Clinical Research

Title

"Nonattendance in health services: can it be an opportunity for improvement?".

Research Team

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Abstract

The management and quality control of different services in the health department imply the monitoring of several variables.

The absence from health appointments is a problem referred by numerous studies around the world, affecting both patients and, from an organizational perspective, health facilities and their professionals. The nonattendance of patients may negatively influence their clinical results, due to loss or delay in follow-up regarding their pathologies. However, this absence may have a direct beneficial impact on the normal function of health facilities given that these absences may account for more time and therefore reduce appointment delays. The aim of the present work is to create a prediction model of unattendance to previously scheduled appointments. Its pertinence is justified by the fact that unattendance appears to be one of the variables that influence the quality of health services.

The need to create this model arises from the attempt to avoid delays in attendance and aim for the greatest time-efficiency of the health professionals, towards satisfactory gain for both health professionals and health services' users.

A retrospective study was conducted with multivariate exploratory data analysis of a random sample (n = 616), anonymized, of booking vacancies in a working week, during the final quarter of 2018, in a Family Health Unit (USF), part of the Group of Health Centers of Baixo Vouga (ACeS BV*)*. A logistic regression model was estimated in which the unattendance of scheduled appointments is a function of a set of predictors, using software R 3.4.2, in Mac OS 10.14.

This study comprises the following variables: i) dependent variable - absences (0,1); ii) predictors - appointment category (t_cs: SA = adult health, FP = family planning, RO = cancer screening, SI = child health, SM = maternal health, HTA = hypertension surveillance, DM = diabetes surveillance), scheduling category (t_ag: M = doctor, E = nurse, U = patient, Y = user via internet) and scheduling time (h_ag: 8-20h).

In the 616 scheduled appointments, there were 54 absences. Of these, based on category, family planning and cancer screening had the highest percentage of absences, 35.7% and 18.2% respectively. Concerning scheduling category, booking through the internet (Y) had the highest absence rate (25%). The highest absolute number of total absences was verified at 9:00 am; the highest absence rate for booked appointments occurred at 5:00 pm (16.7%) whilst the lowest absence rate was at 2:00 pm (1.6%). This is due to the fact that the amount of available and fulfilled booking slots at 5:00 pm is inferior to that at 9:00 am. Graphical representation of absence rate per hour showed a bimodal distribution.

Based on the proposed model, no significant difference was found between the results predicted by the model and those observed in the sample (Hosmer-Lemeshow test, Xsq = 11.359, df = 8, p = 0.1822). Therefore, the usage of this model as a classifier is acceptable (AUC = 0.726, IC95% = [0.646-0.806]).

According to the model, the predictive nonattendance for a given schedule is: probability = 1/[1+exp(-z)], where z = -1,930 +0.009*(tipo_ag = M) -0.281*(tipo_ag = U) +1.321*(tipo_ag = Y) +0.439*(t_cs = HTA) +2.308*(t_cs = PF) +1.517*(t_cs = RO) +0.343*(t_cs = SA) +0.526*(t_cs = SI) +0.464*(t_cs = SM) -0.076*(h_ag) and exp (x) is the natural exponential function of x.

Based on the analysis of scheduled appointments, we conclude that nonattendance, despite being a loss for the user, may help reduce overall appointment delays. Thus, this predictive model may serve as an advantage to achieve optimal appointment schedules.

Based on the collected data (preliminary data from a more thorough model that includes other parameters), with all variables from the present model kept unchanged, we conclude that absences will tend to most likely occur in two appointment categories: family planning (OR = 10, IC95% = [3.17, 39.3]) followed by oncologic/cancer screening (OR = 4.6, IC95% = [0.55, 28.8]). Nonattendance at family planning appointments is, therefore, 10 times more likely to occur than other appointments.

In order to improve scheduling, this data may be used in one of two scenarios: i) family planning appointments may be allocated to those periods of the day when delays are most likely to occur, allowing for nonattendance to make up for any lost time and/or ii) apply measures that may help reduce nonattendance.

This study helped clarify the distribution of absence rates to scheduled appointments and is part of a greater quality control project that involves other models, namely one based on a queuing theory and another related to delays on scheduled appointments.

Keywords

Absence; nonattendance health services quality; appointment scheduling