Clinical Case Reports: Open Access

Research | Vol 4 Iss 4
ISSN: 2582-5038
https://dx.doi.org/10.46527/2582-5038.198

Clinical and Laboratory Diagnosis of Diseases: Experience in Resource-Poor Setting

Rex Friday Ogoronte A Ijah[1], Nkem M Onodingene[2*], Friday E Aaron[3], Christie N Mato[4] and Chimezu Alikor[5]

[1]Lecturer, PAMO University of Medical Sciences, & Consultant General Surgeon, Rivers State University Teaching Hospital, Nigeria

[2]Lecturer, PAMO University of Medical Sciences, & Consultant Hematologist, Rivers State University Teaching Hospital, Nigeria

3Senior Lecturer, Rivers State University, & Consultant Orthopedic and Trauma Surgeon, Rivers State University Teaching Hospital, Nigeria

[4]Professor of Anesthesia and Former Provost College of Health Sciences, University of Port Harcourt, & Pioneer Dean, Faculty of Clinical Sciences (on Sabbatical), PAMO University of Medical Sciences, Nigeria

[5]Medical Officer, Health Crest Specialist Hospital, Nigeria

[*]**Corresponding author:** Onodingene NM, Lecturer, PAMO University of Medical Sciences, & Consultant Hematologist, Rivers State University Teaching Hospital, Nigeria, Tel: +2348033421235; E-mail: nkemsinachi.o@gmail.com

Received: October 23, 2021; **Accepted:** November 02, 2021; **Published:** November 09, 2021

Abstract

Background: Application of clinical symptoms and signs in the diagnosis of diseases is more often emphasized in resource-poor setting like ours, where the luxury of laboratory investigations and technology may in some circumstances be unavailable. This study aims to evaluate the extent of application of clinical and laboratory information in the Diagnosis and Treatment of Diseases through the experiences of Medical Practitioners in Port Harcourt, Nigeria in the year 2021.

Materials and Methods: A cross-sectional descriptive study was carried out among medical doctors in Port Harcourt to evaluate the extent of application of clinical and laboratory information in the Diagnosis and Treatment of Diseases. Using the multistage sampling technique, 500 semi-structured questionnaires were distributed and 498 were retrieved. Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

Results: One hundred and fifty-nine (31.9%) respondents used social media platform "some of the time" to do urgent diagnosis and treatment of diseases. Three hundred and three (70.9%) respondents had used only history and examination findings for diagnosis and treatment of diseases in urgent remote community setting. Two hundred and thirty (46.2%) respondents reported mostly positive outcome. About 10% of respondents had encountered medico-legal issues following this practice.

Citation: Ijah RFOA, Onodingene NM, Aaron FE, et al. Clinical and Laboratory Diagnosis of Diseases: Experience in Resource-Poor Setting. Clin Case Rep Open Access. 2021;4(4):198.

A statistically significant p<0.05 (p=0.010) relationship was observed between number of years in service and positive outcome experienced.

Conclusion: There is a one in ten chance of being involved in some form of medico-legal issues following exclusive use of clinical history and examination findings in the diagnosis and treatment of diseases in our environment.

Keywords: ***Clinical; Laboratory; Diagnosis & treatment; Application; Port Harcourt; Nigeria***

1. Introduction

Most actions taken by humans are based on their understanding of the reasons, circumstances, and principles that explain observed phenomena [1,2]. Such was the case when the theory of demon causation of diseases led to the practice of incantation, exorcism, etc. [3]; the understanding of germ theory of diseases gave birth to antiseptic practices [4]; and recently knowledge of the pathology of coronavirus disease led to the observance of COVID-19 protocols of prevention and control [5,6]. The use of patients clinical history, examination and laboratory tests have come to stay as evidence-based mode of making diagnosis of diseases [7-9]. A good interpretation of a thoughtfully-taken history with full physical examination is therefore key to reliable disease diagnosis [10,11].

Application of clinical symptoms and signs in the diagnosis of diseases is more often emphasized in resource-poor setting like ours where the luxury of laboratory investigations and technology may in some circumstances be unavailable [12,13]. In a study evaluating the value placed on the three components of the diagnostic process, history-taking was valued at 59.3%, physical examination was rated 19.8%, while laboratory / imaging investigations was 20.9% [14]. However, some have opined that over 80% of disease diagnosis are made from the clinical history [8, 15]. Spot diagnosis, subject to confirmation has also been used in medicine in teaching and in the care of patients [16-18]. This is based on a keen sense of observation, which is a component of clinical examination. However, the 21st century has brought with it some innovations that have impacted on medical practice [19-22]. Some of these innovations reported in the literature include information & communication technology, epigenetics, molecular medicine, systems approach focused on wellness, etc.

All medical practitioners, by virtue of their training, are aware of the need to obtain and utilize information from clinical history, clinical examination, and laboratory investigations for the diagnosis and treatment of diseases. However, the physician in resource-poor setting encounters situations where this traditional teaching is put to test, (when patients are unable to afford the needed investigations) and he/she has to decide between doing “what is right” (insisting on the investigations - which may not be done) like a robot, and using just the knowledge of clinical features - through intelligent guess - to help a patient in need of medical care on compassionate grounds. This implies that laboratory investigations would not have been done before medications are administered.

There are practical experiences in our environment where some patients under the care of a medical doctor, are unable to pay for needed medical care (including laboratory tests) due to lack of insurance coverage and paucity of funds [23-26]. Customized patient care has been advocated in some setting [27-31], how far can the concept of customized patient care be stretched to

assist a patient in need with the potential risk of medico-legal implications in the future? Are there consequences (to patient and the physician) for deviating from the tripod traditional routine of clinical history, examination and laboratory investigations, based on the experiences of medical practitioners in Port Harcourt? The aim of this study, therefore, was to evaluate the experiences of Medical Practitioners on the extent of application of clinical and laboratory information in the diagnosis of diseases in Port Harcourt, Nigeria from May to August 2021.

2. Materials and Methods

2.1 Study area

The study was carried in Port Harcourt the capital of Rivers State, being one of the Niger Delta states in the Federal Republic of Nigeria

2.2 Study sites

The general meetings of the Nigerian Medical Association and the Association of General and Private Medical Practitioners of Nigeria, Clinics and Departmental grand rounds in public tertiary health facilities in Port Harcourt were the study sites.

2.3 Research design

A cross-sectional descriptive study.

2.4 Study population

The study was carried out among a cross-section of medical doctors in Port Harcourt.

2.5 Sample size determination

The minimum sample size was determined using the formula for survey developed by Yaro Yamen based on estimated population of medical doctors in Port Harcourt estimated to be 4,000 obtained from the Nigeria Medical Association Secretariat. $n = \frac{N}{1+Ne^2}$ = where n = minimum sample size, N = Total population size (of Doctors) and e = desired precision/level of significance, usually 5% (0.05) at 95% Confidence Interval (CI). Hence, we have n = 4,000; 1+4,000 × 0.052 = 363.6 being approximately 364. To cater for 10% non-response, we have 10% of 364 = 36; 364 + 36 = 400. Thus, about 500 questionnaires were distributed to survey participants.

2.6 Study instrument

Self-administered semi-structured questionnaires were used for data collection for the study.

2.7 Sampling Method

The multistage sampling method was used to collect samples from medical doctors at health facilities and meetings who gave consent for inclusion in the study. Two groups of medical doctors were identified: those working in private and in public hospitals. The private medical doctors were served the questionnaires at meetings using the systematic sampling method (every other doctor) available. The same applied to medical doctors in public hospitals who work in primary and secondary healthcare centres. A list of departments was made for medical doctors in public tertiary health institutions (teaching hospitals), and the

random sampling method was used to select a day from Monday to Friday for each Department for questionnaire administration. Medical doctors found on those days were served questionnaires to make up the minimum sample size.

2.8 Data analysis

Information on socio-demographics, use of clinical and laboratory information in the diagnosis & treatment of oncologic, non-oncologic, "urgent" conditions (when separated by distance, using social media like WhatsApp, Facebook, etc.), and challenges encountered, were collated and analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

2.9 Validity/Reliability of instrument

The study instrument was scrutinized by all authors, pre-tested in a similar work environment and corrections made before commencement of study. The Cronbach alpha (in SPSS) was used for the validity of the study instrument.

3. Results

Out of a total of 498 respondents in the study, 280 (56.2%) were male and female respondents were 218 (43.8%) as shown in TABLE 1. Three hundred and twenty-six (65.5%) respondents were aged 25 - 40 years. Two hundred and fifty-four (51.0%) respondents were single and 240 (48.2%) were married. Four hundred and seventy-eight (96.0%) were Christian. Two hundred and eighty-five respondents had spent between one and ten years in service. While 291 (58.4%) respondents worked in public health facility as place of practice, 186 (37.3%) worked in both private and public facility.

TABLE 1. **Socio-demographic characteristics of respondents (n = 498).**

Variables	Frequency	Percentage
Sex		
Male	280	56.2
Female	218	43.8
Age		
Less than 25 years	98	19.7
25- 40 Years	326	65.5
41 - 60 years	70	14.1
More than 60 years	4	0.8
Marital Status		
Single	254	51.0
Married	240	48.2
Separated	4	0.8
Religion		
Christianity	478	96.0
Islam	14	2.8
Others	6	1.2
Number of Years in Practice		

Less than a year	94	18.9
1 - 10 years	285	57.2
11 - 20 years	94	18.9
21 - 30 years	24	4.8
More than 30 years	1	0.2
Category of respondents		
Medical Officer	206	41.4
Registrar	135	27.1
Senior Registrar	105	21.1
Consultant	48	9.6
Medical Director	4	0.8
Place of practice		
Private	21	4.2
Public	291	58.4
Both	186	37.3

TABLE 2 shows that 159 (31.9%) of respondents used social media platform "some of the time" to do urgent diagnosis and treatment of diseases, while 221 (44.4%) did not use it at all. Two hundred and fourteen (43.0%) respondents accented to sometimes using phone calls to carry out urgent diagnosis and treatment of diseases, while 190 (38.2%) rarely did that. Three hundred and three (70.9%) respondents had used only history and examination findings for diagnosis and treatment of diseases in urgent remote community setting, while 107 (21.5%) had not.

TABLE 2. **Experiences on the Use of Only Clinical Information (Clinical History and Examination) in the Diagnosis and Treatment of Patients (n = 498).**

Variables	**Frequency**	**Percentage**
Frequency of using social media platform to do urgent diagnosis and treatment of diseases		
All of the time	8	1.6
Most of the time	9	1.8
Some of the time	159	31.9
Rarely	101	20.3
Not at all	221	44.4
Frequency of using phone call to carry out urgent diagnosis and treatment of diseases		
All of the time	7	1.4
Most of the time	11	2.2
Some of the time	214	43.0
Rarely	190	38.2

Not at all	76	15.3
Being in urgent situation where history and examination findings only was used for diagnosis and treatment in remote community setting		
Yes	353	70.9
No	107	21.5
Sometimes	38	7.6

TABLE 3 shows that 233 (46.8%) of respondents always use triple assessment in oncology disease diagnosis all the time, while 109 (21.9%) use it most of the time. Out of the those who never use triple assessment in oncologic disease diagnosis only 2 persons said it was due to insufficient knowledge and training. Three hundred and sixteen (63.5%) had not used only history and examination findings in the diagnosis oncology diseases. Thirteen (2.6%) respondents used only history and clinical examination findings all the time, while 24 (4.8%) used it most of the time. Those that used only history and examination findings in the diagnosis of oncologic diseases said they did so for indigent patients (29 = 5.8%), as a temporary measure (157 = 31.5%), and 49 (9.8%) did that when time (i.e. urgency) was of the essence. Although 396 (79.5%) respondents had not used phone calls or social media platform to do urgent diagnosis (and treatment) of oncologic diseases, 64 (12.9%) had done so in the past.

TABLE 3. **Experiences in the use of Clinical and Laboratory Information in the Diagnosis and Treatment of Oncologic Diseases (n = 498).**

Variables	**Frequency**	**Percentage**
Frequency of using triple assessment (history, physical findings and histology/cytology) in oncology disease diagnosis		
All of the time	233	46.8
Most of the time	109	21.9
Some of the time	87	17.5
Rarely	58	11.6
Not at all	11	2.2
Reason for not using triple assessment at all		
Insufficient knowledge and training	2	0.4
None	496	99.6
Use only history and examination findings in the diagnosis oncology diseases		
Yes	131	26.3
No	316	63.5
Sometimes	51	10.2
Frequency of using only history and examination findings in the diagnosis of oncologic diseases		
All of the time	13	2.6

Most of the time	24	4.8
Some of the time	101	20.3
Rarely	142	28.5
Not at all	218	43.8
Why always using only history and examination findings in the diagnosis of oncologic diseases		
For indigent patients	29	5.8
As a temporary measure	157	31.5
When time (urgency) is of the essence	49	9.8
None	263	52.8
Use phone calls or social media platform to do urgent diagnosis (and treatment) of oncologic diseases		
Yes	64	12.9
No	396	79.5
Sometimes	38	7.6

TABLE 4 shows the challenges encountered after usage of only clinical history and examination in the diagnosis and treatment of patients. Two hundred and thirty (46.2%) respondents reported mostly positive outcome from use of only history and examination findings, 202 (41.2%) had mixed negative (both negative and positive), while 8 (1.6) respondents had mostly negative outcome. One hundred and twelve (22.5%) respondents had used only history and examination findings for diagnosis and treatment of metabolic disease, skin diseases and infections, while 426 (85.5%) had not.

Evaluation of the level of satisfaction expressed by medical practitioners using a scale of 1 - 10 showed that most respondents indicated satisfaction levels of 5 (100 = 20.1%), 6 (140 = 28.1%), 7 (106 = 21.3%) following use of only clinical history and examination for the diagnosis and treatment of diseases. About 10% of respondents had encountered medico-legal issues following this practice.

TABLE 4. **Challenges Encountered after Usage of Only Clinical History and Examination (and/or examination only) in the Diagnosis and Treatment of Patients (n = 498).**

Variables	**Frequency**	**Percentage**
Outcome experienced from use of only history and examination findings in the treatment of diseases		
Always positive	29	5.8
Always negative	5	1.0
Mostly positive	230	46.2
Mostly negative	8	1.6
Mixed Outcome	205	41.2
None	21	4.2

Types of disease diagnosed and treated with only clinical history and examination findings		
Cancer Cases	20	4.0
Metabolic disease	50	10.0
Skin disease	37	7.4
Infections	79	15.9
Cancer and Metabolic disease	22	4.4
Metabolic, Skin disease and Infections	112	22.5
Metabolic disease and Infections	116	23.3
All of the above	32	6.4
None	30	6.0
Medico-Legal Issues / Encounters from the Short-comings of Use of Only Clinical Information in the Diagnosis of Disease		
Yes	54	10.8
No	426	85.5
Sometimes	18	3.6
Expressed satisfaction in the use of only clinical information in the diagnosis of diseases on a scale of 1 - 10		
One	9	1.8
Two	8	1.6
Three	26	5.2
Four	66	13.3
Five	100	20.1
Six	140	28.1
Seven	106	21.3
Eight	36	7.2
Nine	5	1.0
Ten	2	0.4

TABLE 5 shows the relationship between number of years in service and outcome experienced from use of only history and examination findings in the treatment of diseases. Relatively positive or better outcome was recorded with increase in years of service, as exemplified by mostly positive outcome of observed in (32 = 34.0%) respondents with less than a year in service, but (15 = 62.5%) observed among respondents with 21-30 years in practice. This relationship was statistically significant $p<0.05$ ($p=0.010$).

TABLE 5. **Relationship between number of years in practice/service and outcome experienced from use of only history and examination findings in the treatment of diseases (n = 498).**

Outcome experienced from use of only history and examination findings in the treatment of diseases									
Years in practice / service	**Always positive**	**Always negative**	**Mostly positive**	**Mostly negative**	**Mixed Outcome**	**None**	**Total**	**(X^2)**	**P-Value**
Less than a year	3(3.2%)	1(1.1%)	32(34.0%)	4(4.3%)	47(50.0%)	7(7.4%)	94		
1 - 10 years	16(5.6%)	4(1.4%)	133(46.7%)	4(1.4%)	120(42.1%)	8(2.8%)	285		
11 - 20 years	5(5.5%)	0(0.0%)	49(52.1%)	0(0.0%)	36(38.3%)	4(4.3%)	94	37.414	0.010
21 - 30 years	5(20.8%)	0(0.0%)	15(62.5%)	0(0.0%)	2(8.3%)	2(8.3%)	24		
More than 30 years	0(0.0%)	0(0.0%)	1(100.0%)	0(0.0%)	0(0.0%)	0(0.0%)	1		
Total	5	230	8	205	21		498		

TABLE 6 shows the relationship between number of years in practice/service and encounters with medico-legal issues from the short-comings of using only clinical information in the diagnosis/treatment of disease. The occurrence of medico-legal issues decreases with number of years in service. Although this relationship was not statistically significant $p>0.05$ ($p=0.084$). However, it is noteworthy that those who had spent between 21 - 30 years in service did not even have a single case of medico-legal issue whereas those with less than 10 years of experience had significant encounters of medico-legal issue.

TABLE 6. **Relationship between number of years in Practice/Service and Encounters with Medico-legal Issue from the Short-comings of Use of only Clinical Information for Diagnosis & Treatment of Disease.**

Encountered medico-legal issue from the short-comings of using only clinical information in the diagnosis/treatment of disease						
Years in Practice/Service	**Yes**	**No**	**Sometimes**	**Total**	**(X^2)**	**P-Value**
Less than a year	9(9.6%)	82(87.2%)	3(3.2%)	94		
1 - 10 years	37(13.0%)	238(83.5%)	10(3.5%)	285		
11 - 20 years	7(7.4%)	83(88.3%)	4(4.3%)	94	13.899	0.084
21 - 30 years	0(0.0%)	23(95.8%)	1(4.2%)	24		
More than 30 yr	1(100.0%)	0(0.0%)	1(100.0%)	1		
Total	54	426	18	498		

4. Discussion

The need to strike a balance between undertaking a good medical practice (making diagnosis and treatment of diseases) in low-income setting in the twenty-first century (with digital communication and social media) and avoiding the undesirable setback of medico-legal issues is the high-point of this discussion. Our study shows that most of the respondents were aged 25-40 years, and majority were Christians. This age range typifies the productive workforce in Nigeria [32]. More than half of the respondents had spent between one and ten years in service (or post graduate residency training), and also more than half worked in public health facilities. This implies that respondents had enough wealth of experience to contribute to the subject matter, and the predominance of Christian respondents reflects the area where the study was carried out - Port Harcourt in Southern Nigeria [33,34].

About a quarter of respondents used social media "some of the time", and nearly half of respondents asserted to using phone calls for the diagnosis and treatment of diseases. However, in urgent remote community setting about two-thirds of respondents had used only history and examination findings for diagnosis and treatment of diseases. The challenging issue is that the use of these communication media sometimes does not afford the physician the needed physical contact with patient, for detailed clinical history and examination for diagnosis. The implication of this is that the quality of the presumed diagnosis is likely to be reduced and with a high potential for errors. Additionally, the component of laboratory confirmation is also missing, thereby reducing the quality or correctness of the diagnosis made. However, advocacy for positive aspect of social media has been made for prevention, diagnosis, and treatment of specific conditions and disorders from involvement of older adults in online social support network [35]. Other positive use of social media in clinical practice has been reported in pathology [36], and dermatology [37,38].

About half of respondents used triple assessment for the diagnosis of oncology diseases "all the time", implying that the reverse is the case at some other times. Although majority of respondents asserted to not using only history and examination findings in the diagnosis oncology diseases, a few had done so, and for some others - all of the time. Despite the intention, this highlights the risk associated with this practice to the patient and the physician for a potential wrong diagnosis. Meanwhile, those who did so stressed that it was restricted to indigent patients, as a temporary measure, when time was of the essence. One wonders if the practice is worth the risk involved, with the plethora of negligence (gross, ordinary, slight) [39-41], and also the fact that one cannot outrightly determine the outcome of such matters from the expanded duties of a medical practitioner [39]. Similar thoughts have been emphasized in previous reports [42,43]. Hence, the wise thing for a medical practitioner to do would be to guided and guard against them [39].

Positive outcome following the use of only clinical history and examination findings in the diagnosis and treatment of patients was reported by nearly half of respondents, while a large number of others had a mixed outcome. The likelihood for a positive outcome in a low-income environment seems to be the driving force sustaining this practice. This usage was for non-oncologic diseases, and respondents' satisfaction levels rated on a scale of 1 to 10 was 5, 6, and 7 for most respondents. The relative satisfaction of some physicians with the practice could be the second reason for the persistence of this short-cut measure. Unfortunately, one-tenth of respondents had medico-legal issues following usage of only clinical history and examination findings in the diagnosis of diseases. This risk varies from one country to another, and also from one specialty to another [44]. The awareness of this potential risk should serve as a deterrent, even in resource -poor settings, despite the strength of evidence

adduced to clinical symptoms and signs in previous reports [8,14,15]. Although in an emergency situation, treatment may be started on strong evidence from history and examination, laboratory findings must be added for conclusive evidence. The paper, therefore, showcases and emphasize the importance of laboratory and imaging support for history and clinical examination in order to have a balanced patient evaluation. As challenging as this could be, it should also be emphasized even in critical patient care when patients still experience funding difficulties in our environment [26]. Moreover, in training centres (teaching hospitals), lack of laboratory and imaging support for diagnosis would be a source of frustration for trainees.

Relatively positive or better outcome was seen, and a statistically significant relationship was observed between number of years in service and outcome experienced from use of only history and examination findings in the treatment of diseases. The implication of this finding is that years of experience in practice / service plays pivotal role in the usefulness of only history and examination findings in the treatment of diseases for positive outcome. It was also observed that encounters with medico-legal issues from the short-comings of using only clinical information in the diagnosis/treatment of disease tend to reduce with number of years in practice/service, although the relationship between the two were not statistically significant.

5. Conclusion

The triple evaluation tool of the physician, for various reasons, was not used all the time. Majority of medical practitioners have used incomplete history and examination findings for the diagnosis and treatment of clinical conditions through phone call, short message services or social media services. About ten percent of respondents have reported encounters with medico-legal issues following this practice. It is therefore safe to conclude from the foregoing, that there is a one in ten chance or likelihood of being involved in some form of medico legal issues following exclusive use of clinical history and examination findings in the diagnosis and treatment of diseases in our environment. This risk appears to be less likely with increasing years of experience/practice.

6. Acknowledgement

We acknowledge the effort of medical practitioners in Port Harcourt – old and young – for painstakingly making available their valued experiences during data collection that gave birth to this study.

7. Ethical Statement

The approval of the research ethics committee of the Rivers State University Teaching Hospital was obtained before the study was done.

8. Funding

The Study was privately sponsored by the researchers.

9. Conflict of Interest

None

REFERENCES

1. Alvarez M. Reasons for action, acting for reasons, and rationality. Synthese. 2018;195(8):3293-310.
2. Everson S. What are reasons for action? In: Sandis C, editor. New essays on the explanation of action. London: Palgrave Macmillan, UK; 2009. 22-47 p.
3. Feezer L. Theories concerning the causation of disease. Am J Public Health. 1921;11(10):908-12.
4. Casanova J-L, Abel L. The genetic theory of infectious diseases: a brief history and selected illustrations. Annu Rev Genomics Hum Genet. 2013;14:215-43.
5. Adhikari SP, Meng S, Wu Y-J, et al. Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. Infect Dis Poverty. 2020;9(1):1-12.
6. Organization WH. Key messages and actions for COVID-19 prevention and control in schools. 2020.
7. Muhrer JC. The importance of the history and physical in diagnosis. Nurse Pract. 2014;39(4):30-5.
8. Hampton JR, Harrison M, Mitchell JR, et al. Relative contributions of history-taking, physical examination, and laboratory investigation to diagnosis and management of medical outpatients. Br Med J. 1975;2(5969):486-9.
9. Carter J, Müller-Stöver I, Östensen H, et al. Good clinical diagnostic practice. World Health Organization. 2005:220.
10. Llewelyn H, Ang HA, Lewis K, et al. Oxford handbook of clinical diagnosis. Oxford: Oxford University Press, UK; 2014.
11. Lundy CT. Recent Advances in Paediatrics-23. Ulster Med J. 2007;76(1):62-3.
12. Oyedokun A, Adeloye D, Balogun O. Clinical history-taking and physical examination in medical practice in Africa: still relevant? Croat Med J. 2016;57(6):605-7.
13. Soltani A, Moayyeri A. Towards evidence-based diagnosis in developing countries: the use of likelihood ratios for robust quick diagnosis. Ann Saudi Med. 2006;26(3):211-5.
14. Markert RJ, Haist SA, Hillson SD, et al. Comparative value of clinical information in making a diagnosis. MedGenMed. 2004;6(2):64.
15. Summerton N. The medical history as a diagnostic technology. Br J Gen Pract. 2008;58(549):273-6.
16. Heneghan C, Glasziou P, Thompson M, et al. Diagnostic strategies used in primary care. BMJ. 2009;338:b946.
17. Stark Z, Campbell LJ, Mitchell C, et al. Spot diagnosis. New Eng J Med. 2014;370(23):2229-36.
18. Hon K-L, So K-W, Wong W, et al. Spot diagnosis: An ominous rash in a newborn. Ital J Pediatr. 2009;35(1):1-3.
19. Koop CE. Health and Health Care for the 21st Century: For All the People. Am J Public Health. 2006;96(12): 2090-2.
20. Genuis SJ. Medical practice and community health care in the 21st century: a time of change. Public Health. 2008;122(7):671-80.
21. Hood L, Balling R, Auffray C. Revolutionizing medicine in the 21st century through systems approaches. Biotechnol J. 2012;7(8):992-1001.
22. Lamster IB, Eaves K. A model for dental practice in the 21st century. Am J Public Health. 2011;101(10):1825-30.
23. Obembe T, Fonn S. Affording unavoidable emergency surgical care-The lived experiences and payment coping strategies of households in Ibadan metropolis, Southwestern Nigeria. PloS one. 2020;15(5):e0232882.
24. Anakwenze CP, Ntekim A, Trock B, et al. Barriers to radiotherapy access at the University College Hospital in Ibadan, Nigeria. Clin Transl Radiat Oncol. 2017;5:1-5.

25. Onwujekwe O, Uzochukwu B. Socio-economic and geographic differentials in costs and payment strategies for primary healthcare services in Southeast Nigeria. Health Policy. 2005;71(3):383-97.
26. Mato C, Tobin M. Out-of-pocket health expenditure: a preliminary survey of impact on households of patients in the intensive care unit of a tertiary hospital in Nigeria. Afr J Anaesth Intensive Care. 2009;9(2):1-4.
27. Zhao J, Gao S, Wang J, et al. Differentiation between two healthcare concepts: person-centered and patient-centered care. J Nurs. 2016;3(4):398-402.
28. Morgan S, Yoder LH. A concept analysis of person-centered care. J Holist Nurs. 2012;30(1):6-15.
29. Minvielle E. Toward Customized Care: Comment on "(Re) Making the Procrustean Bed? Standardization and Customization as Competing Logics in Healthcare". Int J Health Policy Manag. 2018;7(3):272-4.
30. Veazie PJ, Johnson PE, O'Connor PJ. Is there a downside to customizing care? Implications of general and patient-specific treatment strategies. J Eval Clin Pract. 2009;15(6):1171-6.
31. Minvielle E, Waelli M, Sicotte C, et al. Managing customization in health care: a framework derived from the services sector literature. Health Policy. 2014;117(2):216-27.
32. Commission NP. Nigeria demographic and health survey 2013. National Population Commission, ICF International; 2013.
33. Enyindah C, Ojule J, Bassey G. Contraception with intrauterine contraceptive device (IUCD) in Port Harcourt, South-south Nigeria. J Med Biomed Res. 2012;11(1):35-45.
34. Ihejirika WC. Muslim minorities and media access in a predominantly Christian city: The case of Port Harcourt, Nigeria. J Afr Media Stud. 2009;1(3):469-91.
35. Leist AK. Social media use of older adults: a mini-review. Gerontol. 2013;59(4):378-84.
36. Isom J, Walsh M, Gardner JM. Social media and pathology: where are we now and why does it matter? Adv Anat Pathol. 2017;24(5):294-303.
37. DeBord LC, Patel V, Braun TL, et al. Social media in dermatology: clinical relevance, academic value, and trends across platforms. J Dermatolog Treat. 2018;30(5):511-8.
38. Morris C, Scott RE, Mars M. Instant messaging in dermatology: A literature review. Stud Health Technol Inform. 2018;254:70-6.
39. Raveesh BN, Nayak RB, Kumbar SF. Preventing medico-legal issues in clinical practice. Ann Indian Acad Neurol. 2016;19(Suppl 1):S15-S20.
40. Drăghici I, Drăghici L. Medicolegal Aspects in Pediatric Minimally Invasive Surgery. In: Esposito C, Becmeur F, Steyaert H, et al., editors. ESPES Manual of Pediatric Minimally Invasive Surgery. Berlin: Springer, Germany; 2019. 71-5 p.
41. Gyoh SK. Malpractice and medico-legal issues. Ann Ib Postgrad Med. 2005;3(1):9-12.
42. Epstein JB, Sciubba JJ, Banasek TE, et al. Failure to diagnose and delayed diagnosis of cancer: medicolegal issues. J Am Dent Assoc. 2009;140(12):1494-503.
43. Malo J-W, Ghezzo H, Jocelyne L, et al. Is the Clinical History a Satisfactory Means of Diagnosing Occupational Asthma? Am Rev Respir Dis. 1991;143(3):528-32.
44. Gibbs AJ, Malyon AC, Fritz ZBM. Themes and variations: an exploratory international investigation into resuscitation decision-making. Resuscitation. 2016;103:75-81.