

A Comparison Study of Patients Satisfaction Rate of Registry System in Two Referral Hospitals Emergency Settings

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Abstract

Background

Patient satisfaction is an indirect indicator essential for evaluating the quality of care services and accurate predictor of health system policies. Recently, predictor factors affecting patient satisfaction are at the center of attention as well. The main objective of this study is to assess patient satisfaction rate during registry procedure in the emergency department of two referral hospitals.

Methods

An analytical cross-sectional study was conducted in both academic hospitals with high volume of patient admission in Tabriz-Iran and Erzurum-Turkey. We used a Press Ganey questionnaire as a data collection tool. Each patient or related companion filled out the self-administered questionnaire including 18 questions before discharging or referring to other area. Eventually, data were analyzed by using SPSS software version 16.

Results

Overall, 462 respondents were enrolled in this survey during three part-time courses including morning shift (122 patients), evening shift (112 patients) and night shift (228 patients). 48.92% of participants were male and 51.08% were female. Our results demonstrated that total satisfaction score in new (model) registry system was two scores higher than classic one ($p < 0.001$). Furthermore, our findings showed a correlation between satisfaction rate and level of education and living place. In fact, patients with moderate education level in urban areas had higher satisfaction rate compared with rural regions (16 ± 3.53 vs. 14.93 ± 3.76 ; $P = 0.003$) and higher/lower education levels (16.3 ± 3.35 vs. 15.27 ± 3.71 and 15.67 ± 3.86 ; $p = 0.03$).

Conclusion

Take together attempts at improving patient flow as well as satisfaction rate in emergency department could reduce hospital costs and improve the quality of health care.

Introduction

Since the emergency department (ED) is represent the largest area of hospital admissions, overcrowding and subsequent delays in its throughput almost have important consequences and poorer outcomes during central triage such as uncertainty in ED, boarding of admitted patients, hospital longer stays, inaccessibility to appropriate hospital beds and lost opportunities to access on-time patients care services [1, 2]. Besides possible health effects, ED has a socio-economic impact following admission delays. Upon arrival to the emergency department, patients are first sorted by acuity in order to prioritize

individuals requiring urgent medical intervention which called “triage” and routinely performed by one of expert hospital staff according to patient’s chief complaint, demographic characteristics, and vital signs. Then, the patient should be visited by a medical provider who makes the initial care plan and finally recommends a disposition. Emergency medical management emerges as a professional discipline in the field of modern medicine and considered as an essential portion of primary care [3]. The initial identification of a medical emergency and subsequent management help medical system to save the patient’s life, prevent irreversible outcomes and unintended consequences [4]. On the other hand, modification of registry system is interesting strategy for both admitted and discharged patients. Hitherto, there are different management strategies related to ED, such as long-term waiting caused by unreasonable factors, the unbalance operation of physicians and nurses and so on [5]. Additionally, registration is one of the critical management issues in the ED setting [6]. The Main purpose of registration process is patient reliable identification to ensure the information obtained following entering historical data in the Hospital Information System (HIS) for better diagnostic accuracy [7]. The second factor is thought to be timeliness which plays an important role in determining of patient satisfaction so that lengthy registration affects the patient safety and care and a large number of patients are frustrated by waiting long time in ED [8]. Additionally, the survey results showed a low satisfaction rate by patient companions after spending more time in registration queues [9]. Recently, He et al. designed an optimized registration process by using allocated resources based on system simulation for reducing waiting time in the emergency department of West China Hospital [5]. Another research also demonstrated that alternative admission policies by different physicians improved the registration system and reduced waiting times [10]. Up to the present time, there is little evidence in regard to patients satisfaction rate during registry procedure. Therefore, in this study we aimed to compare the satisfaction rate of central registry (classic) and local registry in each area (model) for timely triage to minimize delays in admission services and increase expected satisfaction rate. Regarding the lack of documented clinical research to evaluate different registry implementation in Iran, the results of this study could improve the quality of management issues in emergency medicine and other health care systems.

Methods

Study design and patient population

Tabriz and Erzurum are climatically and culturally similar. Nevertheless, the registry process in the ED settings is different. That’s the reason we enrolled referral hospitals ED from Tabriz and Erzurum for a comparison study. An analytic cross-sectional study was conducted on 462 patients who referred to ED of Imam-Reza and Bölge tertiary hospitals in Tabriz-Iran and Erzurum-Turkey respectively with high patient volumes and approximately 400 to 600 daily visits. The survey research method was used to estimate the satisfaction rate of admitted subjects who randomly assigned by Excell software in different time courses (morning, evening, night) in the ED of both hospitals.

Patient satisfaction related questionnaire

This study will empirically collect patient questionnaire related to different areas (wards) of ED. By using a new registration system known as model registration at Erzurum hospital, we evaluated precisely demographic characteristics as well as time-related parameters and the efficiency of model registration. Then, the results were compared with the former registration system at Tabriz Imam-Reza hospital. The structured, pre-tested Press Ganey questionnaire was filled out by one of the hospital staff during a face-to-face interview. The subjects who were willing to participate in this study interrupted the interview only to clarify a question if required, but they did not reveal any information about the questions. The inclusion criteria included all randomized patients who referred to the ED and were triaged and the exclusion criteria consisted of all patients who quit the ED for any reason other than admission or discharge.

Statistical analysis

In this study, along with demographic characteristics, the satisfaction score of all patients and waiting times for classic and model registration systems were compared. Results were reported as a percentage and mean \pm standard deviation (SD) for qualitative and quantitative variables, respectively. Qualitative variables between two different systems were analyzed by Pearson Chi-square test. Univariate analysis was used to compare the mean of satisfaction score on the levels of independent variables by using independent t-test and Analysis of Variance (ANOVA). Linear regression models fitted data for evaluation of the factors affected satisfaction score. Those variables that had a p-value less than 0.2 in univariate analysis were entered into the regression model. Our data were analyzed by using SPSS software version 16 (SPSS Inc., Chicago, IL, USA). The p values less than 0.05 were considered as statistically significant.

Results

A total of 462 ED visits were participated in the current study, 199 (43.1%) and 263 (56.9%) patients were admitted through classic and model registry system, respectively. Demographic characteristics of all individuals during two different registry systems are fully explained in **table 1**. As shown in figure 1, the mean age of the patients was 44.32 ± 22.27 (0-94 years old) in both methods. Based on our evaluation, the average satisfaction score increased significantly in model registry system compared to the classic system (16.41 ± 3.23 vs. 14.66 ± 3.9 ; $p < 0.001$; **Figure 1**). The results of univariate analysis are shown in **table 2**. Based on Pearson's correlation coefficient, the relationship between satisfaction score and Age ($\rho = -0.18$), time for first visit ($\rho = -0.18$), time for any area transferring ($\rho = -0.18$), time for register ($\rho = -0.18$) and time for decision ($\rho = -0.18$) were statistically significant (**Table 2**; $p < 0.001$). To assess the quality of model and classic registry systems, the analysis of different time courses of first visit, area transferring, time for registration and final decision was performed. Based on our findings, the requested time for first visit and area transferring were significantly prolonged in classic registry system (**Table 3**, $p < 0.001$). Although the times of registration and final decision extended longer in model method, however the satisfaction score of model registry system was approximately two scores higher than classic method which directly refers to the quality of registration (**Table 3**, $p < 0.001$). Results of the multivariable logistic regression analysis to calculate the effect of independent variables on satisfaction score are presented in **table 4**. According to the results of regression modeling, some variables including methods of registry,

first admission, time of first visit, time for register and time for final decision had significant effects on average changes of satisfaction score (**Table 4**, $p < 0.001$). As shown in table 4, the average satisfaction score in patients who admitted during the model registry, was higher (1.8 unit) than classic method ($\beta = 1.80$, $p < 0.001$). Moreover, the average satisfaction score for patients who referred to ED for first time was 0.85 more than patients referred with more than once visit (**Table 4**, $\beta = 0.85$, $p < 0.001$). Linear regression modeling also determined that prolonged time for first visit, register and final decision, the satisfaction score decreased significantly. The results of satisfaction score of inter-group comparison for each method are shown in table 5. Based on independent *t*-test analysis, the statistically significant differences were observed in classic and model methods related to some variables such as time of visit and who is completing (**Table 5**, $p < 0.05$). However, admission shift for both methods was significantly different ($p < 0.001$). Interestingly, the highest satisfaction rate was observed in the morning shift (**Table 5**, $p < 0.001$).

Discussion

Patient satisfaction is the extent to which patients are satisfied and pleased with their healthcare services. To assess health care quality, patient satisfaction gives new insights into the various aspects of medicine, such as the effectiveness of care services [11]. Satisfaction as an important factor when delivering any kind of in-hospital care service has recently gained notoriety in the medical centers. Regarding patient-centered health care reforms, patients are demanding a claim, and expect high-level healthcare and clarified services of their providers.¹² Therefore, in order to optimize patient satisfaction assessment of health care quality is one of the imperative indicators that measured in a self-report study through a questionnaire [12]. Additionally, a fragmented and inefficient admission process may result in delays in the transition and impress patient flows of both admitted patients and other ED patients [13]. Our results supposed that ED registration procedure in each area could improve patient satisfaction rate and unmet needs in regards to health care services in comparison with central admission system. In line with our results, Soleimanpour et al. showed that the rate of general satisfaction was calculated about 34.9% in emergency medicine.¹¹ However, no statistically significant differences were shown between gender and satisfaction rate while McKinley and et al demonstrated that satisfaction rate directly correlated with gender, age and social levels [14-15]. based on our findings a rational correlation was observed between satisfaction score and residence place in model registry system. In other words, satisfaction rate in most of the urban patients was significantly higher than rural areas. In this regards, some reasons can be mentioned for rural individuals such as lack of accessibility to facilities or accommodation problems [17,18]. It is worth noting that satisfaction rate in patients from urban regions with moderate level of education was higher than patients with higher/lower education levels. This could be related to more realistic point of view and rational level of expectation of them. Finally, it would be better to organize a throughput chart that consists of triage classification rules in each level, clear illustration of the necessity of patient's companion presence in where. This leads to increased patient's orientation and satisfaction rate as well as reasonable expectations during triage and registration process in ED.

Limitation

Our study has some limitations. First, this study was conducted in two separated academic hospitals in different regions where the effects of admission policies were framed in the context of training mission and cannot be generalized to other hospitals. Therefore, the outcomes of the current study may be limited to academic health care settings. The second limitation concerns the sample size. We suggest future studies to increase the study sample size.

Conclusion

Providing high- quality care services required by patients who admitted in ED is one of the most important responsibilities. In this study, we aimed to compare two different registry procedures and evaluated satisfaction rate of admitted patients in regard to the enhancement of health care quality to reduce dissatisfaction as much as possible.

Abbreviations

ED: Emergency Department; HIS: Hospital Information System; SPSS: Statistical Package for the Social Sciences; ANOVA: Analysis of Variance; SD: Standard Deviation

Declarations

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Authors' contributions

OD and SSHV conceived the study and participated in design and coordination. SA collected the data. AR wrote the primary draft of the manuscript. AA developed the study design and contributed to manuscript preparation. HH performed the statistical analysis. All authors read and approved the final version of manuscript.

Authors' information

Not applicable

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Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Ethical considerations

The ethical approval which was attained from the local medical ethics committee of Tabriz University of Medical Sciences is IR.TBZMED.REC.1397.896. Additionally, informed consent was obtained from all individuals participated in this study.

Consent for publication

Participating in the simulation was deemed to constitute consent from the participants.

Conflicts of interest

The authors declare that they have no conflict of interest.

References

1. Asaro PV, Lewis LM, Boxerman SB. The impact of input and output factors on emergency department throughput. *Academic Emergency Medicine*. 2007; 14:235-42.
2. Bernstein SL, Aronsky D, Duseja R, Epstein S, Handel D, Hwang U, McCarthy M, John McConnell K, Pines JM, Rathlev N, Schafermeyer R, Zwemer F, Schull M, Asplin BR. The effect of emergency department crowding on clinically oriented outcomes. *Academic Emergency Medicine*. 2009; 16:1-10.
3. Gangaram P, Alinier G, Menacho AM. Crisis resource management in emergency medical settings in Qatar. *International Paramedic Practice*. 2017; 7:18-23.
4. Santos JLGd, Lima MADdS, Pestana AL, Regina E, Alacoque G, Erdmann L. Challenges for the management of emergency care from the perspective of nurses. *Acta Paulista de Enfermagem*. 2013; 26:136-43.
5. He Y, Cai B, Wang M. Research on Optimization of Registration Procedure in Emergency Department Based on System Simulation. *Procedia Computer Science*. 2016; 91:37-46.
6. Hakimzada AF, Green RA, Sayan OR, Zhang J, Patel VL. The nature and occurrence of registration errors in the emergency department. *International journal of medical informatics*. 2008; 77:169-75.
7. Tang PC, Ash JS, Bates DW, Overhage JM, Sands DZ. Personal health records: definitions, benefits, and strategies for overcoming barriers to adoption. *Journal of the American Medical Informatics Association*. 2006;13 :121-6.
8. Al-Abri R, Al-Balushi A. Patient satisfaction survey as a tool towards quality improvement. *Oman medical journal*. 2014; 29:3.
9. Binsalih SA, Waness AO, Tamim HM, Harakati MS, Al Sayyari AA. Inpatients' care experience and satisfaction study. *Journal of Family and Community Medicine*. 2011; 18:111.

10. Kang H, Nembhard HB, Rafferty C, DeFlicht CJ. Patient flow in the emergency department: a classification and analysis of admission process policies. *Annals of emergency medicine*. 2014; 64:335-42. e8.
11. Soleimanpour H, Gholipouri C, Salarilak S, Raoufi P, Vahidi RG, Rouhi AJ, Ghafouri RR, Soleimanpour M. Emergency department patient satisfaction survey in Imam Reza hospital, Tabriz, Iran. *International journal of emergency medicine*. 2011; 4:2.
12. Tsai TC, Orav EJ, Jha AK. Patient satisfaction and quality of surgical care in US hospitals. *Annals of surgery*. 2015; 261:2.
13. Chartier L, Josephson T, Bates K, Kuipers M. improving emergency department flow through Rapid Medical Evaluation unit. *BMJ Open Quality*. 2015; 4:u206156. w2663.
14. Aragon SJ, Gesell SB. A patient satisfaction theory and its robustness across gender in emergency departments: a multigroup structural equation modeling investigation. *American Journal of Medical Quality*. 2003; 18:229-41.
15. Zohrevandi B, Tajik H. A survey of patients' satisfaction in emergency department of Rasht Poursina Hospital. *Emergency*. 2014; 2:162.
16. McKinley R, Stevenson K, Adams S, Manku-Scott T. Meeting patient expectations of care: the major determinant of satisfaction with out-of-hours primary medical care? *Family practice*. 2002; 19:333-8.
17. Soufi G, Belayachi J, Himmich S, Ahid S, Soufi M, Zekraoui A, Abouqal R. Patient satisfaction in an acute medicine department in Morocco. *BMC health services research*. 2010; 10:149.
18. Reihani H, Pishbin E, Abbasi Shaye Z, Ebrahimi M, Bolvardi E, Talebi Delooi M, Momeni Moghaddam D, Vakili V. Patient satisfaction analysis in emergency department in Imam Reza hospital of Mashhad. *Journal of Patient Safety & Quality Improvement*. 2015; 3:179-83.

Tables

Table 1. Demographic characteristics of all admitted patients.

		Registration Method n (%)		p-value*
		Classic	New	
Age (Mean ± SD)		52.28 ± 22.43	38.25 ± 20.16	<0.001
Gender	Male	110 (55.28%)	121 (46.01%)	0.04
	Female	89 (44.72%)	142 (53.99%)	
First visit	Yes	96 (48.24%)	216 (87.1%)	<0.001
	No	103 (51.76%)	32 (12.9%)	
Who is completing	Patient	25 (12.56%)	146 (55.51%)	<0.001
	Patient Companion	174 (87.44%)	117 (44.49%)	
Residential place	Urban Area	89 (44.95%)	219 (83.59%)	<0.001
	Rural Area	109 (55.05%)	43 (16.41%)	
Admission shift	Morning	77 (38.69%)	45 (17.24%)	<0.001
	Evening	45 (22.61%)	67 (25.67%)	
	Night	77 (38.69%)	149 (57.09%)	
Education	Illiterate	153 (76.88%)	122 (49.39%)	<0.001
	Diploma	32 (16.08%)	88 (35.63%)	
	Academic	14 (7.04%)	37 (14.98%)	

*p-value base Pearson Chi-square test

Table 2. Results of univariate analysis for comparison of satisfaction score in levels of independent variables.

		N	Mean ± SD	p-value*
Method	Classic	197	14.66±3.9	<0.001
	New	259	16.41±3.23	
Who is completing	Patient	170	16.39±3.27	0.001
	Another one	286	15.22±3.78	
Admission shift	Morning	119	16.77±3.49	<0.001
	Evening	112	16±3.55	
	Night	223	14.90±3.61	
First visit	Yes	308	15.59±3.57	0.91
	No	134	15.54±3.81	
Gender	Male	226	15.36±3.75	0.08
	Female	230	15.95±3.51	
Location	Urban area	303	16±3.53	0.003
	Rural area	151	14.93±3.76	
Education	Illiterate	271	15.27±3.71	0.03**
	Diploma	119	16.3±3.35	
	Academic	51	15.67±3.86	

* base t-independent test **base One-way ANOVA

Table 3. Comparison of different time courses for satisfaction score of registry procedure

Method		N	Mean ± SD	p-value
Time for first visit	Classic	199	18.02±25.88	<0.001
	Model	263	7.55±8.81	
Time for any area transfer	Classic	199	7.13±8.85	<0.001
	Model	258	4.03±3.7	
Time for register	Classic	199	2.61±13.95	0.028
	Model	263	4.9±5.14	
Time for final decision	Classic	199	31.82±51.31	<0.001
	Model	245	80.83±116.08	

Table 4. Predictors of patient's satisfaction

		β (SE)	t-value	P-value
Registration Method	Classic	Ref		
	Model	1.8(0.43)	4.210	0.000
Who Is Completing	Patient			
	Patient Companion	0.16(0.39)	0.418	0.676
First visit	Yes	Ref		
	No	-0.85(0.2)	-4.234	0.000
Gender	Male	Ref		
	Female	0.07(0.31)	0.237	0.813
Residential place	Urban Area	Ref		
	Rural area	0.05(0.37)	0.128	0.898
Education	Illiterate	Ref		
	Diploma	0.26(0.41)	0.638	0.524
	Academic	0.09(0.52)	0.173	0.863
Age		-0.01(0.01)	-0.825	0.410
Time For First Visit		-0.05(0.01)	-5.632	0.000
Time For Any Area Transfer		-0.05(0.02)	-1.882	0.061
Time For Register		-0.06(0.02)	-3.889	0.000
Time For Decision		-0.01(0.002)	-3.591	0.000

Table 5. Comparison of Satisfaction Score regarding to independent variables in two registration systems

		Classic Registration			New Registration		
		N	Mean ± SD	P-value	N	Mean ± SD	p-value
Who is completing	Patient	25	14.00 ± 3.57	0.36	145	16.8 ± 3.04	0.03
	Another one	172	14.76 ± 3.95		114	15.92 ± 3.41	
Admission shift	Morning	75	16.05 ± 3.90	<0.001	44	18.00 ± 2.20	<0.001
	Evening	45	13.38 ± 3.44		67	17.76 ± 2.33	
	Night	77	14.06 ± 3.79		146	15.34 ± 3.44	
First visit	Yes	95	14.07 ± 3.86	0.04	213	16.26 ± 3.23	0.59
	No	102	15.22 ± 3.88		32	16.59 ± 3.43	
Gender	Male	108	14.33 ± 3.99	0.19	118	16.31 ± 3.26	0.62
	Female	89	15.07 ± 3.78		141	16.5 ± 3.22	
Location	Urban area	88	14.98 ± 4.14	0.3	215	16.42 ± 3.17	0.79
	Rural area	108	14.40 ± 3.72		43	16.28 ± 3.58	
Education	Illiterate	151	14.6 ± 3.83	0.51	120	16.12 ± 3.40	0.47
	Diploma	32	15.28 ± 3.79		87	16.68 ± 3.12	
	Academic	14	13.93 ± 4.98		37	16.32 ± 3.18	

Figures

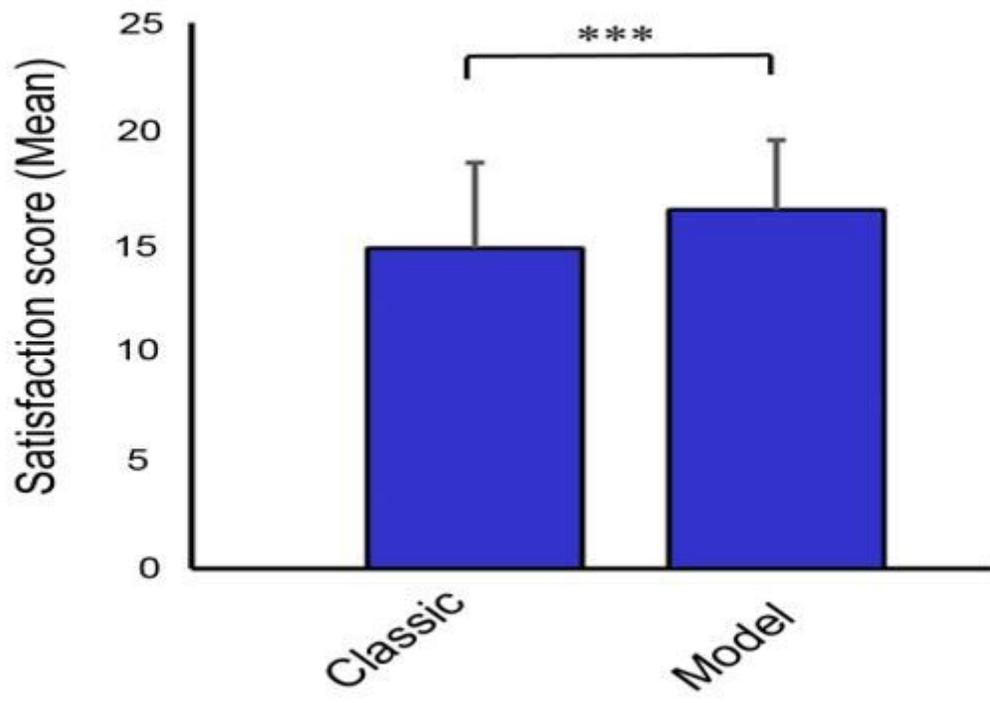
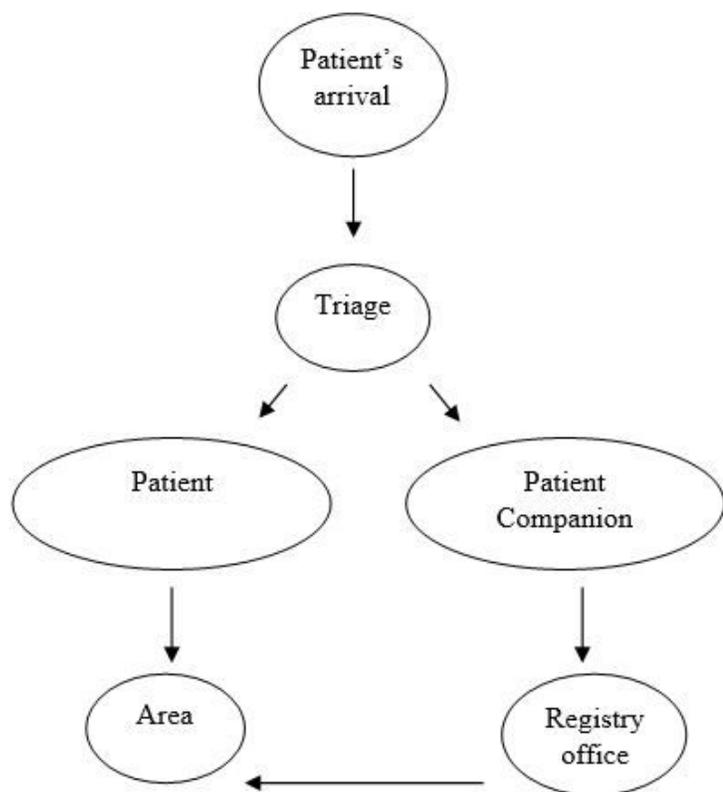


Figure 1

[No legend available.]

Classic registry procedure



New registry procedure

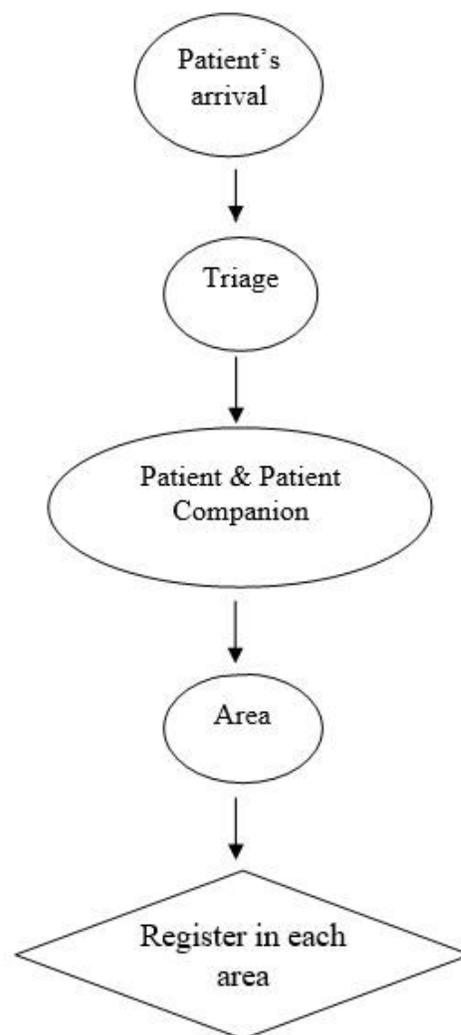


Figure 2

[No legend available.]