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Original Article

Application value of information management mode in special outpatient service and its influence on appointment success rate

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Abstract: Objective: To study the application value of information management mode in special outpatient service and its influence on the success rate of appointment. Methods: The information management mode was applied in May 2018 in The First Hospital of Jilin University. Before that, the traditional mode was used. The patients were collected as the control group (CG) three months before the implementation of the information management mode (January-March 2018), and the patients in the research group (RG) were enrolled three months after the implementation (January-March 2019). The statistical reservation service data of the two groups were compared, and each group of 200 patients were randomly selected in the above-mentioned time period for telephone follow-up. The reservation, registration service, nursing staff service attitude, doctor service attitude, reservation time, registration time, and inspection time, total satisfaction with the medical environment, waiting time, triage accuracy rate, and outpatient complaint rate of the two groups were compared. Results: The success rate of the information management mode in January-March 2019 was higher than that of the traditional mode in January-March 2018. The waiting time of patients of RG was shorter than that of CG, the correct triage rate of RG was higher than that of CG, and the outpatient complaint rate of RG was also lower than that of CG ($P<0.05$). The follow-up of patients showed that the patients' total satisfaction with their appointment, registration service, service attitude of nursing staff, service attitude of the doctor, time of appointment and registration and examination, and medical treatment environment after the information management mode was higher than that before intervention ($P<0.05$). Conclusion: The application value of the information management mode in special outpatient service is significant, which can improve the success rate of patient appointment and satisfaction.

Keywords: Information management, special outpatient service, applied value, appointment success rate

Introduction

Relevant studies believe that special outpatient service can ensure the requirements of special patients, thus providing them with high-quality services, which has better diversification and higher level of patient service [1]. Special outpatient service has strict requirements on the diagnosis and treatment by doctors and the nursing service, because often patients are also prone to dissatisfaction during the treatment process [2]. The traditional outpatient management mode has a noisy environment and long waiting time, which easily increases conflicts between doctors and patients and increases the occurrence of risk adverse events [3]. Outpatient information management is a modern new business technology. Information quality is the foundation and key of outpatient scientific management [4]. Relevant research points out that the outpatient information management mode not only optimizes the treatment process, but also improves the patient's treatment environment, shortens the waiting time, reduces the risk of adverse events, greatly improves the service quality and work efficiency of the outpatient service, saves labor and cost, alleviates the psychological pressure of nurses at work, and improves the main management mode of the hospital outpatient service [5]. This study aimed to study the application value of informa-

tion management mode in special outpatient service and its influence on the success rate of appointments.

Materials and methods

Research participants

The information management mode was applied in May 2018 in The First Hospital of Jilin University. Before that, the traditional mode was used. In this article, patients who made appointments in the Department of Special Medical Services of The First Hospital of Jilin University from January to March 2018 before intervention were selected as the control group (CG), and patients who made appointments in the Department of Special Medical Services of The First Hospital of Jilin University from January to March 2019 after intervention were selected as the research group (RG). From the above two time periods, 200 patients in each period were randomly selected for telephone follow-up, with a total of 400 cases. There were 232 males and 168 females, aged 16-70 years with an average age of (48.8±5.7) years. The CG consisted of 120 males and 80 females with an average age of (48.5±5.8) years. There were 112 males and 88 females in the RG, with an average age of (47.9±6.0) years. The patients and their families in this study have signed the informed consent form. The study was approved by the Ethics Committee of The First Hospital of Jilin University.

Methods

Management mode: The CG followed the traditional mode of management, including appointment/registration → queuing → seeing a doctor → queuing → paying the fee → queuing → examination/inspection → seeing a doctor again → paying the fee again → taking medicine → treatment → leaving hospital/hospitalization.

The RG followed an information management mode: (1) In-hospital, out-of-hospital, online or offline multi-channel modes were applied. Centralized registration windows, special service reservation windows, and self-service machine reservation were applied according to the actual needs of patients. Patients could also directly go to the doctor's workstation for reservation. Telephone, WeChat public number, PDA App and other methods were applied out-of-hospital for registration. It was required that the source of monthly development appointment for special outpatient service in The First Hospital of Jilin University was 100%. (2) The queuing and calling process was optimized, and the system would automatically allocate patient queues to realize scientific queuing. The data interface of the calling process was integrated with HIS, and the database information was shared. Hardware devices such as LED screens, television, and voice broadcast were used to provide real-time display of patient queue dynamics and diagnosis and treatment information, so as to timely call patients for treatment or make preparations. Special outpatient nurses could carry out re-calling and number-crossing operations in the clinic, and at the same time the nurses could query various information of patients. For patients from other provinces, on-site follow-up appointment could be made. (3) The self-service system was improved and multiple applications for self-service equipment in the outpatient area were established. Self-service printing for inspection and examination reports and other self-service equipment were established in special outpatient clinics. (4) WeChat and Alipay self-service machine scan code payment, bank card self-service machine payment, WeChat public number, and mobile phone App real-time payment were applied. Information such as patient inspection and examination results and medical examinations were synchronized with WeChat public number, mobile phone App and other equipment, which are convenient for patients to use.

Statistics of appointment success rate and survey of satisfaction: The relevant data of outpatient real-name reservations were collected, and the reservation number and reservation success rate of telephone reservation, online reservation and on-site reservation were compared (reservation success rate = actual reservation number/reservation number × 100%). Telephone follow-up of patients was conducted, and multi-directional evaluation was conducted in terms of appointment, registration service, and service attitude of nursing staff, service attitude of doctor, appointment time, registration time, examination time, and medical treatment environment. Each item was scored 20 points, with a total score of 100 points. A score

Table 1. Comparison of general data of research participants (($\bar{x}$ ± sd), n, %)

Group	Control group (n=200)	Research group (n=200)	t/χ^2	P
Average age (years)	48.5±5.8	47.9±6.0	1.017	0.310
Male/female (case)	120/80	112/88	0.657	0.418
Non-local/local (case)	30/170	32/168	0.076	0.782
Self-paid (case)	112	120	0.657	0.418
Initial visit/re-visit (case)	155/45	160/40	0.373	0.541

of 80-100 points indicated that patients were very satisfied, 60-80 points indicated that patients were satisfied. A score of <60 points indicated that the patient was not satisfied. Total satisfaction = (number of very satisfied + number of satisfied)/total number of patients.

Service effect statistics: The patients of the two groups were followed up by telephone and asked about their waiting time (0-20 minutes, 20-40 minutes, more than 40 minutes). Triage accuracy rate = triage correct number/triage number × 100%, outpatient complaint rate = outpatient complaint number/outpatient visit number × 100%.

Statistical methods

SPSS 20.0 was used for analysis. The counting data were represented by percentage, the comparison among groups applied χ^2. The measurement data were expressed by mean ± standard deviation ($\bar{x}$ ± sd). The comparison between the two groups applied independent sample t test. At P<0.05, the difference was statistically significant.

Results

Comparison of general data of research participants

As shown in **Table 1**, there was no significant difference (P>0.05) between the two groups in gender ratio, average age, non-local/local, self-paid, initial visit/re-visit, and as such the two groups were comparable.

Influence of information management mode on appointment success rate of special outpatients

As shown in **Table 2** and **Figure 1**, the number of appointment patients in January, February and March with the information management mode was more than that with the traditional mode in January, February and March respectively (P<0.01). The success rate of the information management mode in 2019 was higher than that of the traditional mode in 2018 respectively (P<0.01).

Influence of information management mode on satisfaction of outpatients with special needs

As shown in **Table 3**, patients' satisfaction was evaluated from the aspects of appointment, registration service, service attitude of nursing staff, service attitude of doctor, appointment time, registration time, examination time, and medical treatment environment. The total satisfaction of the RG was higher than that of the CG in all aspects (P<0.05).

Influence of information management mode on service effect of outpatients with special needs

As shown in **Table 4**, the waiting time of patients in the RG was shorter than that in the CG, the correct triage rate in the RG was higher than that in the CG, and the outpatient complaint rate in the RG was lower than that in the CG (P<0.05).

Discussion

In recent years, as people have higher requirements for the quality of life, enhanced self-protection and health care awareness, and higher requirements for outpatient service of medical service institutions, medical services have become more diversified. The main services of special outpatient services are special groups. Personalized and high-quality nursing services for patients are helpful for improving the medical treatment experience of patients [6, 7]. The improvement of management mode of special outpatient service can avoid the occurrence of weak links, problems and reveal hidden obstacles in the original service process, optimize the process and carry out all-round improvement, which is helpful to meet the needs of patients in all treatment aspects and promote the improvement of service quality and diagnosis and treatment technology [8, 9].

Table 2. Comparison of success rate of appointments for special outpatients between information management model and traditional model (n, %)

Group	Control group	Research group	χ^2	P
January				
Phone appointment	939/1512 (62.10)	1401/2002** (69.98)	24.023	0.001
Online appointment	614/1056 (58.14)	980/1097** (89.33)	129.061	0.001
On-site appointment	1039/1677 (61.96)	1640/1803** (90.96)	412.485	0.001
February				
Phone appointment	750/1155 (64.94)	1629/2173** (74.97)	37.222	0.001
Online appointment	655/1008 (64.98)	1492/1658** (89.99)	250.067	0.001
On-site appointment	1025/1578 (64.96)	1515/1665** (90.99)	323.45	0.001
March				
Phone appointment	1489/2204 (67.56)	2214/2767** (80.01)	100.164	0.001
Online appointment	1494/2055 (72.70)	2689/2952** (91.09)	298.028	0.001
On-site appointment	1288/1885 (68.33)	2002/2177** (91.96)	366.54	0.001

Note: Compared with the control group, **P<0.01.

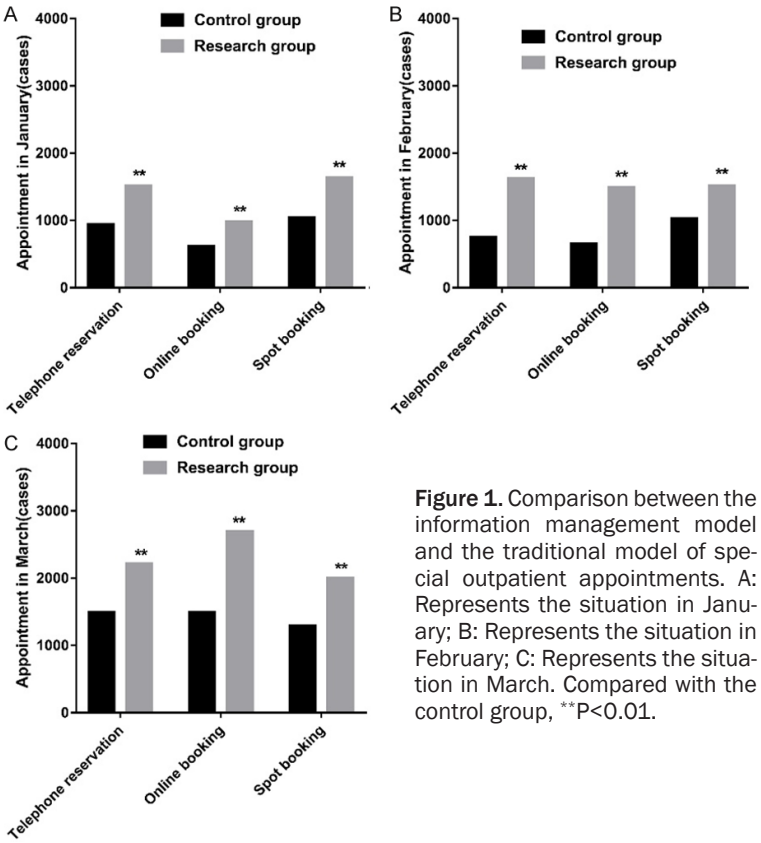

Figure 1. Comparison between the information management model and the traditional model of special outpatient appointments. A: Represents the situation in January; B: Represents the situation in February; C: Represents the situation in March. Compared with the control group, **P<0.01.

Outpatient information is a needs improved conditions for outpatient process optimization. In this study, we optimized the outpatient process, took patients as the center of treatment, fully considered patients' psychological needs and subjective evaluation, re-integrated the existing "bottleneck" on the basis of changing concepts and business strategies, changed the management mode, shortened the waiting time of patients, and improved the rate of hospital visits per unit time, thus achieving better economic and social benefits [10-12]. In this study, self-service system and self-service machine scanning code payment were adopted to improve the information management services to ensure the implementation of information construction to the greatest extent. Through the Internet, the scientific and normative outpatient process was applied, and patient satisfaction was improved, thus improving the comprehensive service level of outpatient service and promoting the better development of care in the hospital [13, 14].

The results of this study showed that the success rate of appointment in the RG was increased, which indicated that the information management mode could significantly improve the success rate of appointment for patients with special outpatient service. Some studies have pointed out that the key to the smooth development of reservation registration service is to ensure the

Table 3. Comparison of patient satisfaction between information management model and traditional model (n, %)

Group	Appointment, registration service	Service attitude of nursing staff	Service attitude of doctor	Appointment time, registration time, examination time	Medical treatment environment
Control group (n=200)					
Very satisfied	100 (50.00)	110 (55.00)	100 (50.00)	102 (51.00)	101 (50.50)
Satisfied	84 (42.00)	75 (37.50)	79 (39.50)	78 (39.00)	80 (40.00)
Dissatisfied	16 (8.00)	15 (7.50)	21 (10.50)	20 (10.00)	19 (9.50)
Total satisfaction	184 (92.00)	185 (92.50)	179 (89.50)	180 (90.00)	181 (90.50)
Research group (n=200)					
Very satisfied	114 (57.00)	126 (63.00)	100 (50.00)	120 (60.00)	124 (62.00)
Satisfied	80 (40.00)	70 (35.00)	90 (45.00)	72 (36.00)	68 (34.00)
Dissatisfied	6 (3.00)	4 (2.00)	10 (5.00)	8 (4.00)	8 (4.00)
Total satisfaction	194 (97.00)	196 (98.00)	190 (95.00)	192 (96.00)	192 (96.00)
χ^2_1/P_1	1.970/0.160	2.646/0.104	0.000/1.000	3.280/0.070	5.374/0.020
χ^2/P	4.640/0.030	6.470/0.011	3.940/0.044	5.200/0.020	4.530/0.026

Note: χ^2_1/P_1: the statistical value of very satisfactory; χ^2/P: the statistical value of total satisfaction.

Table 4. Comparison of patient service effect between information management model and traditional model ($\overline{x}$ ± sd, n, %)

Group	Control group (n=200)	Research group (n=200)	t/χ^2	P
Waiting time of patients (min)	40.30±10.20	20.50±5.10	24.55	0.001
Correct triage rate (%)	190 (95.00)	200 (100.00)	10.256	0.001
Outpatient complaint rate (%)	11 (5.50)	1 (0.50)	8.591	0.003

sufficient supply of reservation number sources. If there are not sufficient reservation number sources in the reservation process, it does not work effiently [15, 16]. Some patients far away from home mainly make appointments by telephone. When patients from other provinces need regular follow-up, the next follow-up appointment is usually confirmed in the hospital on the same day after this visit, and the follow-up appointment is completed on site [17, 18]. In this study, the application of information management mode in special outpatient service can improve the arrangement of the patient's schedule and help the patient to see a doctor within a better time window so as to save the patient's time.

Research by Hua et al, revealedthat the main problems facing the special outpatient service at present are insufficient publicity and great difficulty in making appointments, especially for the elderly patients who do not use online appointments and are restricted by traditional registration habits [19]. Registration is an important part of the outpatient process. If it is difficult for the patient to que, it will affect the patient's satisfaction [20]. In this study, by optimizing the queuing and calling process and adopting various payment methods, such as WeChat, Alipay, bank cards and mobile phone App real-time payment, the total satisfaction of patients in the RG on their appointment, registration service, nursing staff service attitude, doctor service attitude, appointment time, registration time, inspection time, and medical environment was higher than that in the CG, indicating that the information management mode could improve patient satisfaction in special-needs outpatient services. This was consistent with the research results of Pingling et al [21].

The results of this study pointed out that the waiting time of the patients in the RG was shortened, indicating that the information management mode could significantly shorten the time from registration to treatment in the application of special outpatient services, which was related to the reasonable arrangement of the treatment time of the patients in this study.

Yingfen et al also believed that high-quality service in special outpatient service could also greatly shorten the waiting time for patients to see a doctor [22]. In this study, the RG had a higher triage accuracy rate and a lower outpatient complaint rate, which showed that the application of information management mode could improve triage accuracy rate and reduce outpatient complaint rate. This study is not a parallel control study, and there is no statistical analysis on the accuracy rate of the patients. It is necessary to further expand the sample size or conduct a randomized control study.

To sum up, the application value of information management mode in special outpatient service is significant, which improves the success rate of patient appointments and the satisfaction degree of patients. It is of great significance and has a high value in clinical promotion and application.

Disclosure of conflict of interest

None.

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