

The growing epidemic of Social and cultural Iatrogenesis in Pakistan

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Received: March 2021; Accepted: April 2021; Published: May 1, 2021.

Citation: Muhammad Farooq et al. The growing epidemic of Social and cultural Iatrogenesis in Pakistan. World Family Medicine. 2021; 19(5): 51-59 DOI: 10.5742/MEWFM.2021.94049

Abstract

Objective: The focus of this research was to explore the incidence of iatrogenesis due to errors by physicians, adverse drug reactions (ADRs) and unhygienic conditions in the hospital environment.

Methodology: The main hypothesis for the present study was "higher the errors in diagnosis, prescription, and adverse reactions of drugs, higher will be the risk of Iatrogenesis". Survey research was conducted by developing a questionnaire. The data was collected from 300 hospitalized and outdoor patients from hospitals of District and Tehsil Head Quarters Hospitals of Bhakkar.

Results: The value of Cronbach's Alpha for 17 items of "Iatrogenesis" is .879 which ensures the strong reliability of the tool and consistency of responses; having N =300, with a mean = 55.34 and std. deviation = 12.354. The results show that respondents are well aware that their health is more at risk because of errors in Physician's diagnosis and prescription and Iatrogenesis incidence is prevailing due to a high dosage of drug taken; adverse reactions of drugs and unhygienic conditions of hospital environment.

Conclusions: Health professionals are creating unrealistic demands for consumption of more and more medicine and medical treatment.

Key words: Iatrogenesis, Iatrogenic injury, Social Iatrogenesis, Cultural Iatrogenesis, drugs

Introduction

“Cure the disease and kill the patient”. Francis Bacon (1561-1626)

A few centuries ago, the healer was considered as god in many societies due to his role in curing a person from even those diseases which were considered incurable. But with the passage of time the professional ethics of medicalization has lost their importance and new medical values and ethics have emerged in industrialized and materialized societies where monetary profits and gains have more values for medical establishment rather than serving humanity in its real essence. With the development of medical technology, vaccination and the techniques of sterilization diseases including diphtheria, polio, syphilis; pneumonia and tuberculosis have vanished. The decrease in suffering and accredited better medical care have equated to changes in health status. These changes are variable and dependent on political and technological transformation, which is reflected in terms of what doctors do and say. As a result, “iatrogenesis” is a new disease that has emerged in the twentieth century which is recognized as a growing epidemic all over the world. Iatrogenic is a Greek word which is the combination of two words, one is *latro* and second one is *genen* or *genesis*. The word ‘*latro*’ means “Physician or Doctor” and “*Genen*” or “*genesis*” means “as a result” or origin; so iatrogenic injuries are those injuries and ailments where doctors, physicians, consultants, drugs, hospitals, diagnostics and other medical institutions act as “sickening agents” or “pathogens” (Illich, 1975); the World Health Organization defined it as a harmful, unintentional, and undesired effect of any drug (WHO, 1972). *Iatron*, is a place where doctors of prehistoric times kept their surgical and medical instruments and apparatus, attended their patients, performed operations, handled their wounds and fractures (Silva, Pacheco. 1970). Iatrogenic disease can be named and treated differently by different authors. Lacaz (1970) termed it as a man-made pathological process, drug induced disease and therapy induced disease. Iatrogenic disease should be those diseases which are only caused by doctors when, in discussion with patient, during consoling and calming them down, far from clearing it up, they unwittingly cast doubts in their mind, arousing fears, neurotic ideas and distress (Pacheco Silva 1970); while others relate it with risk associated with medical intervention and the side effects of drugs which are also termed as adverse drug reactions (ADRs).

So it can be inferred that iatrogenic injury can be the result of complications in treatment, or physician error or drug effects, or problems within the health system. It not necessary that iatrogenic events are always the result of medical errors; they may and may not be. (Sharek and Classen, 2006; Klugelman et al, 2008). Man has been aware of the perils of the doctor patient relationship since Hippocrates time when he admonished his adherent, “*Primum non nocere*” (first, do no harm). Once Napoleon expressed to a physician “I don’t want two diseases - one nature made, one doctor made”.

Literature on medical and clinical errors is sparse and symbolizes only the tip of the iceberg (Leape, 1994). Since the beginning of health and healing, thousands of medical errors which are in form of diagnosis; drug prescription, the amount of dose taken; surgeries and clinical harm; the test advised, the accuracy of results of a laboratory test and their actual understanding, have mostly gone unreported and unrecognized. The medical culture of training and practice in which health professionals are groomed has taught them that mistakes and errors are unacceptable. Leape (1994) viewed mistakes as failure of their personality whereas an error connotes their negligence. Healthcare professionals conceal their medical errors due to the fear of penalties (Dekker and Laursen, 2007). Iatrogenic events and injuries contribute significantly and alarmingly to service receiver morbidity and mortality (Kohn et al, 2000). From the perspective of professionalism, it is expected from healthcare professionals and clinicians to do their maximum effort to avoid mistakes and errors and remain vigilant regarding threats of real or possible iatrogenesis (Tomas J. Silber, 2011), and followed by apology and disclosure when errors occur. Mostly, the clinicians feel an overwhelming remorse and regret after an iatrogenic event (Hilfiker, 1984).

Hospitals are the places which are considered a major source of acquiring infection due to the contaminated hospital environment. This contamination is not only in the form of food, air, instruments, fluids, and medications but also in the form of medical personnel who may be the carriers of infections.

Extent of iatrogenesis

A renowned paper, “Error in Medicine” by Lucian L. Leape depicted that one fifth of hospital patients (Schimmel Report, 1964) while more than one third of hospitalized patients (Steel Report, 1981) experienced iatrogenic injury. Harvard Medical Practice Study Report, (1991) mentioned that 180,000 Americans die every year due to iatrogenic injuries (Brennan TA, Leape LL, Laird N, et al. 1991; Leape LL, Brennan TA, Laird N, et al. 1991). Different research shows that less than one quarter (14-25%) of the hospitalized patients had iatrogenic injury, while one third (33 %) of patients acquired iatrogenic injury over age 65 (de la Sierra et al. 1989; Sampereiz Legarre et al. 1994; Madeira et al. 2007; Mohebbi et al., 2010); more harm is brought by the pharmaceutical industry to the patients than previously thought (Angell’s, 2004); infection caused by healthcare system affects about 1.4 million patients at any given time; healthcare-associated infection affected 5%–10% of patients in developed countries, and nearly a quarter in developing countries (WHO, 2009); 5%–8% of deaths worldwide are due to ADRs (Rajesh V, 2013); many countries reported that Adverse Drug Reactions are the foremost reason of death (Shamna. M, 2014). In the USA, iatrogenic incidents and reactions of medical treatments are taking more lives than heart disease or cancer (Dale, 2015). Iatrogenic disease due to medical adverse reactions include drugs, surgery and medical accidents accounting for more than 13% of fatality rates.

Significance of the study:

This study will show that provision of healthcare is a complex system and errors associated with it can be minimized by minimizing the physician errors in diagnosis and prescription, through effective communication between healer and the patient, drugs taken and their side effects and through improving the hospital environment.

Objectives:

- To explore the incidence of iatrogenesis due to errors in diagnosis and prescription by physicians.
- To know the level of awareness that people have regarding the usage and adverse effects of medicines/ drugs and the medical care they take.
- To identify the presence of contamination in the hospital environment and its effects on risk to the human body.

Literature Review

Peer, Rafia Farooq and Shabir, Nadeem (2018) reviewed the nature, extent and distribution of healthcare hazards and established the facts that the determinants of disease are built within the health care environment so rational and well-thought-out changes in the health environment can positively impact the extent, nature and distribution of disease. Modern medicine benefitted the human by curing ailments but one should focus and address the side effects and risk associated with medication. Through literature, the researchers established the fact that nowadays modern medicine is a major threat to the human body and world health. Giardina, Claudia et al. (2018) have observed the adverse reactions of drugs in patients and commented that the patients who become victim of ADRs during hospitalization, stay longer in hospitals as compared to patients without ADRs. He concluded that ADRs are more common among females and those patients who take many medications.

Moutaouakkil, Y. et al, (2017) explained the severity of drug iatrogenesis which refers to any undesirable situation for the patients induced by use of one or more medicines which accounts for iatrogenic injuries. It is a serious health problem and should be addressed accordingly. There is a need of development of appropriate preventive strategies and their implementation for health professionals and for the patients. Bouvy J. C et al. (2015) have conducted an analysis of all epidemiological studies which were computing adverse reactions of drugs in the European region and were published between 2000-2014. This research includes three kinds of studies; firstly where patients were hospitalized due to adverse reaction of drugs; secondly, patients who became victim of adverse drugs reactions during hospitalization and thirdly, adverse drug reactions in outpatients. A review of 47 articles establishes the fact that adverse drug reactions that lead to hospitalization and those which arose during hospitalization are significant. Maaskant JM et al (2015) describes that many hospitalized patients are affected by Medication Errors (MEs) which leads to harm, discomfort and even death. These Medication errors are more hazardous and harmful

for children than adults. Tim K. Mackey (2015) explored the likely destruction or damage to the patient from the internet or related technologies which he termed as 'Digital Iatrogenesis' where patients have open access to online drugs that are injurious to health. Khaskheli M. et al (2014) have conducted research to observe the effects of iatrogenic factors and outcomes on acute maternal morbidity and mortality. The findings from this cross sectional study depict that out of 51 women admitted to ICU, 33 (64.70 %) were because of adverse effects of medical treatments and 18 (35.29%) because of Surgical issues. Out of these 51, 37(72.54%) women recovered from iatrogenic complications while 14(27.45%) expired. The major iatrogenic factors that lead to complication were errors during pregnancy, child birth and postpartum period, quantity of anesthesia and negligence and errors during blood transfusions.

Research conducted by Martins M et al. (2011) to assess the association between adverse events and deaths in Brazil illustrates that adverse events are prevalent, and lead to serious harm and even death. Mendes et al (2009) have conducted research to assess the events caused by adverse drug reactions in Brazil and describe that adverse drug events were similar at the three hospitals under study. Fantino B et al (2006) explained that iatrogenesis could be eliminated by the cognizance of general practitioners (GPs). Hierarchical logistic models were used to study the relationship between GPs behavior and patients' risk of iatrogenesis. The researcher concluded that when there is a greater risk of iatrogenesis, GPs tended to be more cautious. The classic paper "The hazards of hospitalization" by E M Schimmel (2003) highlights the hospital-induced complications and risks associated with time duration during hospitalization. Daly MP et al (1994) in his research depicts that people over the age of 65 are the victim of polypharmacy (taking more than seven drugs) which is increasing the risk of iatrogenic disease. Research by Kable AK et al (2002) in Australia on admitted surgical patients showed that 48% of Adverse Events (AEs) were preventable out of a total 14,719 medical records reviewed.

Spread of hepatitis virus is associated with iatrogenic causes but still the health professionals are reluctant to use the term iatrogenic hepatitis. Arif, I et al (2017) state iatrogenic factors like hospital admission, surgery, intravenous infusions and injections, dental procedures, birth delivery and cesarean section can be a significant risk factor among nondrug users. Mohsen A et al. (2015) state hepatitis C virus (HCV) is more common where there are health care exposures to unsafe injections and have poor infection control practices. Dore GJ, (2012) state most common risk factors for Hepatitis C in developing countries are hospital admission, blood transfusion, complicated deliveries, injection therapy, surgeries, endoscopy, and dental treatment. Medhat A, et al (2002) and Lazarou J, et al. (1998) concluded that in US hospitals the occurrence of severe and incurable adverse drug reactions were very high and estimated that in 1994 severe and incurable ADRs were the top sixth leading cause of death.

Research hypothesis

The hypotheses for the present research are:

H 1: Higher the errors in diagnosis and prescription by physician, higher will be the risk of iatrogenesis

H 1: Higher the level of the dosage of drug taken, higher will be the risk of iatrogenesis

H 1: Higher the level of adverse reactions to drugs, higher will be the iatrogenesis

H 1: More the unhygienic hospital environment, more will be the risk of iatrogenesis

Research methodology

Survey research was conducted by developing a 17- item questionnaire. Likert scale was used having the response categories from strongly agree to strongly disagree. The data was collected from 300 hospitalized and outdoor patients from hospitals of District Bhakkar. Two hundred patients were taken from District Head Quarter (DHQ) hospital Bhakkar, 100 patients were taken from three Tehsil Head Quarter (THQ) Hospitals of Mankera, Darya Khan and Kalorkot of district Bhakkar.

Frequency Distribution of Respondent by Demography:

Table 1: Socio-demographic characteristics of respondents

Characteristics	Frequency	Percentage
Gender		
Male	142	47.3
Female	158	52.7
Age		
Up to 20	14	4.7
21-30	60	20.0
31-40	104	34.7
41-50	80	26.7
51-60	29	9.7
61 & above	13	4.3
DHQ Hospitals (hospitalized patients)	100	33.3
DHQ Hospitals (outdoor patients)	100	33.3
THQ Mankera (outdoor patients)	30	10.0
THQ Darya Khan (outdoor patients)	40	13.3
THQ Kalorkot (outdoor patients)	30	10.0
Monthly Income of the family		
10,000-30,000	121	40.3
30,001-50,000	100	33.3
50,001-70,000	28	9.3
70,001-90,000	18	6.0
90,001 plus	33	11.0

Interpretation:

Table 1 shows the frequency distribution of respondents according to gender, age, hospital and income. The data shows that 158 (53.7%) female respondents participated compared to 142 (47.3%) males. In terms of hospitals, 100, 100 patients i.e. 33.3% respondents belonged to DHQ Hospitals (hospitalized patients), DHQ Hospitals (outdoor patients) respectively. 34.7%, 26.7% and 20% of the respondents have ages of 31-40, 41-50 and 21-30 respectively. In terms of income, 40.3% respondents belong to income category of 10,000-30,000 while 33.3% belong to 30,000-50,000 income categories.

Table 2: Reliability of Research tools

	Cronbach's		Mean	Std. Deviation	No. of Items
	Alpha	N			
Iatrogenesis (Total Instrument)	.879	300	55.34	12.354	17
Iatrogenesis by physician	.760	300	13.33	3.867	04
Iatrogenesis by drugs and adverse reaction of drugs	.762	300	19.47	5.074	06
Iatrogenesis by hospital environment	.847	300	22.54	6.214	07

Reliability of Research Instrument: The value of Cronbach's Alpha for 17 items of "Iatrogenesis" is 0.879 which ensures the strong reliability of the tool and consistency of responses; having N =300, with a mean = 55.34 and std. deviation = 12.354.

Table 3: Mean, Standard Deviation and Frequency Distribution of Respondents by Iatrogenic Injury due to Physician diagnosis, prescription, incomplete knowledge and incompetence

Physician	Iatrogenesis by Physician					Mean	St dev.
	SDA f (%)	DA f (%)	N f (%)	A f (%)	SA f (%)		
Errors in diagnosis	30 (10)	78 (26.0)	40 (13.3)	96(32.0)	56(18.7)	3.23	1.295
Errors in prescription	27 (9.0)	68(22.7)	46(15.3)	112(37.3)	47(15.7)	3.28	1.230
Unaware of side effects of therapy	25 (8.0)	54(18.0)	44(14.7)	105(35.0)	72(24.0)	3.48	1.263
Incompetency in managing therapy	35 (11.7)	48(16.0)	60(20.0)	97(32.3)	60(20.0)	3.33	1.283

Interpretation:

The above table shows the frequency distribution of respondents by Iatrogenic Injury due to Errors in Physician diagnosis, prescription, incomplete knowledge and incompetence. Out of 300, almost one third (33 percent) of the respondents "Agree" with the statement that they received an iatrogenic injury due to "Errors in Physician diagnosis, prescription, incomplete knowledge and incompetence" while about 17 % (47), 19 % (56) and 20 % (60) of the respondents "Strongly Agree" with the statement that they received an iatrogenic injury due to "errors in prescription of drugs", "errors in Physician diagnosis" and "physician incompetence" respectively.

Table 4: Mean, Standard Deviation and Frequency Distribution of Respondents by Iatrogenic Injury due to Drug Related Issues

Drugs	Iatrogenesis due to Drugs					Mean	St dev.
	SDA f (%)	DA f (%)	N f (%)	A f (%)	SA f (%)		
quantity of drug taken	31 (10.3)	71 (23.7)	53 (17.7)	99 (33.0)	46 (15.3)	3.19	1.249
allergic reaction to drugs	24 (8.0)	46 (15.3)	54 (18.0)	125 (41.7)	51 (17.0)	3.44	1.174
prolonged usage of any drug	27 (9.0)	75 (25.0)	49 (16.3)	99 (33.0)	50 (16.7)	3.23	1.248
drug-drug interaction	35 (11.7)	78 (26.0)	69 (23.0)	74 (24.7)	44 (14.7)	3.05	1.2250
adverse reactions of drugs	38 (12.7)	60 (20.0)	52 (17.3)	105 (35.0)	45 (15.0)	3.20	1.274
lack of awareness regarding usage of drug	28 (9.3)	66 (22.0)	49 (16.3)	85 (28.3)	72 (24.0)	3.36	1.310

Interpretation:

The above table explains the frequency distribution of respondents by Iatrogenic Injury due to Drug related issues. Out of 300, almost one third (33 percent) of the respondents "Agree" with the statement that they received an iatrogenic injury due to "quantity of the dose of drug taken, prolonged usage of drug, side effects of the drugs even having the knowledge of side effects". More than 42 % (125) of the respondents "Agree" with the statement that they received an iatrogenic injury due to "allergic reaction" of the drugs.

Table 5: Frequency Distribution of Respondents by Iatrogenic Injury due to Hospital Environment

Drugs	Iatrogenesis by Hospital environment					Mean	St dev.
	SDA f (%)	DA f (%)	N f (%)	A f (%)	SA f (%)		
unhygienic conditions	21(7.0)	62 (20.7)	53(17.7)	92 (30.7)	72 (24.0)	3.44	1.251
carriers	26 (8.7)	62(20.7)	60 (20.0)	115 (38.3)	37 (12.3)	3.25	1.171
surgical instruments used	25 (8.3)	76 (25.3)	60 (20.0)	89 (29.7)	50 (16.7)	3.21	1.229
infected food	43 (14.3)	72 (24.0)	54 (18.0)	88 (29.3)	43 (14.3)	3.05	1.297
solid waste	31 (10.3)	76 (25.3)	59(19.7)	82 (27.3)	52 (17.3)	3.16	1.270
handling of wounds/fractures	25 (8.3)	79 (26.3)	63(21.0)	98 (32.7)	35 (11.7)	3.13	1.174
complication in health system	20 (6.7)	69 (23.0)	67 (22.3)	89 (29.7)	55 (18.3)	3.30	1.201

Interpretation:

The above table shows the frequency distribution of respondents by "Iatrogenesis by Hospital environment" and depicts that 54% respondents "Strongly Agree" and "Agree" (72, 92) that they received an injury due to unhygienic conditions in hospitals, 51 % "Strongly Agree" and "Agree" that iatrogenic injury was caused due to carriers in hospital environment while about 47% of respondents strongly agree and agree that they received an iatrogenic injury due to surgical instruments.

Table 6: One-Sample t-Test

Iatrogenesis by Physician	Test Value = 16					
	T	df	Sig (2-tailed)	N	Mean	Std. Deviation
	-12.010	299	.000	300	13.3100	3.87953
Iatrogenesis by Drugs	Test Value = 24					
	T	df	Sig (2-tailed)	N	Mean	Std. Deviation
	-15.46	299	.000	300	19.4700	5.07427
Iatrogenesis by Hospital environment	Test Value = 28					
	T	df	Sig (2-tailed)	N	Mean	Std. Deviation
	-15.21	299	.000	300	22.5433	6.21371

Interpretation:

One sample test was run on Iatrogenesis by Physician, Iatrogenesis by Drugs and Iatrogenesis by Hospital environment to explore the mean of Iatrogenesis by Physician, Iatrogenesis by Drugs and Iatrogenesis by Hospital environment scores. The results show that the mean is significantly lower than test value at all levels, having df = 299, p < .001.

Ho= Male and Female have different opinion regarding iatrogenesis by physician

Ha= Male and Female have same opinion regarding iatrogenesis by physician

Ho= Male and Female have different opinion regarding iatrogenesis by drugs

Ha= Male and Female have same opinion regarding iatrogenesis by drugs

Ho= Male and Female have different opinion regarding iatrogenesis by hospital environment

Ha= Male and Female have same opinion regarding iatrogenesis by hospital environment

Table 7: Independent Samples Test by Gender

	Gender	N	Mean	Std. Deviation	t	Df	Sig. (2-tailed)
Iatrogenesisby physician	Male	142	13.1056	3.93332	-.865	298	.388
	Female	158	13.4937	3.83372			
Iatrogenesisby drugs	Male	142	19.0704	5.13871	-1.294	298	.197
	Female	158	19.8291	5.00470			
Iatrogenesisby hospital	Male	142	22.7254	6.04257	.480	298	.631
	Female	158	22.3797	6.37831			

Interpretation:

Independent Sample test was run on “Iatrogenesis by Physician”, “Iatrogenesis by adverse reactions of Drugs”, “Iatrogenesis by Hospital environment” by gender to explore the significance and the mean difference. The value indicates that there is no difference between opinion of males and females regarding the above three mentioned themes. So all H_0 are rejected hence H_a is accepted.

Table 8: ONE-WAY ANOVA by Hospitals

		Sum of Squares	df	Mean Square	F	Sig.
Iatrogenesis through physician	Between Groups	56.637	4	14.159	.940	.441
	Within Groups	4443.533	295	15.063		
	Total	4500.170	299			
Iatrogenesis through drugs	Between Groups	292.242	4	73.060	2.910	.022
	Within Groups	7406.488	295	25.107		
	Total	7698.730	299			
Iatrogenesis through hospital contamination	Between Groups	519.942	4	129.985	3.478	.009
	Within Groups	11024.495	295	37.371		
	Total	11544.437	299			

Discussion and Conclusion

The debate on “Moving from Information transfer to Information exchange” in health and healing is further elaborated by this study on iatrogenesis. Many of the adverse events today are the result of errors in doctors’ diagnosis, prescriptions, incompetence, and the way one handles and manages patients and wounds. Further, ignorance of the patient by the healthcare system, prolonged use of medicine and its side effects, and allergic reactions to drugs complicated the situation and the risk associated to life of a person is added many times. The unhygienic environment of the Pakistani hospitals, stains on the walls, availability of infected foods in hospital premises, the conditions of the laboratories and blood sample collection centers are all questionable. Iatrogenic injuries and deaths associated with them are growing day by day and no mechanism exists which tells us about the exact figures of deaths and injuries. This study opens a debate on the rights of the patients to inform about their treatment and the risk associated with their life due to specific treatments, surgeries and side effects of medicines. Patients have no

control in decision making during healing and this practice should be reversed so that iatrogenic injuries should be minimized. Many of the iatrogenic injuries and deaths can be overcome through minimizing the language barriers. Health professionals have to talk with patients in lay man language.

A National database should be developed that stores all the information regarding incidents reported in each health facility and the steps taken to deal with those issues satisfactorily. A database should be designed in such a way that cross comparison of incidents should be possible to be reported in any health facility with their diagnosis, medical prescription, lab-test suggested and the adverse reactions associated with this process. Iatrogenic Injury Surveillance Unit should be developed to monitor and to address all iatrogenic injuries and to produce high quality research that addresses the causes and provides steps to tackle this menace of iatrogenic injury. A system should be developed for provision of indemnity, legal aid and compensation to those who suffer because of health system failure or medical failure. Pharmacists have to play their role as co-drivers along with health professionals

and consultants in avoiding and preventing potential threats to health caused by polypharmacy and inappropriate drug use and their side effects. Many times patients take those medicines which may react with one another and cause iatrogenic illness.

The incidents of iatrogenesis should be considered important by ethical as well as by legal means. Health care professionals mostly don't take into account or document events or release details of an iatrogenic injury. All cases of iatrogenesis should be identified, addressed, documented and disclosure publically so that similar errors and mistakes should be overcome in the light of past experiences. It must be mandatory to inform the patients and their families about such unfortunate events and their aftermath. It helps not only the young health professionals and medical community as a whole in error free treatment but also the patients by minimizing their suffering. The government has to review preventive strategies, facilitate the environment of medical training because insufficient training may be the cause of iatrogenic injury, and develop and implement an effective healthcare system because many iatrogenic injuries occur as a result of system failures. An online database should be developed where every event and incident is reported and analyzed that gives rise to adverse medical reactions or pose a threat to a patient's life, for ensuring the reduction and elimination of risk and as a result strategies are developed and modified to reduce the incidence and severity of iatrogenic injuries. A system of transparency and accountability should also be initiated against those whose negligence leads to iatrogenic injuries and even death. A system is required where every part of the medical establishment is responsible and accountable for diagnosis, therapeutic treatment and administrative decisions.

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