Original Article

Standard Precaution Practices among Doctors and Nurses in the University College Hospital Ibadan

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Abstract

This study examined practice of standard precautions among health workers in the University College Hospital Ibadan. The research adopted a cross-sectional survey design using quantitative research methods.The study was conducted within the premises of the University College Hospital (UCH), Ibadan. In this study, the reference population included doctors and nurses in UCH, from which a representative sample size of 308 participants was obtained. Multistage sampling technique was used to select participants for the study. Data collection was conducted using a structured, pre-coded, self-administered questionnaire. Three hypotheses were formulated and tested using t-test and multiple regression analysis. Majority of the HCWs reported as they 'always' use gloves and gown during procedures that needs this protective equipment. But only 10.4% of them reported that they 'always' wore Mask and Goggle. Major reasons for low practice levels included incidents of inadequate supplies, carelessness, discomfort with use and discomfort among patients. Further results showed that there was no significant difference in practice of standard precautions between nurses and doctors [t(292)=-.352; p>.05]. There was also no significant difference in practice of standard precautions between respondents who reported more positive attitude towards standard precautions and their counterparts who reported less positive attitude towards standard precautions [t(292)=.084; p>.05]. Age (β=-.041; p>.05) and marital status (β=-.003; p>.05) emerged as insignificant predictors of standard precautions practice, work experience (β=.103; p<.05) emerged as a significant positive predictor of standard precautions practice among nurses and doctors in UCH. Suitable recommendations were provided in line with the study outcomes.

Keywords: Standard precaution practice, Doctor, Nurse, University College Hospital

Introduction

Health care workers (HCWs) such as medical doctors, nurses, laboratory staff and attendants who work in health care settings are frequently exposed to infectious diseases during their work. Infections acquired in the health care setting are major causes of anxiety for HCWs. These infections include diseases like hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency Virus (HIV) and other blood borne diseases (Hosoglu *et al*., 2011). Globally, it has been estimated that the annual proportions of HCWs exposed to blood-borne pathogens were 2.6% for HCV, 5.9% for HBV, and 0.5% for HIV (Cutter & Jordan 2012). In Nigeria, documented cases of HIV infection following occupational exposure among HCWs has continually increased to an annual average of 1000 cases since the first recorded case in 1984 (Okechukwu *et al*., 2012). The fact that patients' blood and other body fluids are potentially hazardous to HCWs, the safety of HCWs at their work place has become a great concern for health professionals all over the world (Izegbu, Amole & Ajayi, 2006).

Studies have shown that HCWs are at risk of being infected with blood borne pathogens due to their occupational exposure to blood and other body fluids (BBF) (Agaba *et al*., 2012; Omiepirisa, 2012; Okechukwu *et al*., 2012;; Prüss-Üstün *et al*., 2005). It has been estimated that HCWs' exposure to blood-borne pathogens contributes annually to about 16,000 HCV infections and 66,000 HBV infections among HCWs worldwide (Prüss-Üstün *et al*., 2005) and 90% of these infections occurred in low-income

countries (Kermode *et al*., 2005). In general, the most common route of exposure is through sharps; lancets, broken glass, needles and other sharps instruments, while exposures from needle stick injuries has been reported as the most common of all (Omiepirisa, 2012). However, it should be noted that many studies have demonstrated that the incidence of needle stick injuries are poorly reported globally and more so in developing countries (Honda *et al*., 2011; Bolarinwa *et al*., 2011; Chalya *et al*., 2015; Voide *et al*., 2012; Amira *et al*., 2014). The reasons for non-report of these incidents range from perceived low risk of infection transmission following exposure, to perceived lack of time (Bolarinwa *et al*., 2011; Chalya *et al*., 2015; Voide C *et al*., 2012; Amira *et al*., 2014).

The earliest attempt to reduce the incidence of hospital-acquired infections among Health care workers was in 1877, when the first recommendation for isolation precautions was published in the United States for patients with known infectious diseases (Lynch, 1949; CDC, 1996). Several recommendations, guidelines and protocols have since been published by the Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO) and the United States Occupational Safety and Health Administration (OSHA); most of which were about protection against specific diseases or during a particular procedure. Countries adopt recommendations and guidelines from these bodies to develop their country-specific policies and guidelines.

In 1983, the CDC published the Universal Blood and Body Fluid precautions, simply called the 'Universal Precautions' (CDC, 1985; Farlex, 2012). These precautions were meant for patients known to have or sSPected to have an infectious blood-borne pathogen and were also meant to prevent parenteral, mucous membrane and non-intact skin exposures to blood-borne pathogens by Health care workers (CDC, 1985). They apply to blood, semen, vaginal secretions, deep body fluids, body fluids with visible blood, but not to faeces, nasal secretions, sputum, sweat, urine, tears and vomitus; unless they contain visible blood (CDC, 1983). In 1991, OSHA published its Occupational Exposure to Blood-borne Pathogen Standards, where they incorporated the Universal Precautions and added requirements for employers of Health care workers to provide engineering controls, protective barriers and devices, immunization against hepatitis for Health care workers and training of Health care workers on the Universal Precautions (Farlex, 2012).

However, in 1996, the CDC published new guidelines known as the Standard Precautions sometimes, also referred to as the 'Safety Precautions' (SP) (Farlex, 2012). It includes the Universal Precautions as well as other recommendations for care of patients irrespective of their diagnosis or presumed infection status. The SP apply to blood, all body fluids, secretions and excretions except sweat, with or without the presence of visible blood (Garner, 1996; CDC, 2011). It includes: hand hygiene, use of personal protective equipment (e.g., gloves, facemasks), respiratory hygiene and cough etiquette, safe injection practices and safe handling of potentially contaminated equipment or surfaces in the patient environment (CDC, 2011), decontamination and disinfection of instruments, maintenance of sanitary workplace and safe waste disposal; which are the core principles of the SP (USAID, 2000). Under each of these principles are the recommended activities or 'dos' and 'don't' expected of Health care workers in order to achieve adherence to the principles. These recommended activities are the SP practices.

Currently the National Agency for the Control of AIDS (NACA) in collaboration with the Nigerian Federal Ministry of Health (FMOH) is saddled with the responsibility of developing, reviewing and disseminating guidelines and policies related to safety practices among Health care workers in health care settings in the country (NACA, 2010). Guidelines and policies are being periodically reviewed and disseminated while implementation at the State and Local Government levels are meant to be monitored by the State and Local Government arms of the FMOH and NACA (NACA, 2010; NACA, 2014). Some of the specific guidelines developed to ensure optimal practise of the SP in health care settings in Nigeria includes the following; National policy on universal safety precaution, Guidelines on TB infection control, TB infection control plan, Policy and Guidelines on safety of blood and blood products, Health care waste management protocol, National protocol of post exposure prophylaxis and Health workers' injection safety guidelines (NACA, 2010). However, no report or document was found

about the efforts of the FMOH and NACA to enforce the implementation of these guidelines and policies at all levels.

Statement of Problem: The practice of standard precautions is being widely promoted to protect Health care workers from occupational exposure to body fluids and consequent risk of infection with blood-borne pathogens. Health care workers are potentially exposed to blood-borne and other infections through contact with body fluids while performing their duties. Health care workers frequently provide care to patients whose HBV, HIV and hepatitis C virus (HCV) status is unknown, and individuals may be asymptomatic for months to years while being infectious. The occupational health of the health care workforce of about 35 million people globally, representing about 12% of the working population, has been neglected. About three million Health care workers worldwide receive percutaneous exposure to blood-borne pathogens each year. These injuries may result in 15,000 HCV, 70,000 HBV and 500 HIV infections, and more than 90% of these infections occur in developing countries. Worldwide, about 40% of HBV and HCV infections and 2.5% of HIV infections in Health care workers are attributable to occupational sharps exposures, which are mainly preventable (WHO, 2016)

The Occupational Safety and Health Administration estimates that 5.6 million Health care workers worldwide, who handle sharp devices, are at risk of occupational exposure to blood-borne pathogens. Needle stick injuries were shown to be the commonest (75.6%) mechanism for occupational exposure in a Nigerian teaching hospital. These injuries are usually under-reported for so many reasons, which include stigma that could be associated with an eventual infection with HIV in the affected HCW. There is no immunization for HIV and HCV, thus the most effective prevention is through regular practice of the standard precautions.

Compliance to standard precautions is low in public secondary health facilities, especially in resource-limited settings, thus exposing Health care workers to the risk of infection. Occupational safety of Health care workers is often neglected in low-income countries in spite of the greater risk of infection due to higher disease prevalence, low level awareness of the risks associated with occupational exposure to blood, inadequate supply of personal protective equipment (PPE), and limited organizational support for safe practices. Blood and other body fluids from patients are becoming increasingly hazardous to those who provide care for them. There is therefore a need for adequate measures to ensure compliance to standard precautions and reduce the risk of infection among Health care workers.

Research Hypotheses

In line with the study objectives, the following research hypotheses are formulated for testing.

Hi: There will be significant difference in practice of standard precautions across health care workers in the university college hospital Ibadan.

Hi: Attitude towards standard precautions will have a significant influence on practice of standard precautions among health care workers in the university college hospital Ibadan

Hi: Age, years of experience and marital status will have significant joint and independent influence on practice of standard precautions among health care workers in the university college hospital Ibadan

Research Methods

Design and Settings: The research adopted a cross-sectional survey design using quantitative research methods to examine practice of standard precautions among health workers in the University College Hospital Ibadan. The study was conducted within the premises of the University College Hospital (UCH), Ibadan. The University College Hospital (UCH) is strategically located in Ibadan North LGA. The physical development of the Hospital commenced in 1953 in its present site and was formally commissioned after completion on 20 November 1957. The Hospital, at inception in 1957, prior to the Act of Parliament, had two clinical Departments (Medicine and Surgery). However, the Hospital has evolved to accommodate about 65 Departments. The Hospital, though a tertiary healthcare facility, still caters for a lot of the primary and secondary healthcare burden. The patients turn out in the Emergency Department of the Hospital averages 6500 annually and about 150,000 new patients

are seen in the various out-patient clinics every year.

Population and Study Sample: In this study, the reference population included doctors and nurses in University College Hospital (UCH), Ibadan. A representative sample size of 308 participants was obtained based on an estimated total number of nurses and doctors in the University College Hospital (UCH), Ibadan. The hospital has a staff strength of over 3000 which comprise at least 600 doctors and 1000 nurses (Iyun, 2016). The sample size was obtained using Slovin sample size determination formula;

$n = N / (1+Ne^2)$

where; n=sample size

N=population size

e=error margin

$n = 1600/(1 + 1600*.05^2)$

$= 1600/5.2$

$=307.7$

= 308 healthcare workers (doctors and nurses)

Sampling Technique: A multistage sampling technique was used to select participants for the study. In the first stage, a stratified random sampling was adopted. This involved creating limited strata made up of a minimum of 10 units/departments each within the UCH. In the second stage simple random sampling via the ballot technique was used to select 5 participating units/departments from each stratum. The third stage involved the use of purposive sampling in which nurses and doctors from each of the participating units/departments were selected. Factors considered included eligibility and willingness to participate in the study

Instrumentation: Data collection was conducted using a structured, pre-coded, self-administered questionnaire. Questionnaires are documents containing questions and other items designed to elicit information appropriate to specific research and analysis. The questionnaire is made up of four main sections, namely, biographical data (section A), attitude towards standard precautions (section B), practice of standard precautions (section C), and factors influencing compliance of standard precautions (section D). The answer categories were mutually exclusive and special instructions were provided where necessary for easy understanding. A covering letter also accompanied the questionnaire, which introduced the study and its purpose to participants and requested them to participate. It also provided instructions on how to complete the questionnaire. Participants were not requested to write their name or any other form of identity in the questionnaire in order to ensure that their identity could not be linked with their individual responses.

In order to measure the extent to which the survey instruments have been able to achieve their aims, the process of content validity will be employed by cross examination and verification. The knowledge gained from other investigations, literature review, theoretical framework and research methods was used for an initial face validation while expert assessment from the project supervisor provided content validatation for the instrument. Consequently, a number of items in the questionnaire were subject to amendment. A pilot study was carried out among a sample with similar charateristics to the study population. Outcomes form the pilot study were subjected to a split half reliability test in order to obtain the reliability coefficient for the instrument. Reliability coefficiants obtained were greater than .70 and deemed adequate for the study.

Data Collection Method: The researcher, accompanied by research assistants, visited participating units/departments within the University College Hospital in Ibadan. Upon completion of the administrative protocol, the purpose of the study was explained to the management of the units/department. In order to ensure effective administration of the instrument, a contact person (nurse/doctor) within each unit/department was implored to distribute copies of the questionnaire to all available colleagues within the unit/department.

The contact persons were encouraged to ask clarification questions. Printed instructions on how to complete the instrument was provided on each questionnaire, in which participants were assured that there are no right or wrong answers and a strict measure of confidentiality would be ensured.

Participants were expected to fill the questionnaires at their leisure time and return the completed questionnaires to the contact person at their earliest possible convenience. Data obtained

from the study were input and coded into an SPSS package for data analysis. Both descriptive and inferential statistics were employed in the data analysis. These included the use of percentage frequency, t-test and multiple regression analysis.

Results

Data was analysed using both descriptive and inferential statistics. Percentage frequency distribution tables, t-test and multiple regression analysis were adopted as analytical techniques. Results are presented in the following sections.

Table 1: Distribution of Respondents' Socio-Demographic Characteristics

		Frequency	Percent
Age	20-30years	10	3.4
	31-40years	101	34.2
	41-50years	117	39.7
	51-60years	67	22.7
Gender	Male	107	37.3
	Female	188	62.7
Marital Status	Single	107	36.3
	Married	136	46.1
	Divorced	34	11.5
	Widowed	18	6.1
Work Experience	1-5years	52	17.6
	6-10years	85	28.8
	11-15years	102	34.6
	16years or more	56	19.0
Designation	Nurse	179	60.7
	Doctor	116	39.3
	Total	**295**	**100.0**

Results from Table 1 show that majority (74.9%) of the respondents were between ages 31-50 years. The mean age of the respondents was 37.6 years with a standard deviation of 11.2. Their gender distribution showed that 62.7% of the respondents were female while the remaining 37.3% were male. The disparity in gender distribution can be alluded to the fact that nursing is a female dominated profession. Further results show that 36.3% of the respondents were single while 46.1% of them were married. the remaining were either divorced (11.5%) or widowed (6.1%). In terms of their work experience, 17.6% of the respondents had work experience ranging from 1-5 years, 28.8% of the respondents had work experience ranging from 6-10 years, 34.6% of the respondents had work experience ranging from 11-15 years, while 19.0% of the respondents had work experience of 16 years or more.

From 295 HCWs only 61.5% always practice hand washing after any direct contact with patient, 34.4% often practice standard precautions and the remaining 24.1% seldom practice standard precautions. As shown in Table 4.2, majority of the HCWs reported as they 'always' use gloves and gown during procedures that needs this protective equipment. But only 10.4% of them reported that they 'always' wore Mask and Goggle.

This study further assessed the major reason for poor practice and most of 84.4% of the respondents said that water and soap were not available at patient care areas. As shown in Table 3, the major reasons for poor practice of personal protective equipment like glove, gown and goggle, was shortage of supply. Furthermore, 60.2% of the HCWs

reported that they exposed to splash of blood or body fluid on their mucus membrane (i.e. eye, nose or mouth) in the last one year. After giving injection or drawing blood from patients 82.4% of the HCWs reported not recapping used needles, 17.0% of them had recapping and 0.6% of them practiced bending needles by hand. Regarding to exposure to sharp or needle stick injury 22.2 % of the HCWs exposed in the last one-year. Carelessness was the major reason stated by HCWs for recapping needles (54.1%) Discarding used needles and other sharps in a safety box was practiced among 79.5% of HCWs.

Hypotheses Testing: In line with the objectives of the study, four hypotheses were formulated and tested using appropriate statistical techniques. Results are presented in the following sections

Hypothesis One: There will be significant difference in practice of standard precautions across health care workers in the university college hospital Ibadan. This hypothesis was tested using t-test for independent measures. Results are presented in Table 4.

Results from Table 4.4 show that there was no significant difference in practice of standard precautions between nurses and doctors [t(292)=-.352; p>.05]. The results imply that both nurses and doctors in UCH exhibit similar practice levels of standard precautions. The hypothesis stated is therefore rejected.

Hypothesis Two: Attitude towards standard precautions will have a significant influence on practice of standard precautions among health care workers in the university college hospital Ibadan. This hypothesis was tested using t-test for independent measures. Results are presented in Table 5.

Results from Table 5 show that there was no significant difference in practice of standard precautions between respondents who reported more positive attitude towards standard precautions and their counterparts who reported less positive attitude towards standard precautions [t(292)=.084; p>.05]. The results imply that attitude towards standard precaution had no significant influence on practice levels of standard precaution among nurses and doctors in UCH. The hypothesis stated is therefore rejected.

Hypothesis Three: Age, years of experience and marital status will have significant joint and independent influence on practice of standard precautions among health care workers in the university college hospital Ibadan. This hypothesis was tested using multiple regression analysis. Results are presented in Table 6

Table 2: Standard Precaution Practice

Standard Precaution Practice	**Type of Personal Protective Equipment N=295**		
	Glove	Gown/Plastic Apron	Mask and Goggle
Always	86.7	89.9	10.3
Often	11.6	6.8	20.9
Seldom	1.7	3.1	48.9
Never	0	0.1	19.9

Table 3: Reasons for Poor Practice Level

Reasons for Poor Practice Level	Type of Personal Protective Equipment N=295		
	Glove	Gown/Plastic Apron	Mask/Goggle
Shortage of Supply	15.6	71.4	84.5
Carelessness	15.6	0	2.3
Discomfort with Use	39.1	24.5	11.6
Discomfort among Patients	29.7	6.1	1.6

Table 4: Summary of t-test showing difference in standard precaution practices between Nurses and Doctors in UCH

	Designation	N	Mean	Std. Deviation	df	t	sig
Standard Precaution Practice	Nurse	179	90.1732	9.79269	292	-.352	.725
	Doctor	115	90.6000	10.68513			

Table 5: Summary of t-test showing influence of attitude towards standard precaution on practice of standard precaution among nurses and doctors in UCH

	Standard Precaution Attitude	N	Mean	Std. Dev.	df	t	Sig
Standard Precaution Practice	More positive	158	90.3861	8.74969	292	.084	.933
	Less positive	136	90.2868	11.57194			

Table 6: Summary of multiple regression showing influence of demographics on practice of standard precaution among nurses and doctors in UCH

	R^2	F	Sig	Beta	t	Sig.
Age				-.041	-.694	.488
Marital Status	.009	.165	.920	-.003	-.050	.960
Work Experience				.103	.142	.047

Results from Table 6 show that age, work experience and marital status did not have significant joint influence on practice levels of standard precautions among nurses and doctors in UCH [F(3, 290)=.165; p>.05]. However, while age (β=-.041; p>.05) and marital status (β=-.003; p>.05) emerged as insignificant predictors of standard precautions practice, work experience (β=.103; p<.05) emerged as a significant positive predictor of standard precautions practice among nurses and doctors in UCH. The hypothesis stated is therefore partially accepted due to the significant influence of work experience on standard precautions practice.

Discussion

The first hypothesis which stated that there will be significant difference in practice of standard precautions across health care workers in the university college hospital Ibadan was not supported. The results imply that both nurses and doctors in UCH exhibited similar high practice levels of standard precautions. The results may be justified by the fact that training on standard precautions is paramount for the profession of nurses and doctors. Therefore, from a professional point of view, every nurse or doctor is expected to exhibit high practice levels of standard precautions. Another reason for the seemingly high levels of standard precaution practice among the respondents may also have emanated from the effect of social desirability responses from the study participants.

Supporting these findings, Arinze-Onyia, Ndu, Aguwa, Modebe and Nwamoh (2018) assessed the knowledge and practices of SP among HCWs at the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State and found that those who were trained on SP (70.8%) and PPE (69.7) were significantly more likely to use PPEs. A related study by Sadoh, Fawole, Sadoh, Oladimeji & Sotiloye (2006) practice levels of standard precautions was not comprised by majority of the nurses and doctors. Luo *et al*. (2010) investigated significant compliance with SPs by nurses and found that less than 5% of the 1,444 nurses did not comply with SP. Similarly, Maharaj *et al*. (2012) that less than 7% of doctors perceived themselves as non-compliant to the practice of SPs. However, in contrast to the result obtained in this study, Kolude, Omokhodion & Owoaje (2004) found that practice of standard precaution was highest among surgical and medical residents than nurses.

The second hypothesis which stated that attitude towards standard precautions will have a significant influence on practice of standard precautions among health care workers in the university college hospital Ibadan was not supported. The results imply that attitude towards standard precaution had no significant influence on practice levels of standard precaution among nurses and doctors in UCH. This outcome underscores theoretical tenets that attitude does not always predict practice. In the case of this study, the practice of standard precautions among majority of the respondents is more of a professional ethic than a personal disposition. Therefore, even though the respondents could be grouped as having more or less favorable disposition towards standard precaution, their obligation to practice these standard precautions was unwavering.

This outcome is similar to results obtained by Odusanya (2003) who conducted a study on attitude and compliance with universal precautions amongst health workers at an emergency medical service in Lagos, Nigeria, and found that their attitude towards universal compliance did not translate into safe work practices. A similar study by Bamigboye and Adesanya (2006) it was observed that doctor felt that the use of safety precautions in the medical practice could not be compromised in an era of communicable diseases, irrespective of the personal dispositions.

In another study Alam (2002) examined knowledge, attitude and practices among

health care workers (nurses and paramedical staff) and found a high practice level of standard safety precautions among them. Efstathiou *et al*. (2011) explored how hospital nurses' shared experiences affected by behaviour on compliance with the practice of SPs (100%) using a focus group.

They found that fear of contracting diseases was a more driving force towards compliance than attitude towards safety. On the other hand, Jawaid *et al*. (2009) found that 34% of the doctors in their study often judged the severity as a basis for strict adherence to safety precautions; which is indicative of a significant influence of attitude on practice levels.

The third hypothesis which stated that age, years of experience and marital status will have significant joint and independent influence on practice of standard precautions among health care workers in the university college hospital Ibadan was partially accepted due to the significant influence of work experience on standard precautions practice. In justifying the results obtained, it may be emphasized that medical health workers who have more years of experience on the job are more likely to have garnered an accumulation of first-hand experiences or cases that reinforce the need to adhere strictly to all standard precautions. Moreover, having more years of experience on the job presents health care workers with more opportunities for additional on-the-job training on standard precautions and safety measures in medical practice.

Corroborating results obtained in this study, another study done in Ethiopia showed that, nurses with less experience were at a higher risk of exposure to infectious diseases and had weak universal precautions practice (Reda, Vandeweerd, Syre & Egata, 2009). Similarly, Luo et al., (2010) found that longer duration of professional experience has been shown to be associated with improved compliance with standard precautions among health workers. Abdulraheem et al. (2012) also found that healthcare workers with ten years and above working experience had a high level of awareness of universal precautions than those with below five years. Furthermore, Abubakar et al. (2014), in their study of nurses in Gombe state revealed that years of experience has influence on practice of standard precaution.

Recommendations: Based on the outcomes of this study, health organisations must educate their staff to increase the level of awareness toward standard precautions, and increase the quality of patient care. Moreover, if the awareness of HCWs is improved, it will hopefully reduce the existing negative attitude toward the implementation of standard precautions, as the level of knowledge and compliance to standard precautions are reciprocally related. Looking to the future, organisations need to involve employees in the establishment of policies, and consider having a mandatory program for HCWs with time allowed to accomplish it effectively. Increasing HCWs' awareness and acknowledgment of risk factors in their work place, and the impact of their poor practice on both themselves and on patients is significant, and especially if they do not follow the guidelines. This change can be achieved through communication, which is another important aspect that impacts HCWs' compliance.

Thus, having regular meetings with all HCWs would reduce related practical issues, and highlight positive perceptions that would eventually increase and motivate HCWs to follow the guidelines. Involving staff in the policy process is also recommended, as employee engagement is beneficial in motivating staff to follow the guidelines. However all of those factors depend mainly on the organisation, as organisations have to provide the protective tools for their employees, and make sure the tools are suitable, effective and fit for purpose, furthermore they must be comfortable and easy to use. Therefore, the responsibility

rests not only on HCWs as employees, but also on managers and leaders; part of their duty is to keep updating and evaluating the HCWs' knowledge of standard precautions. Hopefully, after applying these recommendations, the HCWs' compliance and knowledge levels will be raised. This will result in improved quality of patient care.

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