Research Article

Impact of Accreditation on the Information Management System in Primary Health Care Units in El-Behera Governorate, Egypt

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ABSTRACT

Background: Accreditation is one of increasingly employed method for promoting quality at the primary health care units (PHC). It is a self-assessment and external peer reviewed process used by healthcare organizations to assess their level of performance accurately in relation to the established standards and to implement ways to improve the healthcare system continuously.

Objectives: The aim of this study is to assess the impact of accreditation on compliance with information management system standards in El-Behera PHC units.

Methods: A cross-sectional study was carried out in primary health care facilities in El-Behera Governorate. The study population included PHC units participating in accreditation and PHC units not participating in accreditation selected via a two stage stratified random sampling technique. The data were collected using a checklist developed in concordance with the Egyptian accreditation standards for primary health care facilities 2005 for areas related to the information management system. Accreditation standards were scored on a scale of 0-3 (score 3 given for fully met, 2 for acceptable partially met, 1 for unacceptable partially met and 0 for not met). An average percentage score was calculated (standards average percentage score = total facility score/ Target score X 100).

Results: The overall average score percentage for standard is significantly ($p < 0.05$) higher in accredited units than non-accredited ones (64.5 ± 17.9 versus 39.3 ± 13.6 respectively). The lowest mean score percent in accredited PHC units was demonstrated in almost two standards namely accuracy of medical records and verification of implementation (57.8±9.9 and 55.6±12.5 respectively).

Conclusion: There was a significant impact of primary health units' accreditation on the health information management system. However, those accredited units still not reach the desired level in standards regarding accuracy of medical records and verification of implementation.

Keywords: *Accreditation Egyptian standards, Health information management, Primary health care*

INTRODUCTION

Accreditation is a self-assessment and external peer review process used by healthcare organizations to assess their level of performance accurately in relation to established standards and to implement ways to improve continuously the healthcare system.[1,2] Most of the accreditation definitions agreed upon some basic principles for a health services accreditation system. First, it is voluntary; second, standards are clearly defined; third, compliance is assessed by periodic external review by health professionals; and fourth, the outcome of the review denotes compliance. In addition, accreditation is awarded for a time-limited period, and the whole process is generally independent of the financing system.[3] Worldwide, accreditation has proven to have many benefits. Moreover, patients are the biggest beneficiary with high quality of care and patient safety. It raises community confidence in the services provided by the health care organization and affords the opportunity to the health care unit to benchmark with the best. Additionally, accreditation provides access to reliable and certified information on facilities, infrastructure and level of care.[4] The benefits of accreditation also include providing a framework to help create and implement systems and processes that improve operational effectiveness. It besides advances positive health outcomes, improves communication and collaboration internally and with external stakeholder

strengthening interdisciplinary team effectiveness demonstrating credibility and a commitment to quality and accountability. Moreover, it helps decreasing liability costs, identifying areas for additional funding for health care organizations and provides a platform for negotiating this funding. In addition, accreditation enhances the organizations' understanding of the continuum of care, improves the organization's reputation among end-users and enhances their awareness and perception of quality care, as well as their overall satisfaction level, and finally promoting capacity-building, professional development, and organizational learning [5]

In Egypt, health care leaders recognized that health care needs improvements and in the absence of some catalysts for change in the status quo, meaningful improvements would be difficult. Without a national program, although some individual hospitals might embrace change and an improvement process, it would be unlikely that this would occur on a nation-wide basis.[6]

Building on the work that was accomplished during the initial Partnership for Health Reform Project (PHR), during the period from 2003 to 2005, the Ministry of Health and Population (MOHP) established an institutional base for a national accreditation program responsible for implementing and overseeing the program.[1]

The MOHP, with assistance from PHR, developed a strategy for building a Quality Improvement (QI) program. The strategy identified four key objectives; the first purpose was to build an organizational structure for QI in the MOHP (this resulted in the establishment of the QI Directorate at the MOHP). The second was to build capacity for QI at the central and governorate levels. The third was to set and disseminate standards of care and clinical practice guidelines for basic services. The last purpose was to develop a systematic process for monitoring and improving the quality of care, which resulted in the first primary health care (PHC) accreditation program. [1]

Over the three-year period, PHR worked with the MOHP to achieve the objectives listed above. While building capacity for QI, an initial set of standards for PHC facilities was developed. Similarly, an accreditation survey tool was developed and automated a computerized software. A curriculum for training in the principles and practice of QI, including tools and techniques, was developed and implemented. Training was provided to members of the MOH and to selected representatives of primary health care (PHC) facilities. The PHC accreditation program was tested and implemented in five reform facilities in the governorate of Alexandria and then expanded to cover 350 PHC facilities by the year 2005.[1] One of the first tasks in the

design of the accreditation program was the development of the key dimensions of quality that should be assessed in the accreditation program. The criteria for selecting the dimensions are based on their relative importance in defining quality of services in the Egypt. Eight categories were selected as the most important to measure in the accreditation, including Patient Rights, Patient Care, Safety, Management of the facility, Management of Support Services, Management of Information System, Quality Improvement Program and Family Practice.[6]

The health information system is uniquely positioned to capture, store, process, and communicate timely information to decision makers for better coordination of healthcare at both the individual and population levels.[7]

The aim of this study is to assess the impact of accreditation on compliance with the Egyptian information management system standards in El-Behera primary health care facilities.

METHODS

Study Setting & Design: A cross-sectional descriptive study was carried out in primary health care facilities in El-Behera Governorate. This governorate is divided into 16 directorates with 375 facilities providing primary health care service, of which 186 are accredited and 189 are not accredited facilities.

Study Population: The study population includes facilities not participating, and others participating in the accreditation program

Sampling Method: A two stage stratified random sample was used, where three out of sixteen directorates were selected randomly in El-Behera Governorate named Kafer-eldwar, Abuhomos, and Damuhour. Then a list of all centers of both types in each directorate was obtained and an equal number of both types of facilities (accredited, and non-accredited) were randomly selected, using the simple random sampling technique. A total number of 30 primary health care units (10 units per directorate) were selected, of which 15 were accredited facilities and 15 were not accredited facilities.

Data Collection Methods and Tools: To determine the degree of concordance of the information management system to the Egyptian accreditation standards for primary health care facilities, the following steps were conducted:

i. Review of the Egyptian accreditation standards for primary health care facilities 2005. The full document were thoroughly reviewed and examined for areas related to the information management system. The Egyptian accreditation standards for primary health care facilities (2005) contain eight quality dimensions, with

differential score weights for each dimension as follows: patient rights (5.88%), patient care (29.4%), safety (17.6%), support services (11.8%), management of information (5.88%), quality improvement program (5.88%), family practice model (17.6%), and facility management (5.88%). Each dimension is composed of one or more standards, and each standard includes a number of sub-standards.

ii. To improve the researchers' survey skills and judgment, one of the researchers joined the Ministry of Health surveyor teams training to acquire the skills to evaluate adherence to the identified standards.

iii. The Egyptian Accreditation standards Checklist was used to assess the degree of compliance of facilities with the information management system standards.
The checklist was composed of two sections designated Section 1; that comprised data about the facility (name, directorate and state of accreditation), and Section 2, the information management system standards: that contains the information management system against which the primary care facilities were evaluated.

iv. Collection of data: facility tour started with interviewing managers of the selected primary care facilities with the objective of orienting them about the purpose of the study, and assuring him/her about the confidentiality of the information as well as making the necessary arrangements for conducting the study. This was followed by a review of the required documents. Document review included all policies and procedures available on medical records; minutes from the medical record committee meetings if available; and reports of the medical record committee reviews. All required documents were reviewed regarding its presence, legibility of contents, updating and the presence of unknown abbreviations. Patient records (daily log/printouts, encounter forms) were also reviewed. A sample of 10 patients who have had a medical encounter in the last 6 months was taken as required by Ministry of Health standards. Patient records were checked for accuracy, validity and consistency. Information reports were reviewed for content, frequency and use. Immunization reports were checked for accuracy and validity. Medical records were reviewed for completeness and accuracy. The Availability of the system for reviewing medical records was assessed. The appropriate and timely action taken to ensure the accuracy and completeness of patient files were also assessed.

v. Record review was complemented by staff interview to ask about some aspects, including type of existent audit mechanisms and how frequently data are verified…..etc. The findings were written in details, and then objective evidence of each finding was examined and evaluated.

Scoring System: Degree of concordance to the information management system standards was based on the scoring system of the Egyptian accreditation standards for primary health care. These standards were scored on a scale of 0-3 as follows: Fully Met: (3), Acceptable (partially met): (2), Unacceptable (partially met): (1), Not met: (0), Not Applicable: (-1) if the standard could not be applicable. The final outcome for accreditation of each dimension is: accredited (more than 79%), provisionally accredited (50-79%), and denied (less than 50%). Similarly, the final outcome for accreditation of each facility is: accredited (more than 79%), provisionally accredited (50-79%), and denied (less than 50%).

Statistical Analysis: After data collection, data entry and analysis were done by using the computer program, Statistical Package for Social Science (SPSS) version 16.0. Descriptive statistics using frequency distribution tables were carried out. For statistical analysis, each decision (fully met, acceptable partially met, unacceptable partially met, not met) was given a score (3, 2, 1, 0, respectively) and not applicable standards were coded (-1). An average percent score was calculated for each Standard using the following formulae:

− Standards average percentage score = (Total facility score/ Target score) ×100.

− Total facility score = (number of fully met standards × 3) + (number of acceptable partially met standards × 2) + (number of unacceptable partially met × 1).

− Target score = Number of fully met standards ×3

Data were tested for normality by using Kolmogrov and Smirnov test. T-test was used to compare the mean of average score percent. Mann-whitney test was used to assess the difference between accredited and non-accredited PHC units in scores of each sub-standards. The 5% level was used as a cut-off point value of statistical significance.

Ethical statement: the study was approved by the institutional review board and the ethics committee of the High Institute of Public Health. The study complied with the international research ethics of declaration of Helinsinki.

RESULTS

Table 1 shows the first standard of the health information system, which assesses data reporting system. The lowest mean score for accredited PHC units is 1.60 for the substandard E1.2 compared to 0.73 for non-accredited PHC units, and this difference is statistically significant (p< 0.05). The mean score for substandard E1.4 related to immunization is the same in both the accredited and non-accredited units except for presence of vaccination manual, which has significantly (P < 0.05) higher score in accredited units (1.67 versus 0.67). Table 2 shows second standard of the health

information system, which assesses completeness and accuracy of medical records. The lowest mean score for both accredited and non-accredited PHC units is zero for E2.8 (documentation of referral or hospitalization) also the mean score is low for E2.7 (documentation and justification of the treatment plan) for both types of facilities (1 versus 0). Overall, the mean score for all substandard is higher in accredited than non-accredited PHC units, but this difference is significant (P < 0.05) for substandard E2.3, E2.7 and E2,9 (Signed patient consent, treatment plan written and presence of copy of referral respectively).

Table 1: Comparison between accredited and non accredited primary health care units according to first information system standard (El-Behera, 2011)

Substandard	Primary health care units				Z	P
	Accredited n=15		Non accredited n=15			
E.1 Data reporting system	$\overline{x}\pm$SD (Median)		$\overline{x}\pm$SD (Median)			
	No.	%	No.	%		
E.1.1 Data are recorded accurately	**1.67 ± 0.72 (2)**		**1.47 ± 0.64 (1)**		1.1	0.281
Not met	1	6.7%	0	0.0%		
Unacceptable partially met	4	26.7%	9	60.0%		
Acceptable partially met	9	60.0%	5	33.3%		
Fully met	1	6.7%	1	6.7%		
E.1.2 There is a system for routinely verifying reported data	**1.60 ± 0.91 (2)**		**0.73 ± 0.80 (1)**		2.5	0.013*
Not met	2	13.3%	7	46.7%		
Unacceptable partially met	4	26.7%	5	33.3%		
Acceptable partially met	7	46.7%	3	20.0%		
Fully met	2	13.3%	0	0.0%		
E.1.3 Information system generates useful information reports on timely basis	**2.2 ± 0.86 (2)**		1.93 ± 0.03 (1)		0.7	0.493
Not met	0	0.0%	1	6.7%		
Unacceptable partially met	4	26.7%	5	33.3%		
Acceptable partially met	4	26.7%	3	20.0%		
Fully met	7	46.7%	6	40.0%		
E.1.4 The facility maintains accurate and valid immunization reports according to MOH policy						
- Immunization session registries (fully met)	3.0 ± 0		3.0 ± 0		-	-
	15	100%	15	100%		
- Immunization and birth registries (fully met)	3.0 ± 0		3.0 ± 0		-	-
	15	100%	15	100%		
- Defaulter registries (fully met)	3.0 ± 0		3.0 ± 0		-	-
	15	100%	15	100%		
- Refrigerator 's temperature register (fully met)	3.0 ± 0		3.0 ± 0		-	-
	15	100%	15	100%		
- Monthly immunization register (fully met)	3.0 ± 0		3.0 ± 0		-	-
	15	100%	15	100%		
- Vaccination manual	**1.67 ± 0.35(1)**		**0.67 ± 0.11 (0)**		2.2	0.027*
Not met	4	26.7%	10	66.7%		
Unacceptable partially met	4	26.7%	2	13.3%		
Acceptable partially met	0	0.0%	1	6.7%		
Fully met	7	46.7%	2	13.3%		

Z = Mann Whitney test,* P = significant (< 0.05), $\overline{x}$ = mean and SD= standard deviation

Table 3 shows third, fourth and fifth standard of the health information system, which assesses presence of a system for reviewing medical records, keeping records confidential and verification of implementation. The lowest mean score for accredited facilities is 1.4 for substandard E3.3 (committee review medical records routinely) compared to 1 in non-accredited facilities. Overall, the accredited PHC units are significantly (p < 0.05) higher the non-accredited ones in all represented substandard.

Table 2: Comparison between accredited and non-accredited primary health care units according to second information system standard (El Behera, 2011)

Substandard	Primary health care units		Z	*P*
	Accredited n=15	**Non accredited** n=15		
E.2 Completeness and accuracy of medical records	$\bar{x}\pm$SD (Median)	$\bar{x}\pm$SD (Median)		
	No. %	No. %		
E.2.1 The design of the records is adequate for recording data continuing patient care	**2.0 ± 0.53 (2)**	**1.67 ± 0.49 (2)**	0.4	0.673
Unacceptable partially met	6 40.0%	6 60.0%		
Acceptable partially met	7 46.7%	9 40.0%		
Fully met	2 13.3%	0 0.0%		
E.2.2 All entries in chart are signed and dated	**1.37 ± 0.59 (2)**	**1.27 ± 0.46 (2)**	1.7	0.093
Unacceptable partially met	2 13.3%	5 33.3%		
Acceptable partially met	11 73.3%	10 66.7%		
Fully met	2 13.3%	0 0.0%		
E.2.3 Signed patient consent form attached to chart, if applicable	**2.47 ± 0.52 (2)**	**2.33 ± 0.62 (1)**	2.2	0.026[*]
Unacceptable partially met	5 33.3%	11 73.3%		
Acceptable partially met	9 60.0%	4 26.7%		
Fully met	1 6.7%	0 0.0%		
E.2.4 Relevant history finding are recorded in the file	**1.93 ± 0.46 (2)**	**1.67 ± 0.49 (2)**	0.5	0.586
Unacceptable partially met	0 0.0%	1 6.7%		
Acceptable partially met	8 53.3%	8 53.3%		
Fully met	7 46.7%	6 40.0%		
E.2.5 Findings of physical exam are recorded in the file	**3.0 ± 0.46 (2)**	**2.93 ± 0.26 (2)**	1.5	0.139
Unacceptable partially met	2 13.3%	5 33.3%		
Acceptable partially met	12 80.0%	10 66.7%		
Fully met	1 6.7%	0 0.0%		
E.2.6 Diagnosis is recorded in the file			-	-
Acceptable partially met	3.0 ± 0	3.0 ± 0		
Fully met	15 100%	15 100%		
E.2.7 Treatment plans and changes in plans are recorded and justified in the file	**1.0 ± 0.00 (1)**	**0.0 ± 0.0 (0)**	2.9	0.004[*]
Not met	7 46.7%	14 93.3%		
Unacceptable partially met	1 6.7%	1 6.7%		
Acceptable partially met	7 46.7%	0 0.0%		
E.2.8 Any hospitalization or referral to specialist and changes is recorded and justified in the file	0.0 ± 0	0.0 ± 0	-	-
Not met	15 100%	15 100%		
E.2.9 Patient's chart contains copy of the referral slip (if applicable)	**1.73 ± 0.46 (2)**	**1.20 ± 0.41 (1)**	2.8	0.004*
Unacceptable partially met	4 26.7%	12 80.0%		
Acceptable partially met	11 73.3%	3 20.0%		

Z = Mann Whitney test,* P = significant (< 0.05), $\bar{x}$ = mean and SD= standard deviation

Table 3: Comparison between accredited and non-accredited primary health care units according to third, fourth and fifth information system standard (El Behera , 2011)

Substandard	Primary health care units		Z	*P*
	Accredited n=15	**Non accredited** n=15		
E.3 System for receiving medical records and keeping records confidential	$\bar{x}\pm$SD (Median)	$\bar{x}\pm$SD (Median)		
	No. %	No. %		
E.3.1 The facility has a medical records committee	**3.0 ± 0 (3)**	**2.13 ± 0.30 (3)**	2.4	0.016[*]
Not met	0 0%	3 20.0%		
Unacceptable partially met	0 0%	2 13.3%		
Fully met	15 100%	10 66.7%		

E.3.2 There is a job description and terms of reference for medical records committee	**1.73 ± 1.1 (2)**	**0.47 ± 0.83 (0)**	3.0	0.002*
Not met	3 20.0%	11 73.3%		
Unacceptable partially met	2 13.3%	1 6.7%		
Acceptable partially met	6 40.0%	3 20.0%		
Fully met	4 26.7%	0 0.0%		
E.3.3 The committee reviews medical records routinely (at least once every 2 months)	**1.4 ± 0.83 (2)**	**1.0 ± 0.85 (1)**	2.4	0.015*
Not met	3 20.0%	7 46.7%		
Unacceptable partially met	3 20.0%	6 40.0%		
Acceptable partially met	9 60.0%	2 13.3%		
E.4 System to ensure that patients records are confidential	**1.80 ± 0.86 (2)**	**0.27 ± 0.46 (1)**		
Not met	1 6.7%	4 26.7%		
Unacceptable partially met	4 26.7%	8 53.3%	3.8	0.000*
Acceptable partially met	7 46.6%	2 13.3%		
Fully met	3 20.0%	1 6.7%%		
E.5 Verification of implementation	**1.67 ± 0.98 (2)**	**0.27 ± 0.49 (0)**		
Not met	2 13.3%	11 73.3%		
Unacceptable partially met	4 26.7%	4 26.7%	3.8	0.000*
Acceptable partially met	6 40.0%	0 0%		
Fully met	3 20.0%	0 0%		

Z = Mann Whitney test,* P = significant (< 0.05), $\bar{x}$ = mean and SD= standard deviation

Table 4 illustrates comparison between accredited and non-accredited primary health care units according to average score percent of all information system standards. The overall average score percent for standard is significantly ($p < 0.05$) higher in accredited units than non-accredited ones (64.5 ± 17.9 versus 39.3 $\pm$ 13.6 respectively). The lowest mean score percent in accredited PHC units demonstrated in almost two standards namely, accuracy of medical records and verification of implementation were (57.8 ± 9.9 and 55.6 ± 12.5 respectively).

Table 4: Comparison between accredited and non accredited primary health care units according to average score percent of all information system standards (El Behera, 2011)

	Primary health care units		T -test	*P*
Standard	**Accredited n=15**	**Non accredited n=15**		
E.1 Data reporting system				
Minimum - Maximum	59.3 -96.3	59.3 - 92.6	2.6	
Mean ± SD	81.2 ± 11.2	71.1 ± 10.2		0.015*
E.2 Accurate medical records				
Minimum - Maximum	44.4 - 74.1	33.3 - 59.3	3.5	
Mean ± SD	57.8 ± 9.9	47.2 ± 6.5		0.002*
E.3 Medical records reviewing system				
Minimum - Maximum	33.3 - 88.9	0 - 77.8	3.8	
Mean ± SD	68.1 ± 19.6	36.3 ± 25.7		0.001*
E.4 Confidential patients records				
Minimum - Maximum	0 - 100	0 - 100	2.6	
Mean ± SD	60.0 ± 8.7	33.3 ± 8.2		0.016*
E.5 Verification of implementation				
Minimum - Maximum	0 - 100	0 - 33.3	5.0	
Mean ± SD	55.6 ± 12.5	8.9 ± 15.3		0.000 *
Overall				
Minimum - Maximum	35.5 – 90.3	20.7 – 64.4	4.3	0.000 *
Mean ± SD	64.5 ± 17.9	39.3 ± 13.6		

   * P = significant (< 0.05), SD= standard deviation

DISCUSSION

Accreditation was associated with improved delivery of health care and quality. Significant improvements were reported for several aspects of care such as documentation, which initially was a challenging area for most PHC centers.[8-10] The current study aimed to evaluate a program of implementing accreditation in primary health care units in Egypt compared with control units to evaluate the positive impact of accreditation on information systems in those centers. Clinical documentation in a patient's medical record includes any and all information that relates to the care given to the patient. It is designed to evaluate the current status of the patient, assist in developing a plan of care, evaluate the care given, and provide for continuity of care. It is critical that it be accurate and complete. Complete and timely health records also ensure that all clinical staff caring for patients in present and future episodes of hospitalization have access to the information they need to deliver optimum care.[11,12] For any PHC center to function optimally, it is expected that patient record retrieval and accuracy rates exceed 90 percent.[12] The results show that this was not achieved in the study centers. Although the accredited PHC centers had a higher score than non-accredited, an overall mean score of 64.5 indicates that systems requirements for an efficient, effective health record system were not in place. Several studies have noted the lack of accuracy in the documentation where it has been found that documentation is used more as a tool to recall events rather than as a means to justify treatment decisions, often leading to a lack of completeness, accuracy and timeliness in completing medical records.[13-16] Regarding the completeness and accuracy of medical records in our study which contain nine elements accreditation, only three elements showed to improve in the mean score namely signed patient consents, documentation of treatment plan and presence of a copy of referral slip. This may be explained by many factors such as the presence of high flow of patients and work overload so doctors only concerned about complete the documents which have medico-legal consequences. Also there may be lack of doctors' awareness about the benefits that they could gain from complete accurate records such as saving of their efforts and time in delivering health care. Also, benefits for their patients in the matter of less waiting time and good quality of care. Other studies attributed this inaccuracy of documentation to lack of physician education about how to document.[17,18] One of the issues related to poor documentation is the requirement for physicians to complete multiple documents with similar content.[18] Problem of poor documentation can be partially solved through establishment of good electronic health record, which gives an alert to the clinician in case of missing data or wrong results were entered. This will save efforts of doctor and ensure accuracy and completeness of data as found in several studies.[19-22] Our results regarding the sub-standard of immunization reports revealed that it takes the maximum score and there was no difference between accredited and non-accredited PHC units, the facility maintains accurate and valid immunization reports according to MOH policy. This may be explained by the facts that this service is considered as one of the basic services that the PHC units deliver to their attendants also immunization sector has good financial, logistical and training support from international organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) as part of their worldwide programs, as well as by the Ministry of Health. As a result, staff members involved in these programs are well trained, receive better incentives and are well established in their positions. These factors, in addition to the fact that the services are almost free, lead to higher use and eventually a more positive perception of the programs. This evidence was supported by results of other studies.[23-25] While a number of studies revealed that accreditation increased immunization rates.[26,27]

In the present study, the impact of the accreditation program explains the differences between the accredited and non-accredited facilities with regard to the third, fourth and fifth substandard score of information system standards, which assess reviewing medical records, keeping records confidential and assessment of verification of implementation, which is matched with results of other studies. [28-30]

Finally, the presence of a system for receiving, keeping and reviewing confidentiality of medical records through medical records committee and also presence of verification of implementation exist in the accredited facilities as a basic factor for accreditation. However, they are not enforced or properly implemented in spite of the presence of quality improvement committees that should meet on the monthly basis to discuss priorities for improvements.

CONCLUSION AND RECOMMENDATIONS

There was a significant impact of accreditation of primary health units on the health information management system. However, those accredited units still not reach the desired level in standards regarding accuracy of medical records and verification of implementation. We recommend accordingly that the health directorate in El Behera should give more attention to PHC accreditation program to be implemented in all PHC units. Compliance toward

accreditation requirements should be improved via implementation of training programs, especially regarding the importance and ways of documentation. Establishment of electronic medical records to facilitate the documentation of care in PHC to improve compliance to accreditation standards.

CONFLICT OF INTEREST

All authors declare no conflict of interest

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