Patient satisfaction in a tertiary care center (Tunisia, 2015-2016)

La satisfaction des patients dans un centre de soins tertiaires (Tunisie, 2015-2016)

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RÉSUMÉ

Introduction: La satisfaction des patients est l'un des indicateurs les plus couramment utilisés pour l'évaluation de la qualité des services de santé. L'objectif de cette étude était de mesurer les taux de satisfaction globaux et spécifiques des patients et d'identifier les déterminants de la satisfaction à l'hôpital universitaire de Sahloul en 2015 et 2016.

Méthodes: Il s'agit d'une étude transversale comprenant un échantillon aléatoire de patients hospitalisés à l'hôpital universitaire de Sahloul entre 2015 et 2016. L'enquête a été menée à l'aide d'un questionnaire original auto-administré. Quatre dimensions spécifiques de satisfaction ont été explorées: administrative, technique, logistique et relationnelle. Les taux de satisfaction globaux et spécifiques ont été calculés, puis les facteurs associés à la satisfaction des patients ont été identifiés grâce à une analyse multivariée utilisant un modèle de régression logistique.

Résultats: Un total de 1897 patients ont été inclus dans l'étude avec un âge moyen de 42,4 ans (ET = 20,5 ans) et un sex-ratio de 0,94. Le taux de satisfaction des patients était d'environ 67%. Les éléments de satisfaction étaient principalement en rapport avec la dimension relationnelle: le respect de l'intimité du patient et la qualité de l'information donnée. Ceux d'insatisfaction étaient d'ordre logistique: L'environnement physique dans la chambre, la propreté des toilettes et les délais d'attente. Les déterminants de la satisfaction des patients étaient principalement liés à la qualité de l'accès et de la réception, aux conditions d'hébergement, aux soins techniques, à la qualité de l'information et au respect de l'intimité du patient.

Conclusion: Cette étude constitue une action pionnière de mesure de la qualité des soins en Tunisie. Elle a permis de documenter les sources d'insatisfaction des patients hospitalisés à l'hôpital universitaire de Sahloul. Des mesures d'intervention en fonction de ces insuffisances devraient être entreprises.

Mots-clés

Satisfaction du patient; Qualité des soins de santé; Centres de soins tertiaires; Questionnaire; Tunisie.

SUMMARY

Introduction: Patient satisfaction is one of the most commonly used indicators in healthcare service quality evaluation. The aim of the study was to measure overall and specific patient satisfaction rates and to identify determinants of satisfaction in Sahloul University hospital during 2015 and 2016.

Methods: This is a cross-sectional study which included a random sample of patients hospitalized in Sahloul University Hospital between 2015 and 2016. The survey was conducted through an original self-administered questionnaire. Four specific dimensions of satisfaction were explored: administrative, technical, logistic and relational. Overall and specific satisfaction rates were calculated and then patient satisfaction associated factors were identified through a multivariate analysis using a logistic regression model.

Results: A total of 1897 patients were included in the study with a mean age of 42.4 years (SD =20.5 years) and a sex ratio of 0.94. Overall patient satisfaction rate was about 67%. Items of satisfaction concerned mainly the relational dimension: the respect of the patient intimacy and the quality of information given. Those of dissatisfaction were mainly logistic: The physical environment in the hospital room, the cleanliness of toilets and waiting times. Determinants of patient satisfaction were mainly related to the quality of access and reception, the accommodation conditions, the technical care, the quality of information and the respect of patient intimacy.

Conclusion: This study is a pioneering action to measure the quality of care in Tunisia. It highlighted the causes of patient dissatisfaction at Sahloul University Hospital. Appropriate measures to correct these deficiencies should be undertaken.

Key-words

Patient Satisfaction; Quality of health care; Tertiary Care Centers; Questionnaire; Tunisia.

رضاء المرضى في مركز رعاية صحي من الدرجة الثالثة (تونس ، 2015-2016)

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مقدمة: يُعد رضاء المرضى أحد المؤشرات الأكثر استخدامًا لتقييم جودة الخدمات الصحية في المؤسسات الاستشفائية. كان الهدف من هذه الدراسة قياس معدلات رضاء المرضى العامة والخصوصية وكشف محددات الرضاء العام في المستشفى الجامعي بسهلول خلال عامي 2015 و 2016

الطريقة: هذه دراسة مقطعية شملت عينة عشوائية من المرضى بالمستشفى الجامعي سهلول بسوسة بين عامي 2015 و 2016. أجريت هذه الدراسة بواسطة استبيان أصلي ذاتي الإجابة. تم عن طريقه استكشاف أربعة أبعاد لرضاء المرضى: إدارية، تقنية، لوجستية وعلائقية. تم احتساب معدلات الرضا العامة والخصوصية ومن ثم البحث عن العوامل المحددة للرضاء العام للمريض.

النتائج: شارك في هذه الدراسة 1897 مريضا حيث قدر متوسط العمر لديهم ب42.4 ± 20.5 سنة و نسبة الجنس ب 0.94. وبلغ معدل رضاء المرضى الإجمالي حوالي 67 ٪. وكانت أعلى معدلات الرضاء متعلقة أساسا بالبعد العلائقي: احترام خصوصيات المريض وطريقة تقديم المعلومة من طرف الإطار الطبي و الشبه الطبي. بينما كانت أدناها لوجستية بالأساس: حالة غرف الإقامة ، نظافة المراحيض ومدة الانتظار. كما كشفت هذه الدراسة عن محددات الرضاء العام لدى المرضى حيث تبين أن هذا الرضاء مرتبط بمدى الرضاء عن طريقة الاستقبال، سهولة النفاذ ووضوح الارشادات، الإقامة، الرعاية المسداة ،الإجابة عن الاستفسارات و احترام خصوصيات المريض.

الاستنتاج: تعتبر هذه الدراسة عملا رائدا لقياس جودة الخدمات الصحية في تونس، مكن من تسليط الضوء على أسباب عدم رضاء المرضى في المستشفى الجامعي سهلول مما سيساعد على اتخاذ التدابير اللازمة لتحسين جودة الاداء الاستشفائي بهذه المؤسسة.

الكلمات المفاتيح: رضاء المرضى؛ جودة الرعاية الصحية؛ مراكز الصحة من الدرجة الثالثة؛ استبيان؛ تونس.

Conflict of interest:

Authors declare no conflict of interest.

Ethical considerations: The study was conducted under good clinical practice conditions and according to the ethical standards collections. During the study, verbal informed consent was sought from all the respondents before answering the questionnaire.

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INTRODUCTION

Patient satisfaction is a way to evaluate the "perceived quality" of care, and is currently considered in all certification and accreditation manuals as a preliminary indicator used in health care service quality evaluation (1,2). It is a composite indicator and integrator of a multitude of variables exploring multiple dimensions, mainly administrative, logistic, technical and relational aspects (3-5). Measuring this indicator has become a common practice for decades in developed countries (6).

However, in Tunisia, the quality of care paradigm has only recently been introduced in our health facilities. In fact, the Tunisian health system, after a phase of health coverage, has started to support the quality of care in its hospitals in order to implement certification procedures and accreditation of its institutions (7). Unfortunately, these efforts have not yet led to a significant improvement in hospital performance because of a lack of ways to evaluate the quality of care delivery. Thus, implementing continuous surveys measuring quality indicators like patient satisfaction becomes crucial in all our health structures nowadays.

In Tunisia, as well as in many other Maghreb countries, studies focusing on patient satisfaction were rare and limited to few short-term ones (8-10). That is why we have launched an annual survey in Sahloul University Hospital since 2015 in order to continuously monitor patient satisfaction as is done in developed countries (11).

Such an annual monitoring will certainly help managers to identify the gaps between what a patient expects and what he receives (2). This will help policy makers to take decisions and implement appropriate interventions in order to improve hospital performance and patient satisfaction.

In this manuscript, we reported the findings of this survey during 2015 and 2016 which aims were: To measure overall and specific patient satisfaction rates and to identify the patient satisfaction associated factors in Sahloul University hospital during 2015 and 2016.

METHODS

Study setting: Sahloul University Hospital is a tertiary-level health care institution located in Sousse governorate in Tunisia. It is considered among the best known healthcare institutions in the coastal region of the country and it admits patients from several Tunisian governorates. It includes an emergency ward, eight surgical and eight medical departments. Its Information Systems Direction (ISD) is a medico-administrative interface structure responsible for the management of hospital data and the evaluation of the level of hospital performance.

Study design: It turns about a cross sectional study conducted during two years from 1 January 2015 to 31 December 2016. It had included a random sample of 1897 patients hospitalized in the different departments of Sahloul University Hospital. The number of patients recruited in each department represented at least 10% of the number of hospitalizations per year in that department.

Data collection: The survey was conducted through an original anonymous self-administered questionnaire developed in Arabic language after a review of the literature and validated by a focus group representing the different actors of care.

It recorded socio demographic characteristics especially: age, sex, governorate, health insurance and was composed of 12 questions and 33 items with four propositions according to the Likert scale. It explored satisfaction about four dimensions of health services: logistic, technic, administrative and relational dimensions. Overall patient satisfaction was retained if we had three positive responses to the following questions: "Are you generally satisfied with your hospitalization?", "Do you recommend this hospital to other people?" and "If you have a choice, will you return to this hospital if necessary?" The question about overall patient satisfaction was asked in these three different ways in order to judge the perception of patients more objectively.

Statistical analysis: Data were entered and analyzed using IBM SPSS Statistics version 20.0 software. Overall and specific satisfaction rates were calculated and then patient satisfaction associated factors were identified through a multivariate analysis using a logistic regression model. Significance was accepted at the two-sided level of 0.05. All the variables that came out to be significant in the univariate analysis with a level of significance (p) ≤ 0.2 were introduced in the model of logistic regression.

RESULTS

A total of 1897 patients were included in the study with a sample size of 1269 in surgical departments and 628 in medical departments. The mean age was 42.4 years (SD = 20.5 years) with a sex ratio of 0.94. Half of them were from Sousse Governorate and 60% of them had health insurance. The general population characteristics were described in table I.

Table 1: Distribution, by general characteristics, of 1897 patients hospitalized in Sahloul University Hospital between 2015 and 2016.

		2015 (N=893)		2016 (N=1004)		Total (N=1897)	
		n	%	n	%	n	%
Sex	Male	460	**51.5**	455	**45.3**	915	**48.2**
	Female	428	**47.9**	544	**54.2**	972	**51.2**
	MD	5	**0.6**	5	**0.5**	10	**0.5**
Age class	0-39 years	357	**40.0**	401	**39.9**	758	**40.0**
	40-59 years	256	**28.7**	281	**28.0**	537	**28.3**
	≥60 years	181	**20.3**	220	**21.9**	401	**21.1**
	Missing data	99	**11.1**	102	**10.2**	201	**10.6**
Admission type	Emergency	327	**36.6**	376	**37.5**	703	**37.1**
	After medical check-up	235	**26.3**	245	**24.4**	480	**25.3**
	Appointment	314	**35.2**	351	**35.0**	665	**35.1**
	Others	1	**0.1**	0	**0.0**	1	**0.1**
	MD	16	**1.8**	32	**3.2**	48	**2.5**
Governorate	Sousse	456	**51.1**	499	**49.7**	955	**50.3**
	Kairouan	127	**14.2**	126	**12.5**	253	**13.3**
	Monastir	49	**5.5**	46	**4.6**	95	**5.0**
	Mahdia	47	**5.3**	54	**5.4**	101	**5.3**
	Others	204	**22.8**	263	**26.2**	467	**24.6**
	MD	10	**1.1**	16	**1.6**	26	**1.4**
Health insurance	CNAM[a]	553	**61.9**	584	**58.2**	1137	**59.9**
	Full price	54	**6.0**	47	**4.7**	101	**5.3**
	Reduced price	136	**15.2**	167	**16.6**	303	**16.0**
	Needy	97	**10.9**	98	**9.8**	195	**10.3**
	Others	2	**0.2**	1	**0.1**	3	**0.2**
	MD	51	**5.7**	107	**10.7**	158	**8.3**
Department	Surgical	636	**71.2**	633	**63.0**	1269	**66.9**
	Medical	257	**28.8**	371	**37.0**	628	**33.1**
Response	Patient	653	**73.1**	720	**71.7**	1373	**72.4**
	Parent	240	**26.9**	278	**27.7**	518	**27.3**
	MD	0	**0.0**	6	**0.6**	6	**0.3**

a: Caisse Nationale d'Assurance Maladie (National Health Insurance Fund) MD: Missing Data

Overall satisfaction rates: During the study period, more than 67% of the included patients hospitalized in Sahloul University hospital expressed a good impression on the quality of care provided (figure 1).

Specific satisfaction rates: The main items of satisfaction concerned mainly the relational dimension: the respect of the patient intimacy (77.9%, 95%CI [77.1%-78.6%]), and the quality of information given (65.5%, 95%CI [64.8%-66.1%]). Those of dissatisfaction were mainly logistic: The physical environment in the hospital room (22%, 95%CI [21.8%-22.2%]), the cleanliness of toilets (23.3%, 95%CI [23.0%-23.5%]), waiting times (37.4%, 95%CI [36.9%-37.8%]) and food service (39%, 95%CI [38.5%-39.4%]). Technical and administrative dimension were moderately appreciated (table II).

Table 2: Specific satisfaction rates in Sahloul University Hospital between 2015 and 2016.

	2015 (N=893)		2016 (N=1004)		Total (N=1897)	
	n	%	n	%	n	%
Technical dimension						
Health care	488	**54.6**	544	**54.2**	1032	**54.4**
Medical discharge	448	**50.2**	436	**43.4**	884	**46.6**
Administrative dimension						
Administrative discharge	479	**53.6**	478	**47.6**	957	**50.4**
Logistic dimension						
Access	578	**64.7**	634	**63.1**	1212	**63.8**
Waiting time	333	**37.3**	377	**37.5**	710	**37.4**
Physical environment in the room	205	**23.0**	213	**21.2**	418	**22.0**
Toilets	200	**22.4**	242	**24.1**	442	**23.3**
Food service	338	**37.8**	402	**40.0**	740	**39.0**
Relational dimension						
Reception	460	**51.5**	531	**52.9**	991	**52.2**
Respect for privacy	697	**78.1**	781	**77.8**	1478	**77.9**
Information	599	**67.1**	643	**64.0**	1242	**65.4**
Staff behavior	470	**52.6**	498	**49.6**	968	**51.0**

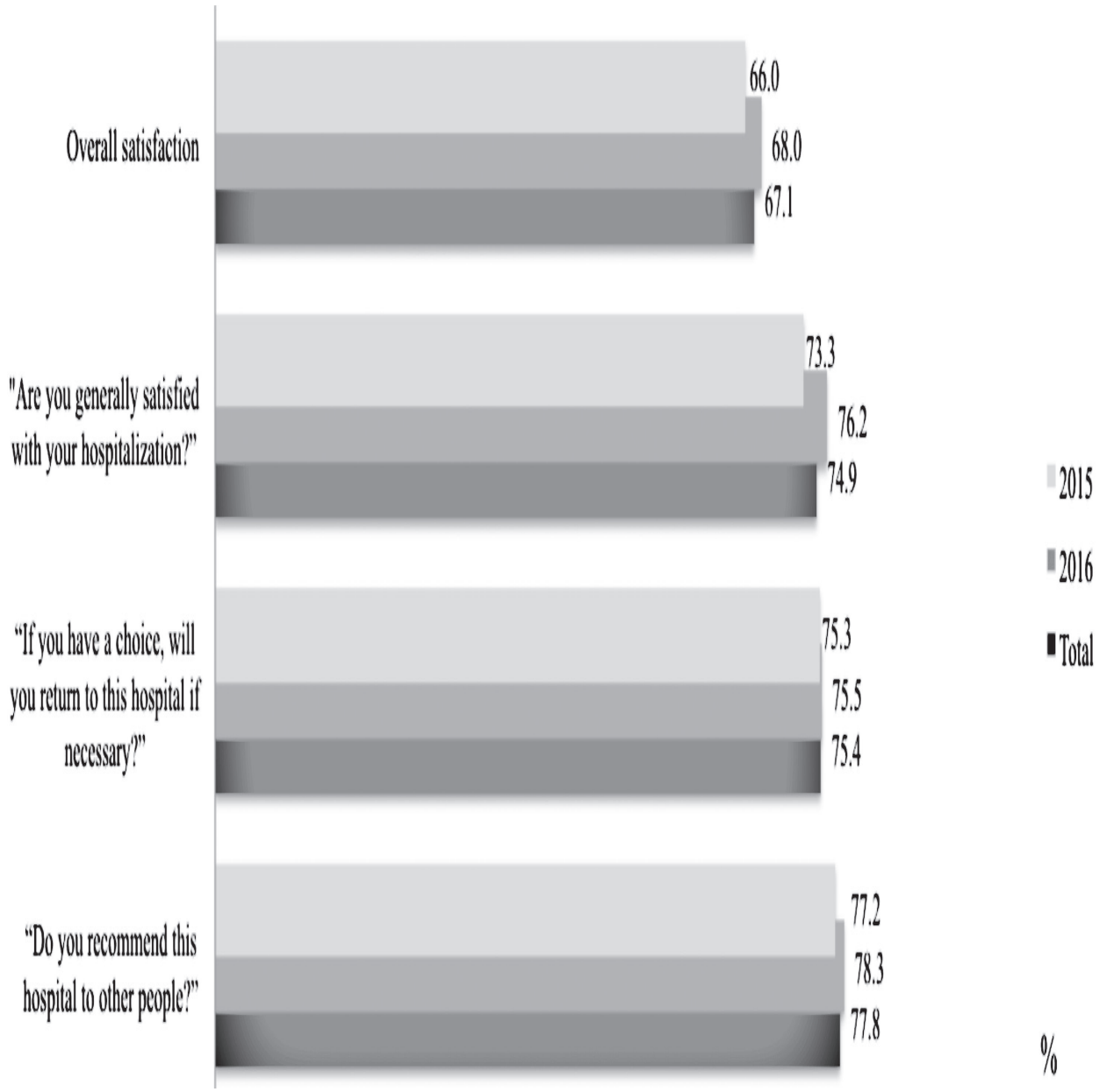

Figure 1: Overall patient satisfaction rates in Sahloul University Hospital between 2015 and 2016.

Patient satisfaction associated factors: The multivariate logistic regression analysis (table III) identified seven independent associated factors with overall patient satisfaction which were: Age over 40 years, satisfaction with quality of health care, satisfaction with the access to the hospital and its departments, satisfaction with physical environment in the hospital room, satisfaction with reception, satisfaction with the respect of the patient intimacy and satisfaction with the quality of information given.

Table 3: Associated factors with patient satisfaction in Sahloul University hospital between 2015 and 2016 (Univariate analysis)

	N	Overall satisfaction		Univariate analysis		
		n	%	P	cOR	95%IC
General characteristics :						
SexMale	903	610	67.6		1	
Female	962	654	68.0	0.84	1.02	[0.84 – 1.23]
Age<40 years	752	483	64.2		**1**	
≥40 years	928	667	71.9	**<10^{-3}**	**1.42**	**[1.15 – 1.75]**
Admission typeUrgent	696	453	65.1		1	
Planned	1136	790	69.5	0.04	1.23	[1.00 – 1.49]
GovernorateSousse	945	624	66.0		1	
Others	908	633	69.7	0.09	1.18	[0.97 – 1.44]
DepartmentSurgical	1254	833	66.4		1	
Medical	621	439	70.7	0.06	1.21	[0.98 – 1.50]
ResponseParent	511	345	67.5		1	
Patient	1360	926	68.1	0.81	0.97	[0.78 – 1.21]
Perception on :						
Technical dimension						
Health careBad	700	313	44.7		**1**	
Good	1024	863	84.3	**<10^{-3}**	**6.62**	**[5.29 – 8.29]**
Medical dischargeBad	581	273	47.0		**1**	
Good	873	716	82.0	**<10^{-3}**	**5.14**	**[4.06 – 6.52]**
Administrative dimension						
AdministrativeBad discharge	512	227	44.3		**1**	
Good	947	760	80.3	**<10^{-3}**	**5.10**	**[4.02 – 6.46]**
Logistic dimension						
AccessBad	641	259	40.4		**1**	
Good	1201	989	82.3	**<10^{-3}**	**6.88**	**[5.54 – 8.54]**
Waiting timeBad	1097	604	55.1		**1**	
Good	704	622	88.4	**<10^{-3}**	**6.19**	**[4.77 – 8.02]**
Physical environment inBad the room	1339	811	60.6		**1**	
Good	411	378	92.0	**<10^{-3}**	**7.45**	**[5.13 –10.82]**
ToiletsBad	1403	872	62.2		**1**	
Good	444	383	86.3	**<10^{-3}**	**3.80**	**[2.85 – 5.11]**
Food serviceBad	910	502	55.2		**1**	
Good	732	617	84.3	**<10^{-3}**	**4.36**	**[3.43 – 5.53]**
Relational dimension						
ReceptionBad	692	312	45.1		**1**	
Good	984	829	84.2	**<10^{-3}**	**6.51**	**[5.18 – 8.18]**
Respect for privacyBad	367	115	31.3		**1**	
Good	1466	1133	77.3	**<10^{-3}**	**7.45**	**[5.79 – 9.59]**
InformationBad	484	184	38.0		**1**	
Good	1232	995	80.8	**<10^{-3}**	**6.84**	**[5.42 – 8.63]**
Staff behaviorBad	843	395	46.9		**1**	
Good	960	826	86.0	**<10^{-3}**	**6.99**	**[5.57 – 8.77]**

95% CI: 95 % Confidence Interval cOR: Crude Odds Ratio

a:Admission after a check-up or after an appointment

DISCUSSION

Patient centered care has been considered since decades as a major component in the healthcare mission. This approach helps to understand patient' problems and consequently to satisfy their needs (12). That is why, patient satisfaction evaluation becomes a necessity in all healthcare organizations in order to identify service factors that need improvement and guide policy makers to make appropriate decisions (13,14). On the other hand, the measurement of patient satisfaction is considered today as a tool towards healthcare quality improvement (15) and it becomes a systematically assessed indicator in many developed countries (16-18). In this context, Sahloul university Hospital has launched since 2015 a survey on patient satisfaction which aims to monitor through an annual report the perceived quality of care in this hospital.

This study had some limitations that should be mentioned: A selection bias is very probable due to the fact that less satisfied patients are more likely to respond to the questionnaire in order to express their dissatisfaction. This may underestimate satisfaction levels. The questionnaire was self-administered in order to minimize information bias. However this bias could be encountered when the responder was the parent and not the patient himself. That could distort the actual perception of the patient. Information bias could be also due to the misinterpretation of some questions. To overcome this problem, a pre-test was carried out on a reduced number of patients. On the other hand, many related patient characteristics that could affect patient satisfaction levels as a potential determinants or confounders like health status, level of education and socio-economic status were not collected in the questionnaire and then their relation with overall satisfaction was not studied. Length of hospital stay which was reported to be a determinant of patient satisfaction in several studies (19), was also not studied because of a lot of missing data about the date of discharge: In fact the majority of patients responded to the questionnaire during their hospitalization before discharge.

Our study showed that overall patient satisfaction was around 67% between 2015 and 2016. In France, the overall score of satisfaction for all health care institutions was 72.7 out of 100 in 2016 which was judged as passable but not extraordinary for a satisfaction score (20). Higher scores (98.7%) were recorded in a study conducted in Swiss land according Heidegger T et al (21). In Tunisia, given the available resources of the public sector health care system, we can say that the overall satisfaction rate found in this study is acceptable. It could considerably increase if a benchmarking evaluation system would

Table 4: Determinants of patient satisfaction in Sahloul University Hospital between 2015 and 2016

(Multivariate analysis)

	Associated factor	Reference	Univariate analysis			Multivariate analysis		
			p	cOR	95%IC	p	cOR	95%IC
General characteristics :								
Age	>40 years	≤40 years	**<10^{-3}**	**1.42**	**[1.15 – 1.75]**	**<10^{-3}**	**1.68**	**[1.32 –2.14]**
Admission type	Planned[a]	Urgent	0.04	1.23	[1.00 – 1.49]	0.24	0.79	[0.54 –1.16]
Governorate	Others	Sousse	0.09	1.18	[0.97 – 1.44]	0.51	1.13	[0.78 –1.64]
Department	Medical	Surgical	0.06	1.21	[0.98 – 1.50]	0.74	0.93	[0.63 –1.37]
Perception on :								
Technical dimension								
Health care	Good	Bad	**<10^{-3}**	**6.62**	**[5.29 – 8.29]**	**0.01**	**1.69**	**[1.10 – 2.60]**
Medical discharge	Good	Bad	**<10^{-3}**	**5.14**	**[4.06 – 6.52]**	0.16	1.35	[0.88 –2.09]
Administrative dimension								
Administrative discharge	Good	Bad	**<10^{-3}**	**5.10**	**[4.02 – 6.46]**	0.60	1.12	[0.73 –1.71]
Logistic dimension								
Access	Good	Bad	**<10^{-3}**	**6.88**	**[5.54 – 8.54]**	**<10^{-3}**	**2.21**	**[1.46 – 3.34]**
Waiting time	Good	Bad	**<10^{-3}**	**6.19**	**[4.77 – 8.02]**	0.20	1.36	[0.84 –2.21]
Physical environment in the room	Good	Bad	**<10^{-3}**	**7.45**	**[5.13 –10.82]**	**0.04**	**1.87**	**[1.02 – 3.44]**
Toilets	Good	Bad	**<10^{-3}**	**3.80**	**[2.85 – 5.11]**	0.43	1.23	[0.72 – 2.10]
Food service	Good	Bad	**<10^{-3}**	**4.36**	**[3.43 – 5.53]**	0.17	1.33	[0.88 –2.03]
Relational dimension								
Reception	Good	Bad	**<10^{-3}**	**6.51**	**[5.18 – 8.18]**	**0.03**	**1.59**	**[1.02 –2.47]**
Respect for privacy	Good	Bad	**<10^{-3}**	**7.45**	**[5.79 – 9.59]**	**<10^{-3}**	**2.46**	**[1.56 –3.87]**
Information	Good	Bad	**<10^{-3}**	**6.84**	**[5.42 – 8.63]**	**0.03**	**1.62**	**[1.04 –2.50]**
Staff behavior	Good	Bad	**<10^{-3}**	**6.99**	**[5.57 – 8.77]**	0.07	1.52	[0.96 –2.40]

aOR: adjusted Odds Ratio 95%IC : 95 % Confidence Interval a: Admission after a check-up or after an appointment

be established between our hospitals and between the departments within the same hospital.

When examining the results by items of satisfaction, we find that the respect of patient intimacy, the quality of information and the access were the most appreciated items with scores higher than 60%. Technical care, discharge organization, reception and staff behavior had passable rates of satisfaction (around 50%). Those concerning waiting times and food service had scores under 40%. Scores were about 20 % for physical environment and cleanliness of toilets. According a study conducted in Demerdash University Hospital in Egypt, it was found that inpatients' satisfaction for physicians' care of patients, nursing care, administrative facilities and physical environment was 61, 42, 52 and 46%, respectively (22). Soufi G et al, in a study performed in Morocco, reported average satisfaction rates on the medical information dimension (23). Whereas ,the findings of the national survey conducted in France during 2016 showed significantly higher scores :(80% for technical health care, 72% for reception, 66% for food service and 62 % for discharge organization) (20). According a survey conducted in Spain, levels of satisfaction were also higher especially for: information, human care, comfort and intimacy (24).

It could be understood that patient satisfaction in developed countries especially for logistic dimension is significantly higher than less developed ones due to the

low available resources of our health care system: The physical environment in the room, the cleanliness of toilets, waiting times and food service were not enough appreciated because of an enormous hospitalization rate in Sahloul University hospital: In fact the bed occupancy rate exceeds 90% in most tertiary level public hospital facilities in Tunisia (25).

Our study identified seven predictors of patient satisfaction:

Age over 40 years: That would be explained by higher tolerance rates among aged people; in fact many studies showed that older patients were more satisfied with health services than younger ones (1,17).

Technical care: Several studies (26) identified that perceived competency of health professionals had one of the most significant impact on the variations in patient satisfaction.

Access*:* Patients with good perception of accessibility to the hospital and its departments had significantly higher overall satisfaction levels. When reviewing the literature, we find that many studies stated that patient satisfaction was positively associated with this factor (17).

Physical environment in the hospital room*:* Many environmental factors were shown to be predictors of patient satisfaction especially: Cleanliness (27), pleasantness of the atmosphere, room comfort, bedding, temperature convenience and lighting convenience (17).

Reception quality*:* The courtesy of the receptionist was also considered as a predictive factor of patient satisfaction according to Bouaiti E et al (28).

Intimacy and privacy: Aldana JM et al (29) highlighted that privacy respect by health professionals was significantly associated with patient satisfaction in two studies conducted respectively in Turkey and Bangladesh.

Quality of information*:* The quality of information on illnesses, treatments, tests, and medicines by nurses and physicians (30) were strongly associated with overall patient satisfaction.

In conclusion, we can say that the levels of patient satisfaction in Sahloul University Hospital are average compared to those found in the developed countries. The lowest satisfaction rates were mainly related to accommodation conditions and waiting times. Determinants of patient satisfaction were mainly related to the quality of access and reception, the accommodation conditions, the technical care, the quality of information and the respect of patient intimacy. Taking these results into account, certain measures should be undertaken: First, to continuously monitor the levels of patient satisfaction in our health institutions in Tunisia. Second, to set up a benchmarking evaluation system between our hospitals and between the departments within the same hospital. Third, to target the least satisfactory dimensions of care and to focus on determinants of satisfaction through appropriate interventions.

REFERENCES

1. Allegranzi B, Bagheri Nejad S, Combescure C et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. Lancet (London, England). 2011;377(9761):228-41.
2. Organization WH. Report on the burden of endemic health care-associated infection worldwide. 2011.
3. Vincent JL, Bihari DJ, Suter PM et al. The prevalence of nosocomial infection in intensive care units in Europe. Results of the European Prevalence of Infection in Intensive Care (EPIC) Study. EPIC International Advisory Committee. Jama. 1995;274(8):639-44.
4. Ministère de la santé dljedsDD, CTINILS Actualisation de la définition des Infections Nosocomiales. . 2007.
5. Kallel H, Dammak H, Bahloul M et al. Risk factors and outcomes of intensive care unit-acquired infections in a Tunisian ICU. Medical science monitor : international medical journal of experimental and clinical research. 2010;16(8):Ph69-75.
6. Trifi A, Abdellatif S, Oueslati M et al. Nosocomial infections: current situation in a resuscitation-unit. La Tunisie medicale. 2017;95(3):179-84.
7. El Rhazi K, Elfakir S, Berraho M et al. [Prevalence and risk factors for nosocomial infections in Hassan II University Hospital, Fes, Morocco]. Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit. 2007;13(1):56-63.
8. Bezzaoucha A, Makhlouf F, Dekkar N, Lamdjadani N. Prévalence des infections nosocomiales au centre hospitalo-universitaire de Bab El Oued-Alger. Medecine et maladies infectieuses. 1994;24(2):96-101.
9. Atif ML, Bezzaoucha A, Mesbah S, Djellato S, Boubechou N, Bellouni R. Évolution de la prévalence des infections nosocomiales dans un centre hospitalier universitaire en Algérie (2001 à 2005). Medecine et maladies infectieuses. 2006;36(8):423-8.
10. Suetens C, Hopkins S, Kolman J, Diaz Högberg L. European Centre for Disease Prevention and Control. Point prevalence survey of healthcare associated infections and antimicrobial use in European acute care hospitals. 2013; Sweden: ECDC. ECDC Stockholm, Sweden; 2013.
11. Saidani M, Hammami S, Kammoun A, Slim A, Boutiba-Ben Boubaker I. Emergence of carbapenem-resistant OXA-48 carbapenemase-producing Enterobacteriaceae in Tunisia. Journal of medical microbiology. 2012;61(Pt 12):1746-9.
12. Rejeb MB, Sahli J, Chebil D et al. Mortality among Patients with

Nosocomial Infections in Tertiary Intensive Care Units of Sahloul Hospital, Sousse, Tunisia. Archives of Iranian medicine. 2016;19(3):179-85.
13. El Kettani A, Zerouali K, Diawara I et al. [Healthcare-associated bacteraemia in intensive care units of Ibn Rochd University Hospital, Casablanca]. Sante publique (Vandoeuvre-les-Nancy, France). 2017;29(2):209-13.
14. Hammami S, Ghozzi R, Saidani M, Ben Redjeb S. Carbapenem-resistant Acinetobacter baumannii producing the carbapenemase OXA-23 in Tunisia. La Tunisie medicale. 2011;89(7):638-43.
15. Jaidane N, Naas T, Oueslati S et al. Whole genome sequencing of NDM-1-producing ST85 Acinetobacter baumannii isolates from Tunisia. International journal of antimicrobial agents. 2018.
16. Chaari A, Mnif B, Bahloul M et al. Acinetobacter baumannii ventilator-associated pneumonia: epidemiology, clinical characteristics, and prognosis factors. International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases. 2013;17(12):e1225-8.
17. Mathlouthi N, Al-Bayssari C, El Salabi A et al. Carbapenemases and extended-spectrum beta-lactamases producing Enterobacteriaceae isolated from Tunisian and Libyan hospitals. Journal of infection in developing countries. 2016;10(7):718-27.
18. Chabah M, Chemsi M, Zerouali K et al. Healthcare-associated infections due to carbapenemase-producing Enterobacteriaceae: Bacteriological profile and risk factors. Medecine et maladies infectieuses. 2016;46(3):157-62.