factors contributing to non-attendance at health care clinics and workshops?

The extracted data from the selected studies including sample groups, research methods and factors identified are presented in Table 4.

| Authors         | Sample Groups              | Research method            | Factors associated        |
|-----------------|----------------------------|----------------------------|---------------------------|
|                 |                            |                            | with do not attend        |
|                 |                            |                            | figure                    |
| Frankel et al.  | 112 attenders and 162      | Questionnaire.             | - Thinking treatment      |
| (1989)          | non-attenders at a         |                            | unnecessary,              |
|                 | General hospital, UK.      |                            | - On holiday,             |
|                 |                            |                            | - Difficulties in getting |
|                 |                            |                            | - Feeling unwell          |
| Bottomley et al | 54 non-attenders at a      | Prospective study          | - Forgot                  |
| (1994)          | district general hospital. | Trospective study.         | - Felt normal             |
| (1))            | UK.                        |                            | - Illness                 |
|                 |                            |                            | - Lack of communication   |
|                 |                            |                            | with clinic.              |
| Cooper et al.   | 152 patients registered    | Qualitative study:         | - Older age               |
| (1997)          | to a cardiac               | - Questionnaires           | - Less aware of their     |
|                 | rehabilitation.            | - Statistical analysis     | health problems           |
|                 |                            |                            | - Less likely to be       |
|                 |                            |                            | influenced away from      |
|                 |                            |                            | prior beliefs.            |
| Woodward        | 85 attenders and 68        | Qualitative study:         | - Forgetting              |
| (1998)          | non-attenders from         | - Questionnaires           | - Difficulty getting off- |
|                 | asthma clinic in the       |                            | time at work.             |
|                 | south-west of England.     |                            | - Perception of the       |
|                 |                            |                            | asthma as mild            |
|                 |                            |                            | - Administrative errors   |
| Pal et al.      | 983 non-attenders at       | - Questionnaire            | - Forgetting              |
| (1998)          | two NHS Trust              |                            | - Illness                 |
|                 | hospitals.                 |                            | - Transport problems      |
|                 |                            |                            | - Short notices           |
| Murdock et      | 73 non-attenders at a      | - Postal and telephone     | - Forgotten their         |
| al. (2002)      | Gastroenterology           | questionnaires:            | appointment,              |
|                 | outpatient clinic, NI.     |                            | - Illness,                |
|                 |                            |                            | - Change of job and       |
|                 |                            |                            | location                  |
| Farley et al.   | 51 non-attenders to        | Qualitative study:         | Top 5 most cited          |
| (2003)          | Cardiac rehabilitation     | - Questionnaire listing    | reasons:                  |
|                 | at a suburban hospital     | possible reasons for their | - I feel I can deal with  |
|                 | in Adelaide, Australia.    | non-attendance.            | it by myself.             |
|                 |                            | - Patients could list      | - Don't have transport    |
|                 |                            | additional reasons.        | - Don't want to dwell     |
|                 |                            |                            | on the problem            |
|                 |                            |                            | - Don't teel              |
|                 |                            |                            | comfortable talking in    |
|                 |                            |                            | groups                    |
| 1               | 1                          |                            | - Loo tar to travel       |

| (2003) - Survey questionnaire - Forgetting,<br>- Unaware of the              |    |
|--|----|
| (2003) Information of the - Unaware of the                                   |    |
|  |    |
| Australia  |    |
| - Too sick,  |    |
| - No parking,  |    |
| - Too long to see a  |    |
| doctor   |    |
| Coodin et al 342 outpatients Quantitative study: - Younger age               |    |
| (2004) diagnosed of - Data collected from - Substance use                    |    |
| schizophrenia outpatient clinic - Lower scores on the                        |    |
| - Life Skills Profile (LSP) responsibility and                               |    |
| - Statistical analysis social contact subscale                               | Э  |
| of the LSP   |    |
| Benoit et al. 69 type-2 diabetes Oualitative study: - Clinical indicators    |    |
| (2004) patient's data from - Diabetes electronic including blood             |    |
| Project Dulce, a disease management system pressure and                      |    |
| management program (DEMS) software. hemoglobin A1c.                          |    |
| in San Diego County - Case control study - Smoking                           |    |
| USA - Logistic regression  |    |
| Williams et al 11 recipients of Oualitative study: - Difficulty in travel    |    |
| (2004) implantable - Interviews - Not want to be                             |    |
| (2004) Implaitable Interviews reminded of problem                            |    |
| La filmillatan fram Sin Descriptive  |    |
| defibriliator from Sir - Descriptive - Toung patients                        | ,  |
| Charles Gairdner unought groups mostry                                       |    |
| Hospital.  |    |
| Cashman et al. 465 adult patients in an Quantitative study: - Depression     |    |
| (2004) Urban Community - Prospective study - Anxiety/Panic attack            | S  |
| Health Center, USA Linear regression   |    |
| Scott et al. 75 patients in a Quantitative/Qualitative: - Time constraints   |    |
| (2005) diabetes clinic in - Questionnaire/Survey                             |    |
| Canada Interviews  |    |
| Van Baar et al.12 attenders and 7- Interviews- Memory lapses,                |    |
| (2006) non-attenders at a - Poor health and                                  |    |
| outpatient asthma - Disillusionment with                                     | 1  |
| clinic, UK the structure of  |    |
| outpatient care  |    |
| Johnston et al. 6495 attenders and Quantitative study: - longer waiting time |    |
| (2006) non-attenders at public - telephone interviews                        |    |
| specialist outpatient - administrative databases                             |    |
| centers in Hong Kong - Questionnaire   |    |
| Lehman et al. 206 patients of a Swiss Quantitative study: - Young age.       | -  |
| (2007) chronic disease clinic Ouestionnaire - Not understanding th           | ie |
| - Chi-squared univariate need for the  |    |
|  |    |
| analysis apointment  |    |

| Casey et al.   | 76 non-attenders at a    | Quantitative study:      | - Poor health             |
|----------------|--------------------------|--------------------------|---------------------------|
| (2007)         | urology outpatient       | - Telephone survey       | - Administrative error    |
|                | clinic in UK.            |                          | - Perceived no need for   |
|                |                          |                          | appointment.              |
| Neilsen et al. | 145 patients at a        | Quantitative study:      | - Live alone,             |
| (2008)         | Danish cardiac clinic.   | - Patient charts         | - No complaints of        |
|                |                          | - Hospital register      | chest pain,               |
|                |                          | - Bivariate analysis     | - Older than 60           |
|                |                          | - Multiple Logistic      |                           |
|                |                          | Regression               |                           |
| Fischer et al. | 217 patients in a        | Quantitative study:      | - Administrative errors   |
| (2009)         | pulmonary                | - Questionnaire          | (Appointment              |
|                | rehabilitation course in | - Medical records        | Cancellations, wrong      |
|                | Netherlands.             | - Descriptive statistics | planning, therapist       |
|                |                          | Ĩ                        | absent)                   |
|                |                          |                          | - Medical reasons         |
|                |                          |                          | - Other activities like   |
|                |                          |                          | birthday holidays,        |
|                |                          |                          | attending funerals,       |
|                |                          |                          | taking care of ill family |
|                |                          |                          | member.                   |
| Lilley et al.  | A sample of 49 people    | Qualitative study:       | - Difficult to attend the |
| (2010)         | attending psycho-        | - Questionnaires         | workshop due to other     |
|                | educational workshops    | - Mean scores            | practical issues          |
|                | addressing mental        |                          | - Forgot about the        |
|                | health disorders like    |                          | workshop                  |
|                | depression and anxiety.  |                          | - Difficulty in doing     |
|                |                          |                          | things with strangers     |
|                |                          |                          | - Lack of time            |

 Table 4 - Summary of selected studies for RQ1.

From the literature review, non-attendance at chronic disease workshops and clinics is highly influenced by a multitude of factors that can be categorized into *personal factors, clinic factors* and *practitioner factors*.

#### **Personal Factors**

Most of the research studies identified were focused on the personal and clinical factors of patients to address the non-attendance issue. However, the results seem to be mixed and have contradicting results with others. For example, the study conducted by Williams et al. (2004) and Lehman et al. (2006) revealed that younger people are more likely to not attend. Other research studies conducted by Neilsen et al. (2008) and Cooper et al (1997) shows that older people especially those aged over sixty (60) are more likely to not attend. This shows the lack of consistency between the research findings.

Farley et al. (2003) conducted a study to investigate the reasons for non-attendance of patients to Cardiac rehabilitation. Forty-five of the 51 non-attenders completed the survey reporting the

reasons for their non-attendance. In addition to practical factors, this study also addresses the personal factors associated with non-attendance. The most commonly cited reasons for non-attendance are 'can deal with myself', 'no transport' and 'don't want to dwell on the problem'.

Benoit et al. (2004) conducted a control study to identify factors such as demography, clinical and behavioral that influence patients' attendance at a San Diego Diabetes program. The results revealed that patients with clinical conditions like high blood pressure and hemoglobin would have a high chance of not attending. The research done by Cashman et al. (2004) at an urban community health centre affirms that health status of the patients, in particular, their psychological health that include depression and panic/anxiety attack has a strong correlation with missing appointments. However, this study is limited in scope and lacks generalizability since it considers only one community health centre.

Fischer et al. (2009) conducted a study on patients attending a pulmonary rehabilitation program to examine the causes for drop-out and non-attendance associated with the program. There are many reasons responsible for the patient's non-attendance that include medical issues (9%), activities like taking care of other ill persons, funeral attending (15%), some activities performed that patients are not comfortable with (2%) and some patient's skipped since they have a long time between appointments or have only one appointment on the given day.

Lilley et al. (2010) studied on withdrawal and non-attendance rates at psycho-educational workshops in South Gloucestershire Primary Mental Health Service, UK. The study findings for non-attendance were mostly personal reasons like difficulty attending, forgetting, difficulty in doing things with strangers and lack of time.

#### **Clinic Factors**

Although most of the research studies attribute the non-attendance to personal factors, there are some research studies identifying that clinical factors like clinic/workshop timings, delivery of programs and administration errors also impact the attendance rate. For example, the study conducted by Johnston et al. (2006) on 6495 attenders and non-attenders at public specialist outpatient centers in Hong Kong shows that non-attendance is attributable to "long time to see practitioner or to get appointment". Administration errors like ineffective scheduling of appointments that include appointment cancellations, wrong planning, therapist absent is also cited as a reason for non-attendance by Fischer et al. (2009).

The location of the clinic/workshop and its access to transport was also found to influence the attendance rate. Two studies (Williams et al. (2004), Farley et al. (2003) cited difficulty in transport to the clinic as a reason for the non-attendance.

#### **Practitioner Factors**

In the case of these studies, the 'practitioner' is the healthcare professional or the clinician. From the research studies, it is evident that the clinic/workshop staff's interactions with the people of chronic illness has a significant impact on patient's attendance. Authors like Woodward et al. (1998) attributed non-attendance at the clinic to lack of optimal communication between the practitioner and the person with the chronic illness, creating a not so serious perception of the disease and hence patients get the impression that appointment are not essential. Woodward

pointed this out by showing that the patients that were told they were having 'mild' asthma, most likely missed the next appointment.

Researchers like Farley et al. 2003 noticed that the missed appointments are mostly follow-up appointments rather than being first time appointments. He attributed this to lack of proper communication between health care practitioners and patients, in particular regarding their illness condition and the importance of their attendance for follow-up appointments. These negative relationships between patients and healthcare practitioners or clinic staff can have a consequent negative effect on a patient's attendance at clinics.

#### 3.2 Summary of the selected studies: RQ-2

Research Question 1 (RQ2): What are the methods used to reduce non-attendance at health care clinics and workshops.

Eleven (11) studies have been identified which support answering RQ-2. The details of the studies including study sample, Research design, Intervention and Findings are summarized in Table 5.

| Authors                  | Study sample   | Intervention   | Research<br>Design                                       | Effects of<br>Change  |
|--------------------------|--|--|--|---|
| Hardy et al.<br>(2001)   | 325 new patients<br>in a diabetes clinic<br>compared to<br>previous 1336<br>previous records<br>from same clinic.                      | Patients were sent<br>were sent a packet<br>with appointment<br>information 2 weeks<br>before appointment<br>patients and 1 week<br>before appointment | Prospective,<br>non-<br>randomized,<br>controlled study. | Non-<br>attendance<br>rate was<br>reduced to<br>4.6% from<br>15%. |
| Haynes et al.<br>(2006)  | 515 outpatient<br>appointments of a<br>pulmonary<br>function<br>laboratory.  | Telephone<br>appointment-<br>reminder calls  | Retrospective<br>review                                  | Non-<br>attendance<br>was reduced<br>by 6.9%.                     |
| Maxwell et<br>al. (2001) | 2,304 patients<br>were randomly<br>assigned to one of<br>three groups:<br>Telephone<br>reminder, Postcard<br>reminder, no<br>reminder. | Postcard reminder,<br>Telephone reminder.  | Randomized<br>control trial.                             | Non-<br>attendance<br>was reduced<br>by 2.1%.                     |
| Roberts et al. (2007)    | 504 patients of<br>Respiratory<br>outpatient clinics,<br>London, were<br>allocated to the<br>telephone reminder                        | Call reminder  | Randomized<br>control trial<br>(RCT)                     | Non-<br>attendance<br>was reduced<br>by 7.1%.                     |

|                            | group and control group.  |   |   |  |
|----------------------------|---|---|---|--|
| Chen et al.<br>(2008)      | 1,859 participants<br>randomly assigned<br>into 3 groups:<br>control (no<br>reminder) group,<br>SMS text<br>messaging<br>reminder group<br>and telephone<br>reminder group. | (SMS) text<br>messaging and<br>phone reminder | Randomized<br>control trial.                    | Non-<br>attendance<br>reduced by<br>7.8%.  |
| Rusius et al.<br>(1995)    | 144 patients at a psychiatric out-<br>patient clinic.   | Postal reminders                              | Randomized<br>control study,<br>Students t test | Non-<br>attendance<br>rate was<br>reduced to<br>13% from<br>28%.   |
| MacDonald<br>et al. (2000) | 686 patients at a<br>Mental health care<br>center, New<br>Zealand.  | Telephone<br>reminders                        | Controlled<br>prospective<br>study              | Non-<br>attendance<br>rate was<br>reduced by<br>20%.   |
| Swenson et<br>al. (1988)   | 150 subjects from<br>a community<br>mental health<br>center.  | Postal reminders                              | Randomized<br>control trial.                    | Difference of<br>26% between<br>control group<br>and<br>experimental<br>group (postal<br>reminders).                 |
| Lee et al.<br>(2003)       | 161 patients<br>attending a<br>endoscopy unit,<br>general hospital,<br>Dublin   | Telephone<br>reminders.                       | Observational<br>Study.                         | Non-<br>attendance<br>rate declined<br>from 23.3%<br>(observation<br>period) to<br>5.7%<br>(intervention<br>period). |
| Kluger et al.<br>(1983)    | 141 callers to the<br>Adult Outpatient<br>Clinic to book an<br>appointment.   | Orientational<br>statement.                   | Randomized<br>control trial.                    | Non-<br>attendance<br>rate was<br>reduced to<br>27% from<br>56%.   |

| Jayaram et | 1433 patients at an | Prompt letters | Randomized     | Non-       |
|------------|---------------------|----------------|----------------|------------|
| al. (2008) | outpatient clinic.  |                | control trial. | attendance |
|            |                     |                |                | rate was   |
|            |                     |                |                | reduced to |
|            |                     |                |                | 17% from   |
|            |                     |                |                | 27%.       |

 Table 5 - Summary of selected studies for RQ2.

### **Telephone reminders**

Among the selected studies, seven (7) studies (Hardy et al. 2001, Haynes et al. 2006, Maxwell et al. 2001, Roberts et al. 2007, Chen et al. 2008, Lee et al. 2003, MacDonald et al. 2000) measured telephone reminder effectiveness. The phone calls were usually made within one to three days prior to appointment. They were made by clinic staff or practitioner who spoke directly to the patient in most cases.

A randomized control study was conducted by Maxwell et al. 2001, Chen et al. 2008 and Roberts et al. 2007 by assigning patients into either a control group or experimental group. The experimental group received a telephone remainder 1-3 days prior to the appointment. Two studies found a significant decrease in non-attendance rate of up to 7-8% between the control group and intervention group, while Roberts et al. 2007 study found only a 2% decrease. MacDonald et al. conducted a prospective control study and revealed that telephone remainders made 24 hours before appointments are effective in reducing the DNA rate. The control group non-attendance rate was 24% (121/496) while the contacted group had a rate of 5% (9/191) which is a significant reduction.

Lee et al. 2003, investigated the non-attendance rate of 161 patients attending to endoscopy unit at a general hospital in Dublin. It was an observational study conducted over a period of total four months (two months for the observation period and two months for the intervention period). The intervention of a telephone remainder seemed to be effective, since it reduced the non-attendance rate from 23.3% in observation period to 5.7% during the intervention period. Haynes et al. 2006 did a retrospective review on the effectiveness of telephone reminders on a hospital-based pulmonary laboratory data over a period of eight months. The study revealed that patients who were reminded about their appointments via telephone were less likely to miss them. Also, it found no difference in the DNA rate between telephone (direct) reminders and messages.

#### **Postal reminders**

Four studies (Swenson et al. 1988, Rusius et al. 1995, Hardy et al. 2001, Jayaram et al. 2008) investigated the effect of postal reminders on the DNA rate at various health care centers. All the studies sent a standard postal reminder i.e. a letter with appointment and clinic details. The reminders were usually sent a week to 3-days before the appointment. The Swenson et al. 1988, study compared the effectiveness of prompt letters and orientational letters sent 1-3 days before the appointment. Although the experiment groups have less DNA rate than control groups, the significant difference is only seen with group that were sent orientational reminders one day before the appointment when compared with the control group, 17% [5/30] vs. 43% [13/30].

Randomized control studies were conducted by Rusius et al. (1995) and Jayaram et al. (2008) to measure the effectiveness of postal reminders in reducing the DNA rate at out-patient clinics. The studies sent prompting letters about appointment details to the patients one week before the appointment and found that the DNA rate was significantly reduced after the intervention.

Hardy et al. investigated the combined effectiveness of postal reminders along with call reminders. The study incorporated the strategy of sending a packet with the appointment and clinic information two weeks before the appointment, followed by a call a week before the appointment to confirm the receipt of the pack and confirming the appointment. The study showed a noticeable difference in non-attendance rate, which reduced the overall DNA rate from 15% (201/1336) to 4.6% (15/325).

#### **Orientation statements**

There is one study by Hardy et al. that compared the effectiveness of orientation statement and phone calls. The subjects were randomly assigned to control group and experiment groups (orientation statement and phone calls). The orientation group were read a 30-second orientation statement after their appointment was scheduled and phone call group patients received a phone prompt before the appointment. The findings showed that only the orientation statement group (28%) had a significant reduction in DNA rate when compared to the control groups.

# 4. Conclusion

This review shows that patients fail to attend clinic appointments for a variety of factors. More than half of the selected studies reported forgetting about the appointment as one of the factors. Such factors can be avoided by providing reminders about the appointment to the patients. Patient-practitioner relationship and inadequate communication between the patient and practitioner have also been reported as one of the reasons for non-attendance in multiple studies. Thus, effective communication between the patient and practitioner of patient needs can help to improve attendance.

We hope that this report will support healthcare staff and clinicians in being aware of the wide variety of issues that result in non-attendance.

Much of the research regarding improving attendance in hospitals/clinics has focused on the reminding patients about the appointments. The reminders are either by telephone or by letter. Although this reduced non-attendance by a significant amount in many cases, it is not the only factor contributing to non-attendance. The research studies also showed that other groups of people are more likely to not attend than others, in particular, those who are employed (and thus have to look for time off), and those who do not their own means of transport.

Literature shows that attention also needs to be paid to factors such as clinic accessibility (for example, is the clinic accessible on a public transport route?), clinic timings (for example, are timings flexible for patients?). Further research is needed to improve our understanding on the health system factors and develop any strategies to address them. Since there are a range of factors that result in non-attendance, multiple strategies are needed to address and improve the attendance at health care clinics.

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