ARTIGO ORIGINAL

HIV/AIDS Indicators for Clinical Care Quality Assessment: Relevance and Utility Assessed by Health Professionals

Indicadores de Qualidade para Avaliar os Cuidados Clínicos Prestados a Doentes com Infeção por VIH/SIDA: Relevância e Utilidade Avaliadas por Profissionais de Saúde

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Acta Med Port 2016 Jun;29(6):389-400 ▪ http://dx.doi.org/10.20344/amp.6360

ABSTRACT

Introduction: After conducting a systematic review of quality indicators for assessing HIV/AIDS clinical care, we aimed to assess the clinical relevance and practice utility of those indicators from the point of view of HIV/AIDS physician experts.

Material and Methods: This is an observational, cross-sectional study, in which we selected, by convenience, physicians who work in an Infectious Disease Department of a central hospital to complete two questionnaires with a core set of indicators to establish the most relevant and useful indicators for assessment of the clinical HIV/AIDS care. A Likert scale was used to rank the indicators.

Results: Eleven of thirteen physicians filled two questionnaires. From the initial list of 53 quality indicators, 21 were identified as the most relevant and useful in HIV/AIDS clinical care. The internal consistency for clinical relevance in each indicators domain was for clinical signs and symptoms (p = 0.971), for therapy (p = 0.900), for prognosis (p = 0.820) and diagnosis (p = 0.733) and for practice utility were diagnosis (p = 0.934), clinical signs (p = 0.964), laboratory examinations (p = 0.947), therapy (p = 0.583) and prognosis (p = 0.368).

Discussion: In the process of assessing the clinical relevance and practice utility of HIV/AIDS quality care indicators, it was found that the majority of physicians agreed that diagnosis and clinical symptoms and signs indicators domains are the most important for assessing the quality of care for HIV/AIDS patients.

Conclusion: This instrument should be considered as a diagnostic tool, allowing hospital administrators to identify if HIV/AIDS care is properly delivered or needs improvement.

Keywords: Acquired Immunodeficiency Syndrome; HIV Infections; Patient Care; Quality Assurance, Health Care; Quality Indicators, Health Care.

RESUMO

Introdução: Após a realização de uma revisão sistemática sobre indicadores de qualidade para avaliar os cuidados clínicos prestados a doentes com infecção VIH/ SIDA, procuramos avaliar a relevância e utilidade clínica prática desses indicadores, do ponto de vista dos médicos especialistas em doenças infecciosas, incluindo VIH/ SIDA.

Material e Métodos: Este é um estudo observacional, transversal, em que foram selecionados, por conveniência, os médicos que trabalham em um Departamento de Doenças Infecciosas de um hospital central, para responder a dois questionários, com um conjunto básico de indicadores, selecionando aqueles mais relevantes e úteis para a avaliação dos cuidados clínicos para avaliação do atendimento clínico prestado aos doentes com infeção por VIH/SIDA. A escala do tipo Likert foi utilizada para classificar os indicadores.

Resultados: Onze dos treze médicos preencheram os dois questionários. A partir da lista inicial de 53 indicadores de qualidade, 21 foram identificados como os mais relevantes e úteis para avaliar os cuidados clínicos prestados a doentes com infeção por VIH/ SIDA. A consistência interna para a relevância clínica, em cada domínio de indicadores foi quanto à relevância clínica – sinais clínicos (p = 0,971), terapêutica (p = 0,900), prognóstico (p = 0,820) e diagnóstico (p = 0,733) e quanto à utilidade prática – diagnóstico (p = 0,934), sinais clínicos (p = 0,964), exames laboratoriais (p = 0,947), terapêutica (p = 0,583) e prognóstico (p = 0,368).

Discussão: No processo de avaliação da relevância clínica e utilidade prática dos indicadores de qualidade de cuidados prestados a doentes com infeção por VIH/SIDA, descobrimos que a maioria dos médicos concorda que os indicadores dos domínios de diagnóstico, sinais e sintomas clínicos são os mais importantes para avaliar a qualidade dos cuidados clínicos prestados a doentes com infeção por VIH/SIDA.

Conclusão: Este instrumento deve servir como uma ferramenta de diagnóstico, permitindo aos administradores hospitalares identificar se os cuidados aos doentes com infeção por VIH/SIDA estão as ser devidamente prestados ou precisam de melhorias.

Palavras-chave: Assistência ao Doente; Garantia da Qualidade dos Cuidados de Saúde;Infecção por VIH; Indicadores de Qualidade em Assistência à Saúde; Síndrome da Imunodeficiência Adquirida.

INTRODUCTION

The use of quality indicators in health care systems is one of the main concerns in the quality of health services. Several authors use quality indicators to document the quality of care, determine priorities, or support quality improvement, accountability, and transparency in health care. There is an increasing interest in quality indicators due

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to health rising costs, poor quality and variations in practice, as well as the failure of health care markets[1,2] The majority of clinicians working in health facilities are being faced with the need to measure the quality of care. Hospitals face the challenge of collecting patients information, but the information is useful for producing accountability measures and promoting quality improvement.[3] Many diseases have measures that can be used to address the quality of care. Diseases such as stroke,[4] Parkinson's,[5] asthma,[6] non-small cell lung cancer,[7] or breast cancer[8] can be assessed by quality of care indicators. Indicators can also be used to assess other health status components and care procedures, such as cardiovascular care,[9] injury outcome,[10] opioid treatment programs,[11] and cancer care at the end of life.[12]

Since the start of the HIV/AIDS epidemic, UNAIDS, CDC, and other partners have been concerned with the evaluation and monitoring of the HIV infection spread, treatment and prevention.[13,14] For quality of care assessments, the core set of indicators is mostly defined for community care[15,16] with less emphasis on the hospital setting.[17] Although there are some indicators for assessing clinical care, these are mainly focused on structures and available resources,[18] as well as on consequences or related to HIV disease.[19]

In the indicator development process, one of the steps that developers have to pursue, after literature search for the already-developed indicators, is the composition of a balanced consensus group and application of structured development procedures.[20] In a previously published study, a systematic review was conducted to select the published quality indicators for assessing HIV/AIDS hospital care.[21] This work was aimed to assess the clinical relevance and practice utility of HIV/AIDS quality indicators for clinical care through HIV/AIDS physician experts.

MATERIAL AND METHODS

This is an observational, cross-sectional study, about the relevance and utility of HIV/AIDS quality indicators for the assessment of clinical care from the point of view of HIV clinical experts (infectious diseases physicians).

It were selected, by convenience, physicians who work in an Infectious Diseases Department at a central hospital in Porto (in the north of Portugal). During the Department meeting it was explained the aim and goal of this study to all 11 physicians present, and all accepted to participate.

The Department of Infectious Diseases has a centre of daily care for HIV patients, which has an average of 7000 visits per year and follows 2 300 patients; 1 900 patients are on treatment and the centre receives an average of 10 HIV/AIDS new patients per week. The centre has 27 beds in the infirmary and 6 beds in the intensive care unit.

Selection criteria: infectious diseases physicians and

Table 1 - HIV/AIDS Quality Indicators according to name, numerator and denominator (part I of III)

nº	Name	Numerator
	A. Laboratorial examinations	
1	In patients with shortness of breath at rest, have an arterial blood gas sample drawn	Number of HIV patients with shortness of breath at rest, have an arterial blood gas sample drawn during x semester
2	Proportion of HIV patients with haemoglobin documented	Number of HIV patients on ART whose haemoglobin was assessed and documented
3	Proportion of HIV patients with total lymphocyte count documented	Number of HIV patients on ART whose total lymphocyte count was assessed and documented
4	Proportion of HIV patients with absolute neutrophil count documented	Number of HIV patients on ART whose absolute neutrophil count was assessed and documented
5	Proportion of HIV patients with platelets documented	Number of HIV patients on ART whose platelet count was assessed and documented
6	Proportion of HIV patients with bilirubin documented	Number of HIV patients on ART whose billirubin was assessed and documented
7	Proportion of HIV patients with blood urea nitrogen documented	Number of HIV patients on ART whose blood urea nitrogen was assessed and documented
8	Proportion of patients with a CD4 count greater than 200 cells/ul	Number of HIV patients with a CD4 count cell greater than 200 cell/ul.
9	Creatinine	Number of HIV patients on ART whose creatinine was assessed and documented
10	Proportion of HIV patients with a chest X-ray (normal and abnormal) documented	Number of HIV patients on ART whose chest X-ray was assessed and documented
11	Perform endoscopy if patient is unresponsive to treatment	HIV patients unresponsive to treatment submitted to endoscopy

infectious disease residents working in the department of infectious diseases for more than one year caring for patients with HIV infection and who voluntarily agreed to participate in the study. Exclusion criteria: doctors who did not fill out the questionnaire. The refusal rate was zero and valid questionnaire rate for the clinical relevance questionnaire was 82% and for practice utility was 100%.

Data collect instrument: Two questionnaires were used with the same indicators structure in domains. The domains were constructed based on the function of the indicators, or on what they assess. So, if one indicator was used for the assessment of the clinical signs and symptoms we gathered them in the domain "clinical signs and symptoms", if it was for laboratory tests, we gathered in this domain, and so on. So the domains were named according to the function of clinical care used in the medical nomenclature. As such 5 domains were defined. The first, "laboratory and examinations", includes indicators that assess the laboratory tests and/ or radiology examinations. The second, "clinical signs and symptoms" includes patients complaints (symptoms) or the objective findings (signs). The third domain is "diagnosis", where indicators for the screening of specific conditions, such as opportunistic diseases that evidence advanced HIV infections; there are also conditions that the physicians must always screen. The fourth domain is "therapy", where care indicators were included, not only to assess the effects of therapy but also to assess the interventions made. The fifth domain is "prognosis" where the effects of all care in future were assessed, whether the result was the expected or not. The borders of these domains are not well defined because some of the indicators can be moved from one domain to another; therefore this model was used to easily handle all the indicators.

Data collection: Two questionnaires were constructed with 53 indicator topics selected from a previous systematic literature review[21-25] (Table 1). The purpose of one questionnaire was to assess the physician's point of view of the clinical relevance and the other one was to assess the physician's point of view on the practice utility of those indicators. Clinical relevance was defined as the extent of the information obtained through this quality indicator for understanding the quality of care provided to HIV/ AIDS patients in the hospital setting. Practice utility refers to how easy it is to use indicators to assess the everyday care given to HIV/AIDS patients in the hospital setting and might improve care. Before use, both questionnaires were validated by two physicians, that found five questions that were not clear and were corrected. After explaining the aim of this study at the meeting to the 11 physicians, self-administered questionnaires as one brochure were distributed and one week later, the questionnaires were collected.

Denominator	Eligible population/periodicity
Number of HIV patients cared for in the intensive unit	Hospitalized/ as indicated
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ annually
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients unresponsive to treatment	Hospitalized/ as indicated

Table 1 - HIV/AIDS Quality Indicators according to name, numerator and denominator (part II of III)

nº	Name	Numerator
	B. Clinical signs and symptoms	
12	Admission body mass index	Number of HIV patients whose weight was assessed on admission and registered in the chart
13	Discuss weight loss with the patient	Number of HIV patients whose weight was discussed during the last visit
14	Proportion of HIV patients with weight loss	Number of HIV patients whose weight was assessed in the last visit and showed weight loss.
15	Proportion of HIV patients with weight gain	Number of HIV patients whose weight was assessed in the last visit and showed weight gain
16	Febrile hospital days (after onset of therapy)	Number of days febrile HIV patients were in the hospital after onset of therapy before fever was documented
17	Proportion of HIV patients with CNS[1] change	Number of HIV patients who have a registered CNS change (worsened)
18	Proportion of HIV patients with complicated cough	Number of HIV patients with CD4 < 350 cell/ul who have complicated cough
19	Proportion of HIV patients with diarrhoea	Number of HIV patients with CD4 < 350 cell/ul who have diarrhoea
20	Proportion of HIV patients with lungs examined	Number of HIV patients with lung examination documented
21	Monitor the patient´s weight	Number of HIV patients with weight documented
	C. Diagnosis/ follow-up	
22	Cervical cancer screening	Number of HIV patients who were screened for cervical cancer in the last year
23	Hepatitis C screening	Number of HIV patients who were screened for hepatitis C in the last year
24	Tuberculosis screening	Number of HIV patients who have received documented screening for tuberculosis infection with any approved test.
25	Influenza vaccination	Number of HIV patients who received an influenza vaccination in the last year
26	P jiroveci pneumonia prophylaxis	Number of HIV patients with CD4 < 350 cell/ul who received *P jiroveci* pneumonia prophylaxis last year
27	Non-detectable HIV viral load	Number of HIV patients with an undetectable viral load after 48 weeks of ART
28	Proportion of patients who had a CD4 count measured at least once during the last 6 months	Number of HIV patients who had a CD4 count measured at least once during the last year
29	Proportion of patients with continued care	Number of HIV patients who had at least 2 hospital visit last year
30	HIV prevalence among pregnant women	Number of pregnant women with an HIV positive test in the last year
31	Percent of HIV-positive patients who were screened for TB in HIV care or treatment setting	Number of HIV-positive patients who were screened for TB in the HIV care or treatment setting

Denominator	Eligible population/periodicity
Number of HIV patients hospital admitted to the hospital	All HIV patients/ annually
Number of HIV patients seen in the last visit	All HIV patients/ 3 - 6 m
Number of HIV patients seen in the last visit	All HIV patients/ annually
Number of HIV patients seen in the last visit	All HIV patients/ annually
Number of HIV patients hospital admitted to the hospital	Hospitalized/ as indicated
Number of HIV patients attended to at the hospital	Hospitalized/ as indicated
Number of HIV patients with CD4 < 350 cell/ul who were attended to	All HIV patients/ 3 - 6 m
Number of HIV patients with CD4 < 350 cell/ul who were attended to	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients hospital admitted to the hospital	All HIV patients/ 3 - 6 m
Number of HIV patients seen last year	All HIV patients/ annually
Number of HIV patients seen last year	All HIV patients/ annually
Number of HIV patients not known to be infected with TB	All HIV patients/ annually
Number of HIV patients seen in the last year	All HIV patients/ annually
Number of HIV patients seen in the last year	All HIV patients/ annually
Number of HIV patients who were enrolled in ART	All HIV patients/ annually
Number of HIV patients who were enrolled in ART	All HIV patients/ annually
Number of HIV patients who were enrolled in care	All HIV patients/ annually
Number of pregnant women screened for HIV	All pregnant women/ annually
Number of HIV patients receiving care	All HIV patients/ annually

Table 1 - HIV/AIDS Quality Indicators according to name, numerator and denominator (part III of III)

nº	Name	Numerator
	D. Therapy	
32	Proportion of HIV patients with ART use	Number of HIV patients with CD4 < 350 cell/ul on ART
33	Proportion of HIV patients given treatment to reduce diarrhea	Number of HIV patients with diarrhoea who were given treatment
34	Proportion of patients on cotrimoxazole prophylaxis with at least 95% reported adherence on the last visit	Number of HIV patients with CD4 < 350 cell/ul on cotrimoxazole prophylaxis with at least 95% reported adherence on the last visit
35	Proportion of patients whose CD4 count is < 200 cell/ul who currently are on cotrimoxazole prophylactic therapy	Number of HIV patients whose CD4 count is < 200 cell/ul who currently are on cotrimoxazole prophylactic therapy
36	In patients with a CD4 count < 200 cells/microliter, prescribe an antibiotic or admit the patient to the hospital	Number of HIV patients with a CD4 count < 200 cell/microliter, prescribe an antibiotic or admit the patient to the hospital
37	Proportion of patients eligible for ARV who are currently on ARV	Number of HIV patients eligible for ARV (CD4 < 350 cell/ul) who are currently on ARV
38	Proportion of patients on ART for whom adherence is measured on the last three visits	Number of patients on ART who were assessed at the last three visits
39	Proportion of patients on ART who had registered themselves and their contact address	Number of patients on ART who had registered themselves and their contact address
40	Proportion of patients on NVP who had LFT at least once within 1 month after initiation of NVP-based ART	Number of patients on NVP who had a Liver Function Test (LFT) at least once within 1 month after initiation of NVP ART-based
41	Proportion of patients who received their fist-time CD4 count within 2 weeks after the first HIV clinic visit	Number of patients who received their fist-time CD4 count within 2 weeks after first HIV clinic visit
42	Proportion of patients with a previous ARV regimen change for whom the reason for change in the regime is documented	Number of patients with a previous ARV regimen change for whom the reason for change in the regime is documented
43	Proportions of patients on ART who are started on ART within 2 weeks after clinical eligibility is confirmed	Number of HIV patients on ART who are started on ART within 2 weeks after clinical eligibility is confirmed
44	Proportion of either bedridden or ambulatory patients who have improvement in their functional status	Number of either bedridden or ambulatory patients who have improvement in functional status
45	Proportion of patients on ARV with at least 95% (good) reported adherence on the last visit	Number of HIV patients on ART with at least 95% (good) reported adherence on the last visit
46	Proportion of HIV patients given treatment for latent TB infection	Number of HIV patients given treatment for latent TB infection
47	Proportion of HIV-positive registered TB patients given ART during TB treatment	Number of HIV patients registered as TB patients who are given ART during TB treatment
48	Percent of HIV-positive patients in HIV care or treatment (pre-ART or ART) who started TB treatment	Number of HIV-positive patients in HIV care or treatment (pre-ART or ART) who started TB treatment
49	Appropriate antiretroviral therapy	Number of HIV patients receiving ART
50	Co-management of Tuberculosis and HIV Treatment	Number of HIV patients on co-management of Tuberculosis and HIV Treatment
51	Number of HIV-positive pregnant women who received antiretroviral to reduce risk of mother-to-child-transmission	Number of HIV-positive pregnant women who received antiretroviral to reduce risk of mother-to-child-transmission
	E. Prognosis	
52	Offer a referral to a social worker or other support service if patient has difficulty obtaining food	Number of HIV patients who were offered a referral to a social worker or other support service if patient has difficulty obtaining food
53	Percent of HIV-hospital mortality	Number of HIV patients who died while hospitalized

CNS: Central Nervous System

Denominator	Eligible population/periodicity
Number of HIV patients with CD4 < 350 cell/ul	All HIV patients/ annually
Number of HIV patients receiving care	All HIV patients/ annually
Number of HIV patients with CD4 < 350 cell/ul on cotrimoxazole prophylaxis last year	annually
Number of HIV patients whose CD4 < 200 cell/ul	All HIV patients/ annually
Number of HIV patients with a CD4 count < 200 cell/ul	All HIV patients/ annually
Number of HIV patients who had CD4 < 350 cell/ul	All HIV patients/ annually
Number of HIV patients who are currently on ART	All HIV patients on ART/ annually
Number of HIV patients on ART	All HIV patients/ annually
Number of HIV patients who start ART	All HIV patients on ART/ annually
Number of HIV patients enrolled to HIV care	All HIV patients/ annually
Number of HIV patients whose ART was changed	All HIV patients/ annually
Number of HIV patients on ART enrolled in HIV care	All HIV patients/ annually
Number of HIV patients on ART with dysfunctional status	All HIV patients/ annually
Number of HIV patients on ART	All HIV patients on ART/ annually
Number of HIV patients currently in care	All HIV patients/ 6 m
Number of HIV patients with TB	All HIV patients/ 6 m
Number of HIV-positive patients in HIV care or treatment (pre-ART or ART)	All HIV patients/ 6 m
Number of patients prescribed at least three ARV agents	All HIV patients/ 6 m
Number of HIV patients receiving care	All HIV patients/ annually
Number of HIV-positive pregnant women attended	All pregnant women/ annually
Number of HIV patients seen last year	All HIV patients/ annually
Number of HIV patients attended last year who were hospitalized	All HIV patients/ annually

In both questionnaires, a Likert scale to establish the most relevant and the most useful indicators for assessing the clinical care was used. The Likert scale had the following response options: 0 = without opinion; 1 = not relevant/not useful; 2 = less relevant/less useful; 3 = relevant/useful; 4 = more relevant/more useful. The 53 quality indicators (Table 1) are related to the following five different clinical domains: laboratory examinations (n = 11); clinical signs and symptoms (n = 10); diagnosis/follow-up (n = 10); therapy (n = 20); and prognosis (n = 2).

Statistical analysis

A database on SPSS (Statistical Package for Social Sciences) was created with data collected from questionnaires. The median was used to obtain the most relevant and effective quality indicators for assessing HIV/AIDS clinical care. All indicators that had a median equal to four for both classes (clinical relevance and practice utility) and that were not classified as "not relevant" or "not useful" by a single expert, were taken as a consensus quality indicator for clinical care assessment.

Cronbach's alpha coefficients test was used to measure the consistency of indicators in each domain. In order to do it, the median score for each of the five domains was calculated based on the score of each indicator within each domain. Cronbach's alpha was categorized with the following rules that were proposed by George and Mallery[26]: > 0.9 excellent; > 0.8 good; > 0.7 acceptable; > 0.6 questionable; > 0.5 poor and < 0.5 unacceptable reliability. To assess the strength of the relationship between the results from the clinical relevance and practice utility inquiries of each quality indicator and for each indicator domain, Kendall´s tau B rank correlation coefficients were calculated.

Ethics

This study is part of a research project for the development and application of a model of indicators to assess the quality of clinical care provided to patients with HIV/AIDS, which was approved by the Ethics Committee of the Hospital Sao João, Porto. Oral informed consent was also obtained from the participants. The procedures followed in this study are in accordance with ethical principles published on Helsinki Declaration of 1975, revised in 2008, on human experimentation.[27]

RESULTS

The two questionnaires were administered to 11 of 13 physicians (Infectious disease specialists) who work in an Infectious Diseases Department at a central hospital in Porto; two of them were not present at the time of the questionnaire administration. Only nine physicians responded to the clinical relevance questionnaire and eleven to practice utility. The response rate for the clinical relevance questionnaire was 82% and for practice utility was 100%.

Clinical Relevance and Practice Utility

Although an assessment of the individual indicators was performed, the results presented here have already been grouped into domains. For clinical relevance, the indicators of the diagnosis domain were evaluated and a median was obtained [minimum and maximum value] of 3.70 [3.10 – 4.00], the clinical signs domain was 3.50 [2.00 - 3.93], the laboratory examination domain was 3.37 [2.39 - 3.95], the therapy domain was 3.25 [3.00 – 3.95] and prognostic domain was 3.14 [2.43 - 4.00] out of a maximum of 4 points. For practical utility, the results for the indicators were 3.64 [3.00 – 4.00], 3.47 [2.13 - 3.73], 3.25 [3.05 - 3.60], 3.21 [2.21 - 3.82] and 3.00 [2.71 – 3.57], respectively (Table 2).

Physicians considered the domain diagnosis to have the most relevant and useful indicators out of the five different clinical domains, followed by clinical signs and symptoms. The prognosis domain was considered to be the least relevant and useful (Table 2).

Table 2 - Summary of measures of quality indicators for HIV/AIDS clinical care and Internal domain consistency on clinical relevance and practice utility

Clinical Relevance	Number of indicators	Median	Minimum	Maximum	Cronbach's alpha test
Diagnosis	**10**	**3.70**	3.10	4.00	0.733
Clinical Signs	**10**	**3.50**	2.00	3.93	0.971
Laboratorial exams	**11**	**3.37**	2.39	3.76	-
Therapy	**20**	**3.25**	3.00	3.95	0.900
Prognosis	**2**	**3.14**	2.43	4.00	0.820
Practice Utility					
Diagnosis	**10**	**3.64**	3.00	4.00	0.934
Clinical signs	**10**	**3.47**	2.13	3.73	0.964
Therapy	**20**	**3.25**	3.05	3.60	0.583
Laboratorial exams	**11**	**3.21**	2.21	3.82	0.947
Prognosis	**2**	**3.00**	2.71	3.57	0.368

Table 3 - Correlation (Kendall's Tau_b rank correlation) between each domain for clinical relevance and practice utility

	Lab exam	Clinical signs	Diagnosis	Therapy	Prognosis
Clinical relevance					
Laboratorial exams	1				
Clinical signs	0.648*	1			
Diagnosis	0.530*	0.647*	1		
Therapy	0.486	0.692*	0.337	1	
Prognosis	0.343	0.667*	0.424	0.558*	1
Practice utility					
Laboratorial exams	1				
Clinical signs	0.647*	1			
Diagnosis	0.629*	0.324	1		
Therapy	0.388	0.277	0.359	1	
Prognosis	0.294	0.061	0.088	0.090	1

* Significant correlation at 0.05 level

Reliability of the responses to the questionnaires

For most of the domains, the internal consistency of indicators is acceptable and, in some domains, excellent. Actually, for clinical relevance, the results show that the clinical signs (p = 0.971) and therapy (p = 0.900) have excellent internal consistency, while prognosis has good consistency (p = 0.820) and diagnosis acceptable consistency (p = 0.733). For practice utility, the results show that diagnosis (p = 0.934), clinical signs (p = 0.964) and laboratory examinations (p = 0.947) have excellent internal consistency, therapy has poor consistency (p = 0.583), and the consistency is unacceptable only for prognosis (p = 0.368) (Table 3).

Inter domain correlations

The Kendall´s tau B rank correlation (Table3) shows that, for clinical relevance, there are significant correlations between the "clinical signs and symptoms" and other domains, such as diagnosis [0.647], therapy [0.692] and prognosis [0.667]. Additionally, correlations between "laboratorial examinations" and clinical signs [0.648], diagnosis [0.530] and therapy [0.486] were found. For practice utility, significant correlations only between the domain "Laboratorial examinations" and both clinical signs and symptoms [0.647] and diagnosis [0.629] were found; for all of the aforementioned correlations, the p-value was < 0.001.

From the initial list of 53 quality indicators, 21 were chosen; indicators with median score of 4 points (maximum agreement) in both questionnaires were selected as the most clinically relevant and useful for assessing the quality of HIV clinical care (Table 4). The final list included indicators for all domains, except for prognosis; no single prognosis indicator reached a median of 4 points.

DISCUSSION

The purpose of our study was to find the clinical relevance and practice utility of HIV/AIDS quality indicators for clinical care assessment according to HIV/AIDS experts who routinely produce the indicator data and use those measures to assess HIV/AIDS hospital care. This paper reports on an early step towards formalizing the development and validation of a set of HIV/AIDS hospital care quality indicators.

In the process of assessing the clinical relevance and practice utility of HIV/AIDS quality care indicators, we discovered that the majority of physicians agreed that diagnosis and clinical symptoms and signs indicators domain are the most important for assessing the quality of care of HIV/AIDS patients. According to the physicians, prognosis indicators are the least important. Prognosis relies on a variety of factors that are not limited to the clinical care setting. Nevertheless, prognosis is not an issue to be ignored in assessing the quality of care. Some studies have shown that a significant proportion of patients attending HIV clinics miss important components of care, even those that are recommended by national guidelines,[18] which worsens their prognosis.[28]

Considering the opinions of physicians on the correlation of indicators between the domains, it was found that indicators of clinical signs and symptoms are correlated to all other indicators in clinical relevance. The clinical signs and symptoms indicators are critical to evaluate the problems (diagnosis) and to all clinical care. On the other hand, considering practice utility, correlation of laboratory examinations with clinical signs and symptoms and diagnosis is according to the clinical care in practice. Physician requests laboratory exams, on the basis of the clinical signs and symptoms, to support diagnostic reasoning. Thus, even though the results show that laboratory exams are important for the quality of care, physicians heavily rely on

Table 4 - HIV/AIDS quality indicators considered most useful and relevant for the assessment of hospital care, according to the experts

	Indicators	Mean	Median
	A - Laboratorial examinations		
1	Patient with shortness of breath at rest, have an arterial blood gas sample drawn	3.54	4
2	Proportion of HIV patients with haemoglobin documented	3.45	4
3	Proportion of HIV patients with total lymphocyte count documented	3.72	4
4	Proportion of HIV patients with absolute neutrophil count documented	3.72	4
10	Proportion of HIV patients with chest X-ray (normal and abnormal) documented	3.45	4
	B - Clinical signs and symptoms		
17	Proportion of HIV patients with a CNS change	3.67	4
18	Proportion of HIV patients with complicated cough	3.56	4
20	Proportion of HIV patients with lungs examined	3.54	4
	C - Diagnosis and follow-up		
23	Hepatitis C screening	3.72	4
24	Tuberculosis screening	3.63	4
26	*P jiroveci* pneumonia prophylaxis	3.72	4
27	Non-detectable HIV viral load	3.90	4
29	Proportion of patients with continued care	3.54	4
30	HIV prevalence among pregnant women	3.64	4
	D - Therapy		
32	Proportion of HIV patients with ART use	3.90	4
37	Proportion of patients eligible for ARV who are currently on ARV	3.78	4
42	Proportion of patients with a previous ARV regimen change for whom the reason for change in the regime is documented	3.72	4
45	Proportion of patients on ART with at least 95% (good) reported adherence on the last visit	3.67	4
49	Appropriate antiretroviral therapy	3.78	4
50	Co-management of Tuberculosis and HIV Treatment	3.67	4
51	Number of HIV-positive pregnant women who received antiretroviral to reduce the risk of mother-to-child-transmission	3.89	4

their own abilities to detect, diagnose and treat diseases[29] and to determine the prognosis.[30]

The indicators selected by physicians in this study are mostly HIV specific indicators. They are endorsed by the HIV American[31] and European[22] guidelines and the Spain[23] HIV core clinical care indicators. The quality is defined as the fulfillment of the standards, but it is also important to have an overall picture of the health status of the patient. The generic indicator selected "Patient with shortness of breath at rest has an arterial blood gas sample drawn" is not endorsed by the HIV treatment guidelines, but it is also important to assess more general guidelines. Some of the indicators, such as viral load count did not reach the median 4, but are not less important. The selection of a set of indicators should be made not only based on the opinion of doctors (HIV experts) but also weighing each indicator within the care process.

These results raise some issues that should be addressed in a future study. First, selected indicators may not represent all possible indicators for assessing the clinical care of HIV patients. This is not due to the systematic review method of obtaining them, but mostly to the fact that doctors were only asked to assess their clinical relevance and practical utility and were not asked to assess their suitability. Second, to be validated and used nationwide or internationally, more infectious diseases specialists from other hospitals that provide care to patients with HIV must be consulted. Third, the list of indicators used to gather HIV/AIDS expert opinion could possibly be more HIV/AIDS specific; however, we thought that this approach was more appropriate for covering all areas of healthcare giving us a complete idea of what should be taken into account to assess clinical quality of care in the HIV/AIDS field. Fourth, it would be important to have the opinion of HIV/AIDS

patients and also the perspective of patients themselves on the quality of clinical care. Although this is a small study, it is a good starting point for the establishment of specific quality indicators for evaluating the clinical care of patients with HIV.

This instrument should serve as a diagnostic tool, allowing hospital stakeholders to identify if HIV/AIDS care is not properly delivered and needs improvement. One of the main challenges is the source of the data. To assess the quality of clinical care provided to HIV patients, in addition to requiring appropriate and validated indicators, it is also necessary to have a computer system that can store in useful form information and process data. Thus, another challenge is to determine whether the management of clinical information is properly structured for providing information to generate these indicators and, if not, to design a new system that captures the information and automatically generates the indicators.

CONCLUSION

In conclusion, to measure the quality of clinical care, we must have indicators for almost all domains of clinical care. From the initial set of 53 indicators, physicians identified a subset of 21 as the most relevant and useful for assessing HIV/AIDS clinical care.

ACKNOWLEDGMENTS

The authors wish to thank Maria do Carmo Cruz for reviewing the manuscript, all Center for Research in Health Technologies and Information Systems (CINTESIS) staff for their continuous support during the execution of this study and the health professionals of the Infectious Diseases Department of Hospital S. João in Porto.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patient's data publication.

AUTHORS' CONTRIBUTIONS

All authors meet each of the three authorship requirements as stated in the Uniform Requirements for Manuscripts Submitted to Biomedical Journals.

COMPETING INTERESTS

The authors declare that they have no competing interests.

FUNDING SOURCES

No subsidies or grants contributed to this work.

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