ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4

Journal of Coastal Life Medicine

The Impact of Communication Skills on Lab Test Results: The Moderating Effect of the Perceived Risk of Patients in Healthcare Organizations

Received: 15 February 2023, **Revised:** 22 March 2023, **Accepted:** 20 April 2023

Salwa Almarwani[1], Nizar Alsubahi[23*], Ahmed Alzahrani[2,3], Fahad Nasser Alhazmi[2], Ala'eddin Ahmad[4]

1Department of Pathology and Laboratory Medicine, King Abdulaziz Medical City- Western Region KAMC-WR), Jeddah, Saudi Arabia,
Email: Almrwanisa@yahoo.com
2Department of Health Service and Hospital Administration, Faculty of Economics and Administration, King Abdul University, Jeddah, Saudi Arabia.
Email: nalsubahi@kau.edu.sa, aaaalzahranil8@kau.edu.sa, fnalhazmi@kau.edu.sa
3*Department of Health Services Research, CAPHRI, Maastricht University Medical Center, Faculty of Health, Medicine and Life Sciences, Maastricht, The Netherlands,
Email: nizar.alsubahi@maastrichtuniversity.nl, ahmed.alzahrani@maastrichtuniversity.nl
4Digital Marketing Department, Al-Zaytoonah University of Jordan, Amman 1733, Jordan,
Email: aladdin7385@gmail.com
Corresponding author: nalsubahi @kau.cdu.sa., nizar.alsubahi@maastrichtuniversity.nl

Keywords:
Communication Skills, Rapport, Empathy, Support, Partnership, Explanation, Cultural competence, Trust, Laboratory test, Hospitals, Saudi Arabia.

Abstract
The study focuses on underscoring the impacts of communication skills on the outcomes of lab tests carried out at King Abdul-Aziz Medical City (National Guard) in Jeddah (KAMC). The researchers aimed to assess the factors affecting communication skills adopted by health services providers at KAMC. A descriptive analytical method was used to attain the study objectives of understanding the impacts of communication skills on lab test results. The researchers used questionnaires consisting of two sections; personal data of the study sample and the seven-pronged list of factors associated to communication skills among healthcare providers at KAMC. The factors that influenced communication skills among healthcare providers included rapport, support, explanation, trust, empathy, partnership, and cultural competence. A total of 299 study subjects including nurses, laboratory technician and physicians were involved in answering the questionnaire. However, only 245 (85%) of the study population completed questionnaires. The study found there is a significant correlation between four factors including rapport, partnership, empathy, and cultural competence to communication skills in healthcare providers. However, there was correlation between factors such as support, trust, and explanation and the communication skills among healthcare providers. The research recommends the hospital to motivate healthcare providers to improve their communication skills by encouraging them to provide quality healthcare services. The hospital is advised to promote education in communication skills, and adopt it as an organizational culture.

1. Introduction

Clinical laboratories serve significant role in performing medical tests that are sent to physicians to help them with decision-making about the patients' conditions. The medical tests diagnose and facilitate the monitoring of patient's conditions, thus ensuring appropriate treatment is given. It is crucial to have medical tests conducted in the most appropriate way; patients should adhere to instructions from the healthcare provider regarding sample collection, transportation, and tests. At times, a patient may not need to adhere to any condition recommended. In case there are instructions to guide patients on how to handle samples, there could be diet recommendations, predetermined time for sample collection, and cleaning procedures. For instance, fasting is recommended for tests involving glucose because consuming food and drinks at certain time may interfere with the lab results. Again, there are instances when a patient can only take water without any other food or drink to limit digestion that could impact test outcome. Taking tea, fruit juice or coffee can lead to digestion, which affect the medical tests. Doctors should advise patients

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

appropriately about the meals needed and medication permitted before sample collection.

There are medical tests that need specific instructions with regard to preparation for sample collection; these include glucose tolerance, serum lipids, creatinine, and fecal occult blood tests. For glucose tolerance, a patient may need to fast prior to the sample collection. In glucose tolerance tests; fasting and two-hour post-prandial blood glucose tests, patients are expected to adhere to meal scheduling program. Serum lipid tests may need patients to fast for 9-12 hours; the test include cholesterol and triglycerides. In creatinine tests, patients are not recommended to consume cooked meat because it may raise creatinine levels. A fecal occult blood test also requires patients to observe certain food programs, as well as medications. In urine culture, patients are recommended to either take water 15 minutes before sample collection or refrain from urinating a few hours before urine sample is collected. Also, the 5-HIAA measurement require patients to refrain from certain food such as kiwi fruit, bananas, walnuts, eggplant, tomatoes, and pineapples; patients are advised to avoid taking listed foods three days before the urine sample is collected. There are drugs that interfere with 5-HIAA test results, therefore the doctor should advise appropriately. Cortisol tests are another category of medical test that require specific instruction such as resting before sample collection. In cases where saliva sample is needed, patients are recommended not to consume food or brushing their teeth before the sample is taken for lab tests. In Pap smear tests, women will be advised not to engage in sex for 48 days before sample collection, not to book an appointment while on mensuration, and not to use vaginal creams.

There are other medical tests that do not require patients to adhere to specific instructions. The tests include complete blood count (CBC), which measures the number of red and white blood cells, as well as hemoglobin level among other substances. The CBC test is conducted to diagnose cancers, infections, and anemia. Again, in metabolic panel, patients may not need adherence to certain preset conditions. The metabolic panel is used to measure heart, kidney, and liver functions. Metabolic panel tests are recommend for patients with long-term illness that need regular checks to understand treatment progress. Physicians need to understand the changes in in measurements of analytes to help make accurate decision regarding current treatment. For example, cortisol levels in normal people vary from those patients suffering from Cushing's syndrome. In those suffering from Cushing's syndrome, the cortisol level stays stable throughout the day instead of shifting from high to low as seen in normal individuals. Cortisol facilitates the homeostasis of glucose and is generated in the adrenal cortex. The level rises in the system to its peak in the midday, and fluctuates to its lowest level from 8 pm up to 12 am. The cortisol level can inform doctors about the drugs to help patients.

Poor disease diagnosis has had health and economic implications to patients. In several cases, unnecessary testing of patients has led to psychological problems, and the patients may have to use a lot of resources to follow-up with the tests. Healthcare providers have the role of ensuring accurate, yet timely diagnosis is conducted. Also, a test should only be permitted if there are unlikeliness the test will have medically significant impact on the patient's treatment. When initiating the diagnosis, patients are advised to provide honest information regarding medical histories such as family history of the condition. Besides, inaccurate tests can result in false-positive that link to delays and annulment of treatments, as well risk to patients. The approach to reducing these challenges is to ascertain the necessity of the medical test in the first place before recommending it. In the process of diagnosis, doctors should have full details regarding patients' adherence to recommended instructions. It is also important to have patients deliver reliable information about sample collection for dependable lab results and treatment. In a nutshell, provision of wrong information and pre-analytics lab test instructions can jeopardize the results. The aim of this research therefore is to investigate the influence of communication skills on lab test results at KAMC. As such, the research question formulated to guide the study is:

- Are communication skills influencing lab test results at KAMC?

2. Literature Review

Communication refers to the process of transmitting diverse forms of messages using multiple approaches including verbal and non-verbal; it involves two or more people having a face-to-face conversation or through written and recorded information. Communication has been proven the most crucial tool in the healthcare system because it promote inter-professional relations towards improved outcomes.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

The therapeutic relationships established between healthcare professionals, and their clients have been noted to enhance clinical practice and improve treatment outcomes (John, 2007). Again, physician-patient communications are invaluable asset for accurate diagnosis because the patient is comfortable to share personal information. Doctors can adopt the partnership model to give patients equal opportunities during conversation, thus promoting self-expression. However, Mutha (2002) proposed the RESPECT model as an accurate tool for enhancing cultural awareness. The model has seven primary elements including rapport, empathy, support, partnership, explanations, cultural competencies and trust. Communication is important for improving inter-personal relationship, sharing information, and critical decision-making. L.M.L (1995) noted that medical decisions need collaboration between healthcare providers to ensure effective outcomes.

Communication effectiveness during interactions between physicians and patients can determine the outcome of treatments. Wanzer (2004) argued that good communication practice can impact the outcomes of patient treatment. Patients with good understanding of the physicians are more likely to cooperate, adhere to instructions, and accept recommended therapeutic alternatives. The possibility of attaining positive experience begins with good communication that promote relationship building and possible behavioral orientation. John (2007) added that patients are likely to commit to treatment programs if they trust physicians, which begins with effective communication. Several studies have confirmed the need for effective communication between healthcare providers and patients supported by education and intervention for adherence. Kelly (2009) noted that physician-patient communication is key to treatment adherence and success. Hall and colleagues (1998) carried out a meta-analysis to understand different outcomes associated to physician communication; the study found that treatment adherence was correlated to communication between the physician and the patient. In another study, Rainer S Beck utilized a systematic review of literature from 1975-2000; the study focused on interactions between primary care physicians and patients. It was found that factors such as empathy, reassurance, friendliness among other factor contributed to positive treatment outcomes.

Non-verbal communication practices such as nodding of the head, leaning forward, uncrossing of the legs; direct orientation of the body, and less mutual gaze are fundamental in clinical communication aimed towards improved relationship between physicians and patients. James (2013) proposed that improved communication guarantees least of medical malpractices and diagnosis errors. C. Rogers believed that empathic communication is invaluable for patient-physician relationship and therapeutic practices (Anfossi, 2004). However, a classical definition of empathy offered by C. Truax details the concept as an accurate perception of clients' feelings and attuning communication to show understanding of the client situation (Kilszcz, 2006). Several researchers including Hojat (2002) have argued that empathy is both a skill and an attitude towards other people's feelings and the associated reasons. Empathy assists physicians to gain effective communication between themselves and the patients. This, in turn creates a rapport facilitating positive outcomes. Empathy is a skill that physicians need to possess allowing recognition of patient's emotions that are not overtly expressed but can influence the treatment outcome (Hojat, 2002). Recognition of patients' emotions is crucial for treatment; therefore physicians need to explore it for improved outcomes.

Moreover, physicians should focus on symptoms and patient emotions during their interactions. John (2007) proposed that physicians should keenly observe patients' emotions during the diagnosis besides the lab tests. Often, physicians and clinicians need lab tests to diagnose, treat and manage patients' conditions. Frank (2009) added that collection of samples for lab tests should be conducted with proper identification of samples for testing. Harmsen (2005) added that effective physician-patient communication resulting in information sharing and mutual understanding between physician and patients can improve consultation and physical examination activities. Laboratory results are delivered to patients during subsequent visits to the hospital with proper discussion on appropriate treatment. Patients can improve the treatment adherence with adequate communication of the lab results, as well relationship. Van Wieringen (2002) proposed that proper communication promotes compliance and satisfaction with medical services. The laboratory has critical role in the patient care process through its provision of the medical data needed for

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

diagnosis and treatment. Clinical laboratories are sufficient in ensuring there are interconnections between diverse departments in the healthcare system; physicians, nurses and lab technicians coordinate toward patient treatment based on lab results (Rodriguez, 2005; Holdcraft, 2005). In another study by Arnaout (2011), laboratories were found to play critical function in affirming the possibility of an illness, thus giving an overhead to treatment needed, as well monitoring of disease.

The probability of diagnosis a certain disease following a clinical suspicion is high in medical practice. Fahim (2014) found that clinical suspicion and lab test results are determined by age, previous lab results and diagnosis. The correlation between clinical suspicion and lab test results can be utilized to improve the testing processes by properly estimating the probability of the test results. Fahim (2014) argued that finding the probability of a certain medical test result being positive important in lowering the risks associated to the tests. In certain cases, patients may receive false positive results that need follow-ups. The process of following up to know about false positive results may cost time and other resources. Zhi (2013) argued the burden of false positive results of patients are severe, and physicians should only conduct test with certain probability based on clinical suspicion. Rodriguez (2005), posited that lab results are important medical data that promote health and welfare of patients. It is important therefore to have patients educated about the lab report to help relate to their conditions. Physician communication is the most critical element when sharing medical information with the patient, which does impact treatment outcomes. According to L.M.L (1995), physicians should use effective communication strategies to share information with patients by acknowledging cultural values, language and ethnic diversity among other factors. Harmsen (2005) argued that physician and patients can develop perceived bias against each other, thus impacting physician communication. In other studies by Hagihara (2006) and Van Dulmen (2002), patients and physicians had diverse expectations based on communication effectiveness, which was related to mutual understanding between the parties. Mutual understanding is therefore a key aspect of effective communication within the clinical settings.

In clinical settings, physician communication is a critical element that determines the outcome of investigation, thus influencing overall outcomes. According to Street (1991) and Smith (1981), understanding between physician and a patient determines the realization of positive outcomes. Young (1988), proposed methods such as rationing, control education, support decision system; protocol, case note appraisal and feedback as investigative approaches in clinical settings. Doctors can order tests that are not appropriate based on their deficiency of experience, routine therapeutic practice; guidelines and protocols, unawareness of examination costs (Wong, 1983; Young, 1988; Hindmarsh, 1996). According to Van Walraven (1998), and Young (1988), the ordering of unjustified clinical tests is inconvenient to patients because it will require follow-ups to confirm the credibility of the results.

Healthcare system has suffered economic loses attributed to poor diagnostic services, therefore, physicians are called upon to be vigilant when checking for probability in test results being positive/negative. The waste of healthcare resource is largely associated to clinical tests that are inappropriately ordered; this weakens the quality of healthcare services. According to Young (1988), unsuitable testing is limiting to the effective outcomes in treatment because there may arise inefficient prescription attributed to poor lab test results. In a study by Joon Lee (2015), irrelevant lab test results have critical impact on the medical services provided to a client. It is critical to have patient deliver truthful information to help determine best investigation approach in understanding their illness. Empathic communication is needed to initiate a collaborative environment for treatment; patient can freely share medical information (AACL, 2016). A physician can determine best treatment after diagnosing in the most recommended alternative, and aim to gain positive health outcomes.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

3. Research Model and Hypotheses

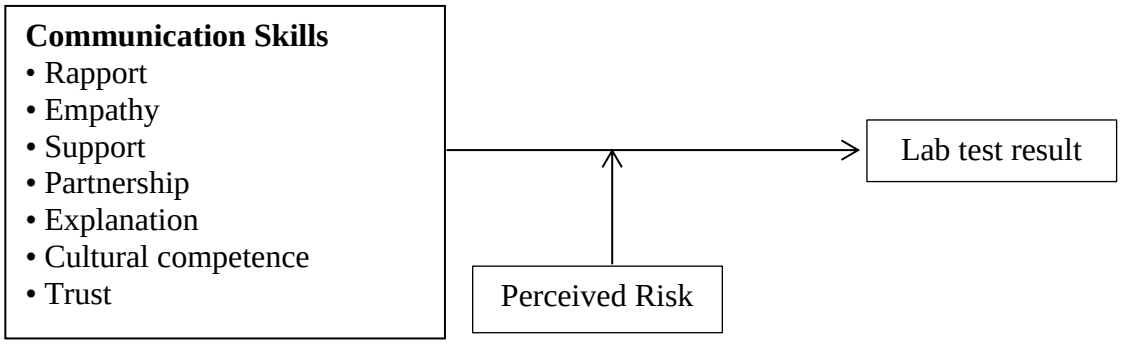

Figure 1 Research Model

4. Research Methodology

The researchers used a descriptive-analytical research design to test the correlation hypothesis between dependent and independent variables. The hypotheses were formulated inductively from observation and the literature reviewed. The analytical section includes the research model that was tested by evaluating the impact of instructions given to patients before lab tests on the outcome of these tests.

The independent variables tested in this research included rapport, empathy, support, partnership, explanation, cultural competence, and trust, while the dependent variable was lab test results. Also, a cross-section survey was used by sampling healthcare providers randomly at KAMC; this was a single cross-sectional design. The study population is the healthcare providers at KAMC who work in the lab diagnostics section. The hospital has 950 physicians, 30 lab technicians, and 1521 nurses. However, after working out, a sample size of 290 individuals was surveyed.

Over 245 healthcare providers, including physicians, phlebotomists, and nurses, completed the survey accounting for 84% of the total sample size. The researchers used a quantitative survey to understand the research question comprehensively.

A research questionnaire was used to collect the primary data for analysis. The researchers also utilized the 5-point Likert scale to evaluate the responses; the Likert scale ranges from 1-5, where 1 is for strong disagreement and 5 for strong agreement with the questions on the questionnaire.

Reliability

The researchers used Cranach's Alpha of 0.874, which indicated that there was high reliability in individuals' answers, as seen in Table 1

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
.874	28

5. Results

5.1 Demographic Data Results

Table 2: Frequency and percentage of demographic information

		Frequency	Percentage
Age	Less than 30	36	14.7
	30-40 years	106	42.9
	41-50 years	99	40.4
	More than 50 years	4	1.6
	Total	245	100
Gender	Male	99	40.4

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

	Female	146	59.6
	Total	245	100.0
Educational Level	Secondary school or less	1	.4
	Diploma	1	.4
	Bachelor's Degree	165	67.3
	Postgraduate Degree	78	31.8
	Total	245	100.0
Nationality	Saudi	164	66.9
	Non-Saudi	81	33.1
	Total	245	100.0
Job title	Physician	129	52.7
	Medical Technologist	22	9.0
	Nurse	93	38.0
	Others	1	.4
	Total	245	100.0

Table 2 shows that: The percentage for "age" highest reached (42.9%) for the age category between 30-40 years, but the lowest percentage reached (1.6%) for the age category more than 50 years. Concerning "gender", the measurement reached (59.6%) for (females), while males reached (40.4%). The percentage for the highest "education level" reached (67.3%) for (Bachelor's degree). However, for Secondary and Diplomas reached (0.4%). Concerning "nationality," the **RAPPORT** measurement was (66.9%) for (Saudis) while for (Non-Saudi) it reached (33.1%). Lastly, the percentage for "Job title" reached (52.7%) for (physicians), but the lowest percentage for others reached (0.4%).

5.2 Descriptive Analysis (Communication skills related factors) Independent Variables Tests (Mean, SD)

Table 3: Mean and standard deviation for items and Chi-Square test

No.	Items	Mean	S.D	Order	Overall mean	Chi-square	P value
1	Connecting with the patient, their social level	4.04	0.89	3	Agree	228,5	0,000
2	Understanding the patient, their point of view	4.26	0.82	1	Agree	139.7	0.000
3	Recognizing and avoiding making Assumptions	4.08	0.96	2	Agree	253.4	0.000
RAPPORT		**4.13**	**0.89**		**Agree**		

Table 3 shows that the mean ranges between (4.04-4.26), the highest mean for item (2). The highest mean was for the first item, "Understanding patient's point of view," while the first item, "Connection at the patient's social level was the lowest. The overall mean for "Rapport" was (4.13), representing overall agreeability. The chi-square test was completed at a significant level of 0.05 for all items.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

EMPATHY

Table 4: Mean and standard deviation for items and Chi-Square Test

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Remembering that the patient has come to you for help.	4.47	0.91	Totally agree	2	248.56	0.000
2	Conveying empathy to your patient regarding their problem.	4.33	0.59	Totally agree	4	90.47	0.000
3	Identifying and pursuing verbal cues given by your patient.	4.48	0.53	Totally agree	1	110.85	0.000
04	Identifying and pursuing non-verbal cues given by your patient.	4.34	0.64	Totally agree	3	178.82	0.000
EMPATHY		**4.41**	**0.67**	**Totally agree**			

Table 4 shows that the mean range is between (4.48-4.33), with the highest mean for the item (3), "Identifying and pursuing verbal cues given by your patient, at 4.48. The lowest mean was item (2), "Conveying empathy to your patient regarding their problem at 4.33. The overall mean for "Empathy" (4.41) with totality in agreement. The Chi-square test in the table for all items had a significant level of 0.05.

SUPPORT

Table 5: Mean and standard deviation for items and Chi-Square Test

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Asking about and trying to understand barriers to care and compliance.	4.49	0.50	Totally agree	2	119.52	0.000
2	Helping the patient to overcome barriers.	4.53	0.53	Totally agree	1	114.62	0.000
3	Involving family members if appropriate.	4.46	0.62	Totally agree	3	83.08	0.000
Support		4.49	0.55	Totally agree			

Table 5 shows that the mean ranges between (4.53-4.46) with the highest mean for the item (2), "Helping the patient to overcome barriers," while the lowest mean was for item (3), "Involving family members if appropriate." The mean for "Support" was (4.49) with total agreement.

The Chi-square test in the table shown was for all items with a significant level of 0.05.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

PARTNERSHIP:

Table 6: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Being flexible concerning issues of control	4.38	0.51	Totally agree	2	132.50	0.000
2	Negotiating roles when necessary	4.32	0.59	Totally agree	3	88.51	0.000
3	Stressing that you will be working together with them to address medical problems	4.55	0.59	Totally agree	1	366.49	0.000
PARTNERSHIP		4.42	0.56	Totally agree			

Table 6 shows that the mean ranges between (4.55-4.32), with the highest mean for the item (3), "Stressing that you will be working together with him/her to address medical problems," while the lowest mean was for the item (2) " Negotiating roles when necessary" with totality in agreeability. The overall mean for "Partnership" was (4.2) with total agreement.

The Chi-square test includes all items tested at a significant level of 0.05.

EXPLANATION

Table 7: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Checking often for understanding	4.56	0.51	Totally agree	1	123.24	0.000
2	Using verbal clarification techniques	4.55	0.51	Totally agree	2	119.94	0.000
EXPLANATION		4.56	0.51	Totally agree			

Table 7 shows that the mean ranges (from 4.56-4.55), with the highest mean for item (1), " Checking often for understanding," while the lowest mean for the item (2), " Using verbal clarification techniques," with totality in agreeing. The overall mean for "Explanation" was (4.56) with totality in agreeing.

The Chi-square test was for all items with a significant level of 0.05.

CULTURAL COMPETENCE:

Table 8: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Respecting the patient's culture and beliefs	4.69	0.45	Totally agree	2	97.30	0.000

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

2	Being aware of your own biases and preconceptions	4.80	0.59	Totally agree	1	30.10	0.000
3	Knowing your limitations in addressing medical issues across the cultures	4.33	0.53	Totally agree	3	43.90	0.000
CULTURAL COMPETENCE		4.61	0.52	Totally agree			

Table 8 shows that the mean ranges between (4.80-4.33) with the highest mean for the item (2), "Being aware of your own biases and preconceptions," while the lowest mean for item (3), " Knowing your limitations in addressing medical issues across the cultures" with total agreeing. The overall mean for "Cultural Competence" was (4.61) with the answer total agreeing.

The Chi-square test in the table shows that all items had a significant level of 0.05.

Trust

Table 9: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order	Chi-Square	P.value
1	Being aware of building trust with patients.	4.68	0.47	Totally agree	2	8.07	0.000
2	Being attentive and positively greeting the patient.	4.82	0.43	Totally agree	1	69.100	0.000
3	Giving a reasonable time expectation.	4.30	0.74	Totally agree	3	8.40	0.000
Trust		**4.60**	**0.55**	**Totally agree**			

Table 9 shows that the mean ranges between (4.82-4.30) with the highest mean for item (2), "Being attentive and positively greeting the patient," while the lowest for the item (3), " Giving a reasonable time expectation," with answer agree. The overall mean for "Trust" was (4.60) with the answer agree.

The Chi-square test in the table showed that all items had a significant level of 0.05.

LABORATORY TEST RESULTS

Table 10: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order
1	Giving a good introduction will help the healthcare provider to give good lab test results	4.59	0.95	Totally agree	1
2	Spending good time with patients will help the healthcare provider to give good lab test results	4.38	0.99	Totally agree	3
3	Giving enough explanation to patients will help the healthcare provider to give good lab test results	4.41	0.67	Totally agree	2

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

4	Giving good communication to patients will help Healthcare provider to give good lab test results	4.33	0.90	Totally agree	4
5	Laboratory tests are normally repeated	3.68	1.09	Agree	5
6	Laboratory tests are rarely repeated	2.78	0.86	Neutral	6
7	Laboratory tests are never repeated	2.09	1.00	I do not agree	7
LABORATORY TEST RESULTS		**3.75**	**0.92**	**Agree**	

Table 10 shows that the mean ranges between (4.59-2.09) with the highest mean for item (1), "Giving good introduction will help Healthcare provider to give good lab test results," while the lowest mean was for the item (7), " Laboratory tests are never repeated" with answer agree. The overall mean for "Laboratory test results" was (3.75) with the answer agreeing.

The Chi-square test in the table indicated that all items had a significant level of 0.05.

Perceived risk items

Table 11: Mean and standard deviation for items

No.	Items	Mean	S.D	Overall mean	Order
1	Functional — unsatisfactory outcomes.	4.21	0.77	Totally agree	4
2	Financial — monetary loss, unexpected extra costs	4.25	0.89	Totally agree	3
3	Time - wasted time	4.85	0.87	Totally agree	1
4	Physical — personal injury	4.01	0.95	Totally agree	5
5	Psychological — fears and negative emotions	4.68	0.89	Totally agree	2
Perceived Risk		**4.40**	**0.82**	**Totally Agree**	

Table 12: Differences between age groups in independent Variables:

ANOVA						
		Sum of Squares	df	Mean Square	F	p-value
Rapport	Between Groups	1.899	3	.633	.134	.940
	Within Groups	1135.412	240	4.731		
	Total	1137.311	243			
Empathy	Between Groups	152.487	3	50.829	14.652	.000
	Within Groups	832.575	240	3.469		
	Total	985.061	243			
Support	Between Groups	53.912	3	17.971	8.376	.000
	Within Groups	514.940	240	2.146		
	Total	568.852	243			
Partnership	Between Groups	27.879	3	9.293	5.008	.002
	Within Groups	445.334	240	1.856		
	Total	473.213	243			
Explanation	Between Groups	23.325	3	7.775	8.890	.000
	Within Groups	209.904	240	.875		
	Total	233.230	243			

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

Cultural Competence	Between Groups	16.193	3	5.398	4.392	.005
	Within Groups	294.954	240	1.229		
	Total	311.148	243			
Trust	Between Groups	29.644	3	9.881	6.190	.000
	Within Groups	383.126	240	1.596		
	Total	412.770	243			
Perceived risk	Between Groups	27.526	3	8.145	5.411	.002
	Within Groups	311.264	240	2.263		
	Total	383.780	243			
Laboratory test results	Between Groups	122.536	3	40.845	2.481	.062
	Within Groups	3951.214	240	16.463		
	Total	4073.750	243			

Table 12 shows the differences between age groups using the ANOVA test, which helps find these differences. Considering the p-value for sex axes with a p-value less than (0.05) indicated statistical differences between age groups in these axes at 0.05. However, there were no statistical differences between age groups in axes (Rapport and Laboratory test results) at (0.05).

Table 13: Differences between gender groups in independent Variables:

		Mean	Std. Deviation	T	p-value
Rapport	Female	11.0505	1.98141	-9.030	0.000
	Male	13.2877	1.78097		
Empathy	Female	16.8081	2.01867	-5.432	0.000
	Male	18.1781	1.81064		
Support	Female	12.3333	1.11575	-12.585	0.000
	Male	14.2603	1.25975		
Partnership	Female	12.4444	1.25537	-8.542	0.000
	Male	13.8151	1.19772		
Explanation	Female	8.4848	.78719	-9.668	0.000
	Male	9.5205	.87272		
Cultural Competence	Female	14.3535	.95097	1.501	0.135
	Male	14.1438	1.23171		
Trust	Female	13.5960	1.15987	-2.308	0.022
	Male	13.9726	1.37938		
Laboratory test results	Female	26.2525	3.39971	-.042	0.966
	Male	26.2740	4.51438		

Table 13 shows the differences between genders using an independent sample t-test to find these differences according to the p-value for each axis. The axes with p-value less than (0.05) indicated statistical differences between genders in these axes at 0.05. But there were no statistical differences between gender in axes (Cultural Competence and Laboratory test results) at (0.05).

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

Table 14: Differences between educational level groups in independent Variables:

ANOVA						
		Sum of Squares	Df	Mean Square	F	p-value
Rapport	Between Groups	575.497	3	191.832	81.907	.000
	Within Groups	564.437	241	2.342		
	Total	1139.935	244			
Empathy	Between Groups	424.829	3	141.610	60.875	.000
	Within Groups	560.624	241	2.326		
	Total	985.453	244			
Support	Between Groups	201.940	3	67.313	43.936	.000
	Within Groups	369.227	241	1.532		
	Total	571.167	244			
Partnership	Between Groups	203.795	3	67.932	60.751	.000
	Within Groups	269.487	241	1.118		
	Total	473.282	244			
Explanation	Between Groups	76.465	3	25.488	38.882	.000
	Within Groups	157.984	241	.656		
	Total	234.449	244			
Cultural Competence	Between Groups	32.085	3	10.695	9.234	.000
	Within Groups	279.115	241	1.158		
	Total	311.200	244			
Trust	Between Groups	35.741	3	11.914	7.549	.000
	Within Groups	380.357	241	1.578		
	Total	416.098	244			
Laboratory test results	Between Groups	485.415	3	161.805	10.825	.000
	Within Groups	3602.340	241	14.947		
	Total	4087.755	244			

Table 14 shows the differences between education levels in axes through the Anova test, considering a p-value for each axis was less than (0.05); this indicated statistical differences between axes at 0.05.

Table 15: Differences between nationality groups in independent Variables:

		Mean	Std. Deviation	T	p-value
Rapport	Saudi	12.2561	2.48584	-1.618	0.107
	Non-Saudi	12.6420	1.24808		
Empathy	Saudi	17.7317	2.16808	1.306	0.193
	Non-Saudi	17.4074	1.63384		
Support	Saudi	13.4329	1.50309	-0.695	0.488
	Non-Saudi	13.5802	1.58796		
Partnership	Saudi	13.2622	1.46058	0.016	0.987
	Non-Saudi	13.2593	1.25277		
Explanation	Saudi	9.1524	.97575	1.141	0.256
	Non-Saudi	9.0000	.98742		
Cultural Competence	Saudi	14.3963	1.20132	3.744	0.000
	Non-Saudi	13.8889	.88034		

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

Trust	Saudi	14.3659	1.07979	11.901	0.000
	Non-Saudi	12.7160	.99039		
Laboratory test results	Saudi	26.4878	3.18449	1.022	0.309
	Non-Saudi	25.8148	5.48888		

Table 15 shows the differences between nationality in axes using an independent sample t-test to find these differences with a p-value for each axis (cultural competence and trust) at a p-value less than (0.05), which indicated statistical differences between individuals' answers in these axes at 0.05. However, there are no statistical differences between individuals' nationality in other sex axes at (0.05) level.

Table 16: Differences between job title groups in independent Variables

ANOVA						
		Sum of Squares	df	Mean Square	F	p-value
Rapport	Between Groups	133.445	3	44.482	10.651	.000
	Within Groups	1006.490	241	4.176		
	Total	1139.935	244			
Empathy	Between Groups	292.647	3	97.549	33.933	.000
	Within Groups	692.806	241	2.875		
	Total	985.453	244			
Support	Between Groups	73.792	3	24.597	11.919	.000
	Within Groups	497.375	241	2.064		
	Total	571.167	244			
Partnership	Between Groups	54.266	3	18.089	10.404	.000
	Within Groups	419.015	241	1.739		
	Total	473.282	244			
Explanation	Between Groups	36.247	3	12.082	14.691	.000
	Within Groups	198.202	241	.822		
	Total	234.449	244			
Cultural Competence	Between Groups	57.433	3	19.144	18.181	.000
	Within Groups	253.767	241	1.053		
	Total	311.200	244			
Trust	Between Groups	11.579	3	3.860	2.299	.078
	Within Groups	404.519	241	1.679		
	Total	416.098	244			
Laboratory test results	Between Groups	446.927	3	148.976	9.861	.000
	Within Groups	3640.828	241	15.107		
	Total	4087.755	244			

Table 16 shows the differences between job titles in axes using the Anova test to find these differences with a p-value for each axis less than (0.05), thus indicating there are statistical differences between job titles in axes at 0.05, except (Trust), whose p-value was greater than (0.05).

The researchers used the Pearson correlation and Chi-square test to answer the hypotheses as follows:

- A significant positive relationship exists between rapport and lab test results at KAMC.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Rapport	4.13	0.89	.354**	0.000	830.94	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (Rapport and Lab test result) according to a p-value of Pearson correlation (0.000) less than (0.01) and its value (0.354), thus indicating that there is a significant positive relationship between (rapport and lap test result) at 0.01 level.

We accept the hypotheses that a significant positive correlation exists between rapport and lab test results at 0.01 level in KAMC.

- A significant positive relationship exists between empathy and lab test results at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Empathy	4.41	0.67	.154*	0.016	569.725	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (Empathy and Lab test result) with a p-value of Pearson correlation (0.000) less than (0.05) and its value (0.154), which indicate a significant positive correlation between (empathy and lap test result) at 0.05 level.

We accept there was a significant positive relationship between empathy and lab test results at 0.05 in KAMC.

- A significant positive relationship exists between support and lab test results at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Support	4.49	0.55	0.120	0.062	656.417	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (support and Lab test result) at a p-value of Pearson correlation (0.062) greater than (0.01) and a value (0.120) that indicate a positive non-significant relationship between (support and lab test result) at 0.01 level.

We accept the existing non-significant positive relationship between support and lab test results at a confidence level of 0.05.

- There was a significant positive relationship between partnership and lab test results at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Partnership	4.42	0.56	.447**	0.000	568.182	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (partnership and Lab test results) at a p-value of

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

Pearson correlation (0.000) less than (0.01) and a value (0.447), indicating a significant positive relationship between (partnership and lap test result) at 0.01 level.

We accept the hypothesis that a significant positive relationship exists between partnership and lab test results at 0.01.

- There was a significant positive relationship between the explanation and lab test results at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Explanation	4.61	0.52	0.090	0.161	528.369	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (explanation and Lab test result) at a p-value of Pearson correlation (0.161) greater than (0.01) and value of (0.090), indicating a positive non-significant relationship between explanation and lap test result at 0.01 level.

We accept there was a non-significant positive relationship between the explanation and lab test result at 0.01.

- There was a significant positive relationship between cultural competence and lab test result at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Cultural competence	4.60	0.55	.537**	0.000	534.025	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (Cultural competence and Lab test result) with a p-value of Pearson correlation (0.000) less than (0.01) and a value (0.537), indicating a significant positive relationship between (Cultural competence and lab test result) at 0.01 level.

We accept the existence of a significant positive relationship between cultural competence and lab test result at a confidence level of 0.01.

- There was a significant positive relationship between trust and lab test results at KAMC.

Variable	Mean	Std. deviation	Pearson correlation		Chi-square	
			value	p-value	Value	p-value
Trust	3.75	0.92	0.004	0.946	580.41	0.000
Lab test result	3.75	0.92				

The table above shows the relationship between (Trust and Lab test results) at a p-value of Pearson correlation (0.946) greater than (0.01) and a value of (0.004), indicating a positive non-significant relationship between trust and lab test result at 0.01 level.

We accept there was a significant positive relationship between trust and lab test results at a confidence level of 0.01.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

6. Research Discussion

The demographic data results show that the highest rate of individuals belongs to the age group of 30-40 years (42.9%); this is the fact that this age range is considered to be in the youth stage. Most individuals are female (59.6%), and most have achieved a Bachelor's Degree (67.3%). In terms of nationality, the majority of the individuals are Saudi (66.9%). The most common job title is a physician (52.7%), which may be attributed to the research on laboratory skills. Based on Likert scale measures, the overall mean of rapport was 4.13, which shows general agreement regarding the rapport. Notably, the item "Understanding patient, his/her point of view" showed the highest level of agreement.

The overall mean for rapport was (4.13) for the Likert scale measures, indicating a general agreement about rapport. The item "Understanding patient, his/her point of view" had a higher agreeability than other items. The overall mean of empathy was (4.41) with a Likert scale measure indicating general total agreeability with empathy. The item "Identifying and pursuing verbal cues given by your patient" had a higher agreeability than other items.

The overall mean for support was (4.49) for the Likert scale measures indicating total general agreement about support. The item "Helping the patient to overcome barriers" was highly agreed to than other items. The overall mean for partnership was (4.42) with Likert scale measures indicating the total general agreement about partnership. The item "Stressing that you will be working together with him/her to address medical problems" had a high agreeability than other items.

The overall mean for an explanation was (4.56) considering a Likert scale measure indicative of total general agreement about the explanation. The item "Being aware of your own biases and preconceptions" had a high agreement than other items. The overall mean of Cultural competence was (4.61) with Likert scale measures indicating total agreement about Cultural competence. Another item, "Being aware of your own biases and preconceptions," had a higher agreement than other items.

The overall mean for trust was (4.60) with a Likert scale measure indicating a total agreement about trust. Exactly item "Being attentive and positively greeting the patient" With more highly agree than other items. The overall mean for Laboratory test results was (3.

75) with a Likert scale measure indicating total agreement about the results. Lastly, "Giving a good introduction will help Healthcare providers to give good lab test results" had a higher agreeability than other items.

The study found statistical differences between age groups in all sexes except (Rapport and Laboratory test results) at a confidence level of 0.05. Again, there were statistical differences between gender in all sexes except (Cultural Competence and Laboratory test results) at a confidence level of 0.05. Also, there were statistical differences between educational levels in all sexes at a confidence level of 0.05. The researchers found statistical differences between individuals' answers in (cultural competence and trust) at a confidence level of 0.05. However, there were statistical differences between job titles in all sexes at a confidence level of 0.05, except for the independent variable, trust.

7. Research Conclusion

The research found that empathy is a multidimensional concept that varies among healthcare providers at KAMC (physicians, medical technologists and nurses). The providers practiced advanced empathic communication skills among them and the patients regarding their lab test results affecting their satisfaction. Also, the study found that interpersonal relationships between healthcare providers at KAMC and patients involved social and emotional needs satisfaction for patients. Healthcare providers showed the ability to establish rapport with patients dependent upon individual communication skills. However, a lack of supportive communication between the patients and healthcare providers impacted medical laboratory tests. Healthcare providers were found to perceive challenges differently depending on workloads, lack of training courses about handling patients emotionally, the attitude of the patient, as well as the hospital's policies and inappropriate environment.

The healthcare providers at KAMC can build a partnership between them and the patients regarding the lab test results and treat patients with justice while negotiating on lab tests. The healthcare providers had

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

shown the ability to explain the instruction before any lab test by using verbal communication techniques while checking if clients understood. KAMC employers keenly focus on communicating with people with disabilities, patients with diverse languages, and low literacy levels. It was noted that healthcare providers at KAMC deliver the highest quality of care to every patient while checking their lab test reports regardless of race, ethnicity, cultural and language know-how. Lastly, the relationship between patients and healthcare providers cannot be built during clinical lab tests. A lack of trust during these processes is attributed to the negative attitudes of top managers and administrators. The task-based services and holistic approach required of healthcare providers affect their behavior. Healthcare providers must put much effort into establishing a positive relationship with their patients; the healthcare providers at KAMC will least involve in lab test errors attributed to effective communication.

8. Recommendations

It is recommended that KAMC motivates employees to practice empathic communication, thus encouraging performance; provision of high-quality health care services. The hospital should involve an educational program to promote effective communication toward rapport. Also, periodic workshops on communication skills should be established to promote supportive communication based on emotional and informational support that helps the patient. Doctors should overcome barriers and involve family members. It will be crucial to survey the patient about their opinion concerning communication skills within clinical settings. Lastly, evaluating the staff yearly regarding their communication skills is important. The quality assurance committees should be held to check for design systems that facilitate explaining to the patients according to cultural competence and education level.

References

[1] Anfossi M, Numico G. Empathy in the doctor-patient relationship, J ClinOncol, 2004.

[2] Anne Langsted, Jacob J. Freiberg and Børge G. Nordestgaard, Fasting and Nonfasting Lipid Levels Influence of Normal Food Intake on Lipids, Lipoproteins, Apolipoproteins, and Cardiovascular Risk Prediction , 2008.

[3] David H. Thom and Bruce Campbell. "Patient-physician trust: an exploratory study." Fahim Mohammad, Jesse C. Theisen-Toupal , Ramy Arnaout; Advantages and Limitations of Anticipating Laboratory Test Results from Regression- and Tree-Based Rules Derived from Electronic Health-Record Data, 2014.

[4] Journal of Family Practice, Feb. 1997.

[5] Frank H. Wians, Jr., Ph.D., MT (ASCP), DABCC, FACB; Clinical Laboratory Tests: Which, Why, and What Do The Results Mean? 2009.

[6] Garg R1, Shen C2, Sambamoorthi N3, Kelly K1, Sambamoorthi U1; Type of Multimorbidity and Patient-Doctor Communication and Trust among Elderly Medicare Beneficiaries, 2016.

[7] Hagihara A, Tarumi K. Doctor and patient perceptions of the level of doctor explanation and quality of patient-doctor communication. Scand J Caring Sc, 2006.

[8] Hindmarsh J T, Lyon A. W. Strategies to promote rational clinical chemistry test utilization. ClinBiochem 1996.

[9] Hall JA, Roter DL, Katz NR. Meta-analysis of correlates of provider behavior in medical encounters. Med Care. 1988.

[10] Harmsen JAM, Bernsen RMD, Meeuwesen L, et al. Assessment of mutual understanding of physician patient encounters Development and validation of a mutual understanding scale (MUS) in a mutual cultural general practice setting. Patient Educ and Couns, 2005.

[11] Hojat M, Gonnella JS, NascaThJ, Mangione S, Vergare M, Magee M. Physician empathy: definition, components, measurement and relationship to gender and specialty. Am J Psychiatry. 2002.

[12] Holdcraft S. Bridging the gap between laboratory and nursing: Helpful hints for effective communication. Lab Med. 2005.

[13] Ian J Litchfield*, Louise M Bentham, Richard J Lilford and Sheila M Greenfield Test result communication in primary care: clinical and office staff perspectives, 2014.

ISSN: 2309-5288 (Print)
ISSN: 2309-6152 (Online)
CODEN: JCLMC4
Journal of Coastal Life Medicine

[14] Jerry Hurst, MA; Karen Nickel, PhD; Lee H. Hilborne, MD, MPH, Are Physicians' Office Laboratory Results of Comparable Quality to Those Produced in Other Laboratory Settings? 1998.

[15] James T. Hardee & Frederic W. Platt, Exploring and overcoming barriers to clinical empathic communication, 2013.

[16] Joan L. Boyd, Ph.D., MT (ASCP); 1 John M. Hazy, Ph.D.; 2 Salvatore A. Sanders, PhD1, Communicating and Understanding Laboratory Test Results: What Matters? 2007.

[17] JoonLeeEmail author and David M. Maslove; Using information theory to identify redundancy in common laboratory tests in the intensive care unit, 2015.

[18] Kelly B. HaskardZolnierek and M. Robin DiMatteo; Physician Communication and Patient Adherence to Treatment: A Meta-analysis, 2009.

[19] Khromova V, Gray TA, Learning needs in clinical biochemistry for doctors in the foundation. Ann ClinBiochem. 2008.Kliszcz J1, Nowicka-Sauer K, Trzeciak B, Nowak P, Sadowska A. Empathy in health care providers--validation study of the Polish version of the Jefferson Scale of Empathy, 2006.Litchfield IJ1, Bentham LM2, Lilford RJ3, McManus RJ4, Greenfield SM2.; Patient perspectives on test result communication in primary care: a qualitative study, 2015.

[20] Matthew Wade1, Smita Baid1, Karim Calis2, Hershel Raff3, Ninet Sinaii4 and Lynnette Nieman1Technical details influence the diagnostic accuracy of the 1 μg ACTH stimulation test, 2009.

[21] Mutha S, Allen C, and Welch M. Toward culturally competent care: a toolbox for teaching communication strategies.San Francisco (CA): Center for the Health Professions, University of California, San Francisco, 2002.

[22] Ong LML, de Haes JCJM, Hoos AM, et al. Doctor-patient communication :A review of the literature. SocSci Med. 1995.

[23] Paolo Carraro, Mario Plebani, Errors in a Stat Laboratory, 2007.

[24] Paul Bowie ,Lyn Halley, John McKay, and Laboratory test ordering and results management systems: a qualitative study of safety risks identified by administrators in general practice, 2014.

[25] Rainer S. Beck, Rebecca Daughtridge, Philip D. Sloane; Physician-patient communication in the primary care office: A systematic review.

[26] Rodriguez FH Jr. ASCP President's Message: Whom do we serve? 2005.

[27] Street RL Jr. Information-giving in medical consultations: The influence of patient's communicative styles and personal characteristics, 1991.

[28] Van Dulmen AM. Different perspectives of doctor and patient in communication. International Congres Series. 2002.

[29] Van Eck, Marleen MS; Berkhof, Hans MS; Nicolson, Nancy Ph.D.; Sulon, Jose Ph.D., The Effects of Perceived Stress, Traits, Mood States, and Stressful Daily Events on Salivary Cortisol.1996.

[30] Van Walraven C, Naylor C D. Do we know what inappropriate laboratory utilization is? A systematic review of laboratory clinical audits. JAMA 1998.

[31] VanWieringen JCM, Harmsen JAM, Bruijnzeels MA. Intercultural communication in general practice. Eur J Public Health. 2002.

[32] Wanzer MB1, Booth-Butterfield M, Gruber K, Perceptions of health care providers' communication: relationships between patient-centered communication and satisfaction, 2004.

[33] Winkens R, Dinant G J. Evidence base of clinical diagnosis: rational, cost effective use of investigations in clinical practice. BMJ 2002.

[34] Wong E T, McCarron M M, Shaw S T., Jr Ordering of laboratory tests in a teaching hospital. Can it be improved? JAMA 1983.

[35] Young D W. Improving laboratory usage: a review. Postgrad Med J 1988.

[36] Zhi M, Toupal-Theisen J, Feigl-Ding EL, Whelan J, Arnaout R; The Landscape of Inappropriate Laboratory Testing: A 15-Year Systematic Review and Meta-Analysis, 2013.