



Knowledge and Attitude of Nigerian Health Workers Concerning Kangaroo Mother Care

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Authors' contributions

This work was carried out in collaboration between both authors. Author BANO designed the study, performed the statistical analysis, wrote the protocol and first draft of the manuscript. Authors UCO and BANO managed the analyses of the study. Author BANO managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Kangaroo mother care (KMC) is a low-cost intervention in the care of neonates with numerous advantages that reduce mortality. Knowledge and attitude of health workers towards KMC influences practice.

Objectives: To determine the knowledge of Nigerian health workers and their attitudes towards the practice of KMC

Methods: A cross-sectional study of 157 health workers at a scientific conference. Questionnaires were used to collect information on personal and health facility information, aspects on knowledge and attitudes towards KMC. Data was analyzed using EPI INFO version 7.

Results: There were 157 respondents from different health facilities from all over the Country. The number of respondents with a good level of knowledge [142(90.4%)] surpassed those with a good level of attitude [136(86.6%)]. The level of knowledge of KMC was significantly higher among

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doctors ($p=0.017$), paediatricians ($p=0.033$) and respondents that worked in facilities that care for sick neonates ($p=0.024$). The attitude level towards KMC was significantly higher among respondents that worked in facilities that care for sick neonates ($p=0.047$) and those that worked in facilities with functional incubators ($p=0.040$).

Conclusion: There was generally good knowledge and attitudes towards KMC. There is a need for further research on the reasons for knowledge-attitude gap regarding KMC.

Keywords: Kangaroo mother care; knowledge; attitude; health workers; Nigeria.

1. INTRODUCTION

Over 2.7 million newborns die each year, accounting for 44% of children dying before the age of five years worldwide [1]. With the newborn mortality rate of 29 deaths per 1,000 births, the global estimates rank Nigeria as the 11th highest on newborn deaths [2]. Complications of preterm birth are the leading cause of death among newborns [1]. In Nigeria, the leading causes are also preterm births and intrapartum related events [1] and 15% of babies are born as low birth weight babies [3]. Most preterm babies are low birth weight (LBW) and birth weight is a significant determinant of newborn survival. LBW infants are more likely to die, compared to normal weight babies. One-third of LBW babies die within the first 12 hours after delivery. LBW infants, have limited capacity for thermoregulation and are prone to decreased core temperature. Hypothermia causes tissue hypoxia, neurologic damage, hypoglycemia, metabolic acidosis, increased risk of sepsis and mortality [4].

Incubators, which are necessary for the thermal care of such babies, are not readily available in most developing countries such as Nigeria. Even when they are available, the health care staff and hospital management are faced with challenges such as inadequate number to meet demands, lack of constant power supply, poor maintenance and unavailability of parts, to mention a few. On the other hand, in developed countries where incubator care is readily available, various disadvantages exist when incubators alone are used for the thermal care of newborns. These include a reduction in breastfeeding and reduced maternal-newborn bonding. These at risk newborns therefore need an additional method of thermal care besides incubators alone. KMC is said to have originated in Colombia in 1978, [5] when healthcare situations were similar to what obtains in developing countries like Nigeria today. Dr. Edgar Rey Sanabria, Professor of Neonatology at Department of Paediatrics - Universidad Nacional de Colombia, introduced it to alleviate the shortage of caregivers and lack of

resources, keep LBW babies warm and to give exclusive breastfeeding as needed. This freed up overcrowded incubator space and care givers.

Kangaroo Mother Care (KMC) is the early, prolonged, and continuous skin-to skin contact between the mother (or substitute) and her low birth weight infant, both in hospital and after early discharge, until at least the 40th week of postnatal gestation age, with ideally exclusive breastfeeding and proper follow-up [6]. The mother's stable body temperature helps to regulate the neonate's temperature. The clinical efficacy and health benefits of kangaroo mother care have been demonstrated in multiple settings. In LBW newborns who are clinically stable, KMC reduces mortality and if widely applied could reduce deaths in preterm newborns [7,8]. The World Health Organization (WHO) has recommended KMC as a universal model of care in all types of settings, because the evidence shows that it benefits infants and families [9]. KMC has been found to have physiological, behavioural, psychosocial and cognitive developmental benefits, and it enhances mother-infant bonding [10-12]. In addition, it promotes breastfeeding, enables the mother to become more confident when caring for her infant, and results in early hospital discharge [11-13].

Even if health care providers (HCPs) are aware of research literature, their own personal knowledge and beliefs, including those on KMC, influence their encouragement or discouragement for KMC [14]. Information can only be given to mothers when there is adequate knowledge and practical experience of the practice. Since both positive and negative staff attitudes have been found to affect parents' application of KMC, the method is an example of a clinical practice based on attitudes rather than scientific evidence alone [15]. It has also been documented that the attitudes of neonatal nurses are considered to be the most important factor in determining whether or not parents perceive KMC to be a positive experience [16]. We, therefore, set out to determine the knowledge of

Nigerian health workers and their attitudes towards the practice of Kangaroo Mother Care.

2. METHODS

This was part of a cross-sectional study of the implementation of KMC [17] among health workers who attended the 45th annual scientific conference of the Paediatric Association of Nigeria held in Calabar, Nigeria in January 2014. Factors that determine implementation could be either physical or behavioural. This nested study was to determine the behavioural aspect of health care workers (Knowledge and attitude) that could determine their implementation of KMC in healthcare institutions [17]. The annual scientific meeting of the Pediatric Association of Nigeria is a forum that is usually attended by health workers who are involved or have interest in the care of children. Attendees are usually made up of doctors and nurses at different levels of their profession practicing in and outside Nigeria. The forum is a place for rubbing of minds, sharing of experiences and solutions to problems confronting both child health specialists and the Nigerian Child.

A pilot study was carried out in the authors' centre prior to the conference among nurses and doctors of various cadres to pre-test the questionnaire. This was done to ensure clarity of instructions across cadres and that items were understandable and worded appropriately. Ethical clearance was obtained from the local organizing committee of the conference. A convenience sampling method was used. consent was obtained from the attendees and questionnaires were given to those that gave consent. The filled out questionnaires were continually retrieved throughout the duration of the conference. Information collected from respondents included health facility information (name, location, type of practice, level of care rendered, availability of neonatal care, transport incubators and adequacy of incubators, and routine practice of KMC) and Health worker information (age, gender, occupation, level of qualification, area of specialty, years of practice, personal practice experience in educating parents or actual practice). Questions to assess the knowledge and attitudes of the health workers regarding KMC were asked in the questionnaire. The questions and statements were obtained from various literatures and studies [9,11,13,14] on KMC. A 3-point Likert scale (ranging from "disagree" to "agree") was used to assess their knowledge of, and attitudes towards, KMC. There were 10 knowledge and 7

attitude questions. Scores of 1, 2 and 3 were given for disagree, not sure and agree respectively or in the reverse order, depending on the correctness of the statement. The maximum obtainable marks therefore were 30 for the 10 knowledge questions and 21 for the 7 attitude questions. Respondents scoring less than 50% in any of the two areas of knowledge or attitude were considered to have poor knowledge or attitude, those scoring 50 – 75% moderate, and those scoring above 75% as having good knowledge or attitude towards KMC respectively.

Data collected was entered and analyzed using EPI INFO version 7. Chi- squared test and Fishers Exact test were used to test for significant associations between proportions. Comparison of means was done with the student's t test. A p value of 0.05 or less was considered statistically significant. Multivariable logistic regression was done to determine factors associated with poor knowledge of KMC.

3. RESULTS

Of the 157 respondents recruited in the study, all were health workers practicing in a Nigerian health institution. Sixty two (39.5%) were males and 95 (60.5%) were females. There were 122 (77.7%) doctors and 35 (22.3%) nurses. A total of 138 (87.9%) respondents worked in tertiary institutions and majority of the respondents 97.3% had been practicing as health care providers for more than 5 years (Table 1).

A total of 154 (98.1%) worked in facilities that care for sick neonates and the facilities of 84 (53.5%) of the respondents practiced Kangaroo Mother Care (KMC). Incubators were available in the facilities of 85 (54.1%) of the respondents and transport incubators in 53 (33.8%).

Responses of the respondents relating to knowledge of KMC and attitudes towards KMC are shown in Table 2. A higher percentage of the respondents were more knowledgeable about the benefits of KMC such as promotion of bonding and breast feeding compared to which infants require KMC and who can practice KMC.

Table 3 shows the level of knowledge of, and attitude towards KMC according to scores of respondents. The number of respondents with a good level of knowledge (142 (90.4%)) surpassed those with a good level of attitude (136 (86.6%)).

Table 1. Qualification, care level and years of practice of respondents [17]

	Frequency (N)	Percent (%)
Qualification		
Consultant	59	37.6
Senior registrar	36	22.9
Registrar	24	15.3
Medical officer	3	1.9
Nurse	35	22.3
Care level of health facility		
Primary	1	0.6
Secondary	18	11.5
Tertiary	138	87.9
Years of practice		
<5	9	5.7
5-10	46	29.3
11-15	46	29.3
16 – 20	17	10.8
>20	39	24.9

Shapiro- Wilk for all variables < 0.05

Table 2. Knowledge and attitude of respondents to KMC

Responses related to knowledge	Correct No. (%)	Incorrect No. (%)
I consider I have enough theoretical knowledge of KMC	129 (82.2)	28 (17.8)
I consider I have enough practical knowledge of KMC	108 (68.8)	49 (31.2)
KMC promotes bonding	153 (97.4)	4 (2.6)
KMC promotes effective and exclusive breastfeeding	147 (93.6)	10 (6.4)
KMC has a positive effect on the physical wellbeing of the infant	151 (96.2)	6 (3.8)
KMC has a positive effect on the general wellbeing of the infant	151 (96.2)	6 (3.8)
KMC enhances parental confidence and satisfaction	151 (96.2)	6 (3.8)
KMC should be avoided in intubated infants	39 (24.8)	118 (75.2)
KMC can be practiced for preterm and full term infants	134 (85.4)	23 (14.6)
Both parents can practice KMC	131 (83.4)	26 (16.6)
Responses related to attitude	Positive attitude No. (%)	Negative attitude No. (%)
All parents should be encouraged to practice KMC	115 (73.2)	42 (26.8)
Facilitating KMC is professionally satisfying	143 (91.1)	14 (8.9)
I think KMC increases workload of staff	128 (81.5)	29 (18.5)
KMC is easy to teach parents	151 (96.2)	6 (3.8)
I think the benefits of KMC makes it worth practicing	154 (98.1)	3 (1.9)
I would recommend the practice of KMC in all hospitals	139 (88.5)	18 (11.5)
I would recommend the continued practice of KMC after discharge	146 (93.0)	11 (7.0)

Table 3. Level of knowledge and attitude towards KMC according to scores of respondents

	Good (Score >75%) N (%)	Moderate (Score 50 – 75%) N (%)	Poor (Score <50%) N (%)
Knowledge score level	142 (90.4)	13 (8.3)	2 (1.3)
Attitude score level	136 (86.6)	19 (12.1)	2 (1.3)

As shown in Table 4, the level of knowledge of KMC was significantly higher among doctors (p = 0.017), paediatricians (p = 0.033), respondents that worked in facilities that care for sick

neonates (p = 0.024) and those that worked in facilities that practice KMC (p = 0.027). The level of knowledge of KMC was also higher among females, neonatologists, respondents that

worked in facilities in the southern part of the country and those that worked in facilities with functional incubators although, observed differences were not statistically significant. The level of knowledge also increased with increasing number of years of practice up to 16 – 20 years after which it declined.

Table 5 shows the relationship between the attitude level towards KMC and some variables [17]. The attitude level towards KMC was significantly higher among respondents that worked in facilities that care for sick neonates ($p = 0.047$), those that worked in facilities with functional incubators ($p = 0.040$) and those that worked in facilities that practice KMC ($p = 0.003$). The level of attitude towards KMC was also higher among males, doctors, paediatricians, those that practiced in the southern part of the country and neonatologists but the observed differences were not statistically significant. The level of attitude towards KMC appeared to steadily decline with increasing care level of facilities where respondents

practiced from 100.0% in primary care level practitioners to 86.2% in tertiary care level practitioners.

After correcting for practice of KMC in the hospitals in which the health workers worked, Nurses were more likely to have a poor knowledge of KMC (OR, 3.8, 95% CI 1.2 to 12, $P = 0.02$)

4. DISCUSSION

Kangaroo mother care is a safe and effective low-cost intervention in the care of preterm and low birth weight babies. For the promotion of successful KMC, knowledge and attitudes of health workers is essential. There is a paucity of studies on the knowledge and attitude of health workers towards KMC in the Sub-Saharan Africa. This study shows a high level of knowledge (90.4%) of KMC among Nigerian health workers, which exceeds their level of attitude (86.6%) towards the practice of KMC. The high knowledge of KMC among health workers in the

Table 4. Relationship between level of knowledge of KMC and some variables

Variable		Level of knowledge of KMC			P
		Good	Moderate /Poor	Total	
Gender	Male	55 (88.7)	7 (11.3)	62 (39.5)	0.589
	Female	87 (91.6)	8 (8.4)	95 (60.5)	
Occupation	Doctor	114 (93.4)	8 (6.6)	122 (77.7)	0.017*
	Nurse	28 (80.0)	7 (20.0)	35 (22.3)	
Specialty	Paediatrician	111 (93.3)	8 (6.7)	119 (75.8)	0.033*
	Non –paediatrician	31 (81.6)	7 (18.4)	38 (24.2)	
Subspecialty	Neonatologist	25 (96.2)	1 (3.8)	26 (16.6)	0.249
	Non – neonatologist	117 (89.3)	14 (10.7)	131 (83.4)	
Location of health facility	North	37 (86.0)	6 (14.0)	43 (27.4)	0.249
	South	105 (92.1)	9 (7.9)	114 (72.6)	
Care level of health facility	Primary	1 (100.0)	0 (0.0)	1 (0.6)	0.752
	Secondary	16 (88.9)	2 (11.1)	18 (11.5)	
	Tertiary	125(90.6)	13 (9.4)	138 (87.9)	
Care for sick neonates in facility	Yes	141 (91.6)	13 (8.4)	154 (98.1)	0.024*
	No	1 (33.3)	2 (66.7)	3 (1.9)	
Availability of incubators in facility	Yes	78 (91.8)	7 (8.2)	85 (54.1)	0.541
	No	64 (88.9)	8 (11.1)	72 (45.9)	
Practice of KMC in facility	Yes	80 (95.2)	4 (4.8)	84 (53.5)	0.027*
	No	62 (84.9)	11 (15.1)	73 (46.5)	
Years of practice	<5	7 (77.8)	2 (22.2)	9 (5.7)	0.447
	5 – 10	43 (93.5)	3 (6.5)	46 (29.3)	
	11 – 15	43 (93.5)	3 (6.5)	46 (29.3)	
	16 – 20	16 (94.1)	1 (5.9)	17 (10.8)	
	>20	33 (84.6)	6 (15.4)	39 (24.8)	

* = significant

Table 5. Relationship between level of attitude towards KMC and some variables

Variable		Level of attitude towards KMC			p
		Good	Moderate /Poor	Total	
Gender	Male	54 (87.1)	8 (12.9)	62 (39.5)	0.888
	Female	82 (86.3)	13 (13.7)	95 (60.5)	
Occupation	Doctor	107 (87.7)	15 (12.3)	122 (77.7)	0.458
	Nurse	29 (82.9)	6 (17.1)	35 (22.3)	
Specialty	Paediatrician	104 (87.4)	15 (12.6)	119 (75.8)	0.616
	Non -paediatrician	32 (84.2)	6 (15.8)	38 (24.2)	
Subspecialty	Neonatologist	23 (88.5)	3 (11.5)	26 (16.6)	0.527
	Non - neonatologist	113 (86.3)	18 (13.7)	131 (83.4)	
Location of health facility	North	37 (86.0)	6 (14.0)	43 (27.4)	0.896
	South	99 (86.8)	15 (13.2)	114 (72.6)	
Care level of health facility	Primary	1 (100.0)	0 (0.0)	1 (0.6)	0.435
	Secondary	16 (88.9)	2 (11.1)	18 (11.5)	
	Tertiary	119 (86.2)	19 (13.8)	138 (87.9)	
Care for sick neonates in facility	Yes	135 (87.7)	19 (12.3)	154 (98.1)	0.047*
	No	1 (33.3)	2 (66.7)	3 (1.9)	
Availability of incubators in facility	Yes	78 (91.8)	7 (8.2)	85 (54.1)	0.040*
	No	58 (80.6)	14 (19.4)	72 (45.9)	
Practice of KMC in facility	Yes	79 (94.0)	5 (6.0)	84 (53.5)	0.003*
	No	57 (78.1)	16 (21.9)	73 (46.5)	
Years of practice	<5	7 (77.8)	2 (22.2)	9 (5.7)	0.498
	5 - 10	41 (89.1)	5 (10.9)	46 (29.3)	
	11 – 15	38 (82.6)	8 (17.4)	46 (29.3)	
	16 – 20	14 (82.4)	3 (17.6)	17 (10.8)	
	>20	36 (92.3)	3 (7.7)	39 (24.8)	

* = significant

Table 6. Multivariable logistic regression for poor knowledge of KMC

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for exp (B)	
							Lower	Upper
Step 1^a								
Occupation(1)	1.339	.575	5.422	1	.020	3.814	1.236	11.771
KMCpractice	1.329	.621	4.586	1	.032	3.777	1.119	12.745
Constant	-3.464	.589	34.611	1	.000	.031		

a. Variable(s) entered on step 1: Occupation (1) = Nurse, KMCpractice.

present study is comparable to that of 95.5% among health care providers in Kenya [18]. A multi-country analysis of health system bottlenecks towards KMC including only African and Asian countries revealed that 4 out of 12 Countries (33.3%) showed poor knowledge and awareness of health workers regarding importance and utility of KMC and 3 out of 12 (25.0%) showed negative health worker attitudes towards KMC [19].

The immediate effect of KMC is to prevent prolonged separation of the mother and her LBW infant which can contribute to an increase in morbidity, insufficient breast milk volume, poor growth and poor mother-to-infant bonding [20]. In the present study, the most popular knowledge

statement that respondents strongly agreed with was that KMC promotes bonding (97.4%). This was consistent with findings in Kenya [19], Egypt [21] and Sweden [22] where a majority of the health care staff strongly agreed that KMC promotes bonding. On the other hand, fewer (31.7%) health workers in Ahmedabad, India [23] agreed with the same benefit of KMC. The Indian study was among grass-root health workers, unlike the present study that comprised mainly of doctors and some nurses working predominantly in tertiary health centers where high level of neonatal care is rendered. Similarly, the studies in Egypt and Sweden were conducted mainly among neonatal intensive care staff. The Kenyan study on the other hand, was conducted among staff of district hospitals which are like secondary

level health care facilities, midway between primary and tertiary.

A number of studies have investigated the physiological effects of KMC when used with premature infants and reported that with KMC, the premature infants typically snuggles into the breast and is deeply asleep within just a few minutes, Maternal breast milk supply becomes streamlined, making it easier for the mother to breastfeed the offspring for a longer duration [24,25]. A high percentage of respondents in this study also agreed strongly that KMC promotes effective exclusive breast feeding, promotes infant wellbeing and enhances parental confidence. This finding is mirrored in similar studies [18,21-23].

Majority of the respondents in this study were of the opinion that KMC should not be practiced in intubated infants. Hesitance towards KMC for intubated infants has been seen in other studies [25,26]. However, research by Ludington-Hoe et al. [27] show no obstacle to KMC with intubated infants if the unit has clear guidelines on how to handle the intubated infants during KMC. KMC has even been stated to yield better oxygen saturation in intubated infants [28]. This highlights the need for guidelines in KMC practice in Nigerian healthcare institutions. A previous study [17] of Nigerian health workers noted that over half of the institutions did not have a written policy on KMC. Further research to assess the organizational readiness of hospitals in Nigeria to implement KMC is therefore recommended. We also recommend additional questions in future research concerning the existence, quality, frequency of revision and implementation of protocols regarding KMC in health care settings as this reflects in part, the knowledge and attitude of the healthcare workers, considering they are usually directly responsible for the custody of these protocols in the facilities.

It has been found that a key factor in developing a positive attitude is that staff find the facilitation of KMC to be professionally satisfying. Members of neonatal staff expressed a sense of excitement and enthusiasm about using the method, which is an important aspect of the implementing process [29]. When staff observed the improved wellbeing of parents and preterm infants during KMC, it gave them motivation to work towards further improvement [30]. As high as 91.1% of respondents in the present study strongly agreed that KMC facilitation was professionally satisfying. Similar results were

noted in other studies in Egypt [21] and Sweden. [22].

In some studies, [29] staff identified a heavy workload as an obstacle to the implementation of KMC in the NICU, although, research by Ludington-Hoe et al. [31] shows that KMC does not significantly increase nurses' workload. As seen in other studies in Sweden, [22] South Africa [32] and Kenya, [18] as low as 18.5% of the respondents in the present study thought KMC facilitation increases work load of staff. Engler et al. [33] reported that nurses who perceived the practice of KMC to be beneficial to themselves (by decreasing their workload), and the infant, were more willing to implement KMC in their units. Reasons for resistance to KMC implementation by nursing staff in developing countries included their perception that KMC is sub-standard, and that it represents extra work for staff [34].

The finding in the present study of increasing level of knowledge of KMC with increasing number of years of practice up to 16-20 years is a bit similar to findings by Wallin et al in Canada [30] and Johnson in Newark, United States of America [35] who found that nursing staff who worked longer than five (5) years with kangaroo mothers or mothers with LBW infants were more likely to institute KMC, whilst those with less than five (5) years experience needed continuous monitoring. They recommended that a staff mix of experienced and less experienced nursing staff is therefore essential to complement the less experienced ones on the same shift at health facilities. The decline in knowledge above twenty years of experience noted in this study may be due to the time KMC was gradually introduced into the country which was about 2 decades ago and the time it took for training the health workers, as a result those older than 20 years are not familiar to the practice. It could also be as a result of reduced direct practice with neonates requiring KMC due to specialization in other areas by these health staff.

Although the level of knowledge of KMC in the present study was significantly higher among doctors, paediatricians, respondents that worked in facilities that care for sick neonates and those that worked in facilities that practice KMC, the level of attitude was significantly higher only among respondents that worked in facilities that care for sick neonates, those that worked in facilities with functional incubators and those that worked in facilities that practice KMC. This shows high level of knowledge does not readily

translate to a good attitude towards the practice of KMC. Those respondents that were continuously involved in the care of sick newborns and consistently practiced KMC at their places of work had good knowledge and good attitude towards KMC. This may be a reflection of the professional satisfaction derived from practicing KMC and sustained knowledge derived from constant practice. The steady decline in attitude towards KMC with increasing level of health care facility noted in the present study on the other hand, may be due to the absence of steady power supply and incubators often encountered in areas where primary health care facilities are situated. Health workers in these low care-level facilities may, therefore, practice KMC more frequently out of necessity and therefore develop a better attitude towards the practice in the long run.

Training opportunities should be created to address misconceptions about, as well as gaps in knowledge, on this subject. Engler et al. [33] recommend that training opportunities should emphasize the facts related to, and abilities required for, safe and effective KMC practice, and should also incorporate a supervised, hands-on practical experience component. Bergh et al. [36] added that ongoing, on-site training resulted in the most successful implementation of KMC.

We recommend the continued training and re-training of health care workers on the knowledge and implementation of KMC as this will enhance and sustain the knowledge of this very affordable but tremendously impactful health care practice especially in resource-poor settings. There is a need for further research on the reasons for knowledge-attitude gap regarding KMC among all health workers so that solutions can be proffered to bridge this gap and ultimately enhance the practice of KMC.

The convenience sampling method used in the present study poses as a limitation as the sample was biased to only those attending the conference. However, various cadres of health personnel drawn from almost all the States in the Country were represented at the conference. This however is not as representative as a probability sampling.

5. CONCLUSION

This study shows a generally good knowledge of KMC among health workers, although higher than the level of attitude exhibited

towards its practice. Given the unacceptably high neonatal mortality rates and low birth weight rates in Nigeria, good knowledge and attitudes in the practice of KMC among health workers towards a reduction in the neonatal morbidity and mortality cannot be over-emphasized.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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