

HAND HYGIENE: THE IMPACT OF INCENTIVE STRATEGIES ON ADHERENCE AMONG HEALTHCARE WORKERS FROM A NEWBORN INTENSIVE CARE UNIT

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Neves ZCP, Tipple AFV, Souza ACS, Pereira MS, Melo DS, Ferreira LR. Hand hygiene: the impact of incentive strategies on adherence among healthcare workers from a newborn intensive care unit. Rev Latino-am Enfermagem 2006 julho-agosto; 14(4):546-52.

We carried out a before-after non-controlled intervention study to assess the impact of different handwashing strategies in health care workers at a neonatal ICU in Goiânia - Goiás, Brazil. All ethical aspects were considered. Data was collected by using a check list in order to register hand hygiene opportunities during six months. Three strategies were elaborated together with the hospital team. We observed 1358 handwashing opportunities. Incentive strategies caused a small impact on the increase of adherence to hand hygiene during and after the implementation period. However, we noticed that this increase mainly occurred after the procedures were realized. On the whole, adherence levels were similar before (62.2%) and after (61.6%) the procedures. The study showed that health care workers were more worried about individual risks.

DESCRIPTORS: handwashing; continuing education; cross infection, nursing

HIGIENIZACIÓN DE LAS MANOS: EL IMPACTO DE ESTRATEGIAS QUE INCENTIVEN LA ADHESIÓN ENTRE LOS PROFESIONALES DE LA SALUD DE UNA UNIDAD DE TERAPIA INTENSIVA NEONATAL

Con objeto de evaluar el impacto del uso de diferentes estrategias que incentiven la higienización de las manos entre profesionales de la salud en una unidad de cuidados intensivos neonatales en Goiânia - Goiás, Brasil, efectuamos un estudio de intervención no controlada, denominada antes-después. Observados los aspectos éticos, los datos fueron recolectados utilizándose un check list para registrar las oportunidades de higienización de las manos, por seis meses. Utilizamos tres estrategias de incentivo construidas con la participación de los grupos de la institución. Fueron observadas 1358 oportunidades de higienización de las manos. Las estrategias de incentivo consiguieron un pequeño impacto en el aumento de la adhesión de la higienización de las manos en los periodos durante y después de su implementación. Este aumento ocurrió principalmente después de la realización de los procedimientos. En la adhesión total, los porcentajes fueron semejantes antes (62,2%) y después (61,6%) de la ejecución de procedimientos. El estudio señala una mayor preocupación de los profesionales con el propio riesgo.

DESCRIPTORES: lavado de manos; educación continua; infección hospitalaria; enfermería

HIGIENIZAÇÃO DAS MÃOS: O IMPACTO DE ESTRATÉGIAS DE INCENTIVO À ADESÃO ENTRE PROFISSIONAIS DE SAÚDE DE UMA UNIDADE DE TERAPIA INTENSIVA NEONATAL

Com o objetivo de avaliar o impacto do uso de diferentes estratégias de incentivo à higienização das mãos de profissionais de saúde de uma UTI neonatal em Goiânia - GO, realizou-se um estudo de intervenção não controlada, denominado antes-depois. Observados os aspectos éticos, os dados foram coletados, utilizando-se um check list para o registro das oportunidades de higienização das mãos, por seis meses. Utilizaram-se três estratégias de incentivo, construídas com a participação das equipes da instituição. Foram observadas 1358 oportunidades de higienização das mãos. As estratégias de incentivo promoveram pequeno impacto no aumento da adesão à higienização das mãos nos períodos durante e após a sua implementação, sendo que esse aumento ocorreu, predominantemente, no momento posterior à realização dos procedimentos. Na adesão global, os percentuais foram semelhantes antes (62,2%) e após (61,6%) a execução de procedimentos. O estudo sinaliza maior preocupação dos profissionais com o risco individual.

DESCRIPTORES: lavagem de mãos; educação continua; infecção hospitalar; enfermagem

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INTRODUCTION

Hospital infections (HI) represent an important public health problem in Brazil and the rest of the world and poses risks to the health of hospital users submitted to therapeutic or diagnostic procedures. Its prevention and control largely depend on health professionals' adherence to preventive measures⁽¹⁾.

In 1843, Oliver Wendel Homes suggested that physicians unconsciously were the greatest cause of infectious complications in parturient women and newborns, due to the lack of hand washing. In addition, Ignaz Philipp Semmelweis established the first scientific evidence that hand washing could avoid the transmission of puerperal fever by using a solution of chlorinated water and soap for hand washing among care professionals. He managed to reduce infection numbers from 18.27% to 3.07% within two months⁽²⁾.

Hence, hand washing is not recent as a recommended measure for infection control. It should be done before and after patient contact, before and after using gloves, between one patient and another, between one procedure and another and in cases of pathogen transference to patients and environments, in between procedures with the same patient and after contact with blood, body fluids, secretions, excretions and contaminated articles or equipment⁽³⁻⁵⁾.

Despite the epidemiological importance of hand washing to prevent hospital infections, adherence to this measure has been one of the main challenges for Hospital Infection Control Commissions - HICC. This involves, among other aspects, human resources at the health institutions, their preparation and awareness⁽⁶⁾. Hospital infections are frequently associated with health professionals' low adherence to hand washing⁽⁷⁻⁸⁾.

This challenge is even greater at neonatal units, where infection processes are the main factors responsible for high morbidity and mortality during this period. In patients with an immature immune system and greater exposure to invasive procedures, it is hard to prevent and control HI. Technological advances have increased the survival of premature newborns and infants with severe diseases are the main responsables for successful life maintenance⁽⁷⁾.

Literature presents different motives for low adherence to hand washing, such as lack of motivation, absence of sinks and adequate resources close to the patient, cutaneous reactions on the hands,

lack of time, irresponsibility, lack of awareness about the importance of the hands in the transmission of microorganisms⁽⁸⁻⁹⁾.

The use of traditional practices and teaching forms used in continuing education programs, almost always associated with punitive practices, does not manage to reach the receiver in an effective way and impairs the final result. Thus, different strategies that involve the receiver in the construction of their own professional knowledge create awareness for them to change their behavior⁽¹⁰⁾.

Learning should be relevant for the subject, who needs to get involved with ideas, feelings, and the cultural aspects of each society, with a view to becoming a social practice. The more significant the learning experience, the greater its impact will be, becoming an instrument needed to transform daily practice⁽¹¹⁾.

This study introduced different strategies and covered a longer period than education campaigns, increasing the team's access to information about the importance of hand washing for HI control. We believe that strategies implemented on a continuous base are one of the ways to promote behavioral changes. Thus, we hope that infection control will influence the professionals' hands and awareness.

In this study, hand washing was considered as all situations in which water and soap, 70% alcohol with glycerin or gel alcohol were used. We aimed to assess the impact of using different hand washing incentive strategies among health professionals at a neonatal ITU.

METHODOLOGY

We carried out a non-controlled before-after intervention study, during which individuals, who act as their own controls, are submitted to a specific treatment (or exposure) and are compared with periods when a different treatment (or exposure) was used. No parallel group is constituted⁽¹²⁾. The study was developed at a Neonatal Intensive Therapy Unit of a teaching hospital maintained by the Health Secretary of the State of Goiás. Ethical approval was obtained from the study institution. This medium-size institution is a reference hospital for high-risk health care in the maternal-infant area for the entire state as well as neighboring states. Care is provided through the SUS (Single Health System)

The unit consists of nine beds: six in the main structure, one in isolation and two private rooms. The physical structure attends to the Joint Directory Resolution - RDC 50/ Anvisa (Brazilian Health Surveillance Agency), issued on February 21st 2002, which determines on the obligatory presence of one sink for every five beds outside isolated rooms⁽¹³⁾.

Study participants included all professionals who voluntarily agreed to participate and worked in the three shifts of the neonatal ITU. Ten (10) research auxiliaries, who were grant holders in the Scientific Initiation Program (PIBIC/ PIVIC/ CNPq), affiliated with the Hospital Infection Study and Research Group (NEPIH) at the Faculty of Nursing (FEN) of the Federal University of Goiás (UFG), collected data through direction observation of the team that delivered care to the newborns.

For the observation, we used a check list, which was analyzed by specialists and submitted to a pilot test, involving six (06) professionals who work at the pediatric ITU of the same hospital.

Data were collected during six months: two months were used for a situational diagnosis; the following two months for applying the hand washing incentive strategies and the last two for assessment.

The Hospital Infection Control Commission/ Service (CCIH/SCIH) disseminated in the entire hospital that the annual hand washing campaign would be held during this period. Strategies were introduced in the same way in all hospital units.

Hand hygiene was observed before and after the realization of procedures in the three shifts, during 06 hours in the day shifts and 03 hours at night (we chose the initial period of each shift, when most procedures are carried out). Observations corresponded to 36 hours before, 72 h during and 72 h after interventions, totaling 180 hours.

We used three intervention strategies.

Musical parodies on hand hygiene

The parodies were composed by hospital team members, including physicians, nurses, nursing auxiliaries and technicians, nutritionists, nutrition auxiliaries and laboratory technicians, as part of a contest promoted during a hand washing campaign by the CCIH/SCIH. We chose the winning songs, with lyrics and refrains that were easy to remember and well accepted melodies.

This strategy was chosen because we observed that, during an earlier hand washing campaign, professionals remembered songs more easily and, when they remembered, they immediately washed their hands and asked their colleagues to do the same.

A CD with five musical parodies was recorded by the band Mão Beleza ("Beautiful Hand"), whose members were professionals from the neonatal ITU team. All ethical aspects of copyright were respected for this recording. We received support from the UFG University Radio.

These parodies were put on the air by the hospital's radio service at least once per shift until 22:00 hours, every day of the week, during the two months of the incentive period.

Artistic information posters

Based on a study about Visual Communication in Hospital Infection Prevention⁽⁸⁾, we elaborated eight artistic information posters, with the cooperation of a nursing academic from FEN/UFG, who represented the suggested situations with his own creations. The posters were signed by the author, mentioning the original source of the idea.

We put up these posters in strategic places, such as the access control watch, located in a site all professionals had to access and on the notice board of each clinic. A timetable was set for changing the posters, which were transferred between different sites every four days, considering the changes in most hospital team members' work shifts.

Phrases on hand hygiene

We chose ten phrases, elaborated by health team professionals from the study hospital on the occasion of previous hand washing campaigns promoted by the hospital's CCIH/SCIH. These phrases were disseminated by the radio service, alternating with the songs, at least once per shift during all days of the week across the two-month intervention period and written on posters with colored highlights, displayed close to the artistic information posters.

Excel was used for data processing and statistical analysis, together with Epi-info 2000, version 3.2, and tables were used to present the results. The chi-square test was used, considering $p < 0.05$.

RESULTS AND DISCUSSION

The permanent health team at the neonatal ITU under study consisted of 80 professionals, with the support of other external professionals from the clinical analysis laboratory, blood bank, pediatric surgery team and imagery sector. We observed sixty-nine internal and external professionals, as shown in Table 1.

Table 1 - Number and percentage of professionals observed during the six-month study period according to category. Goiânia - GO. Nov/2003 - May/2004

Professional category	Nº	%
Nursing technician/ auxiliary	37	53.6
Physician	15	21.7
Nurse	08	11.6
Clinical analysis technician/ auxiliary	04	5.7
Physiotherapist	02	2.9
Hemotherapy technician	01	1.5
Imagery technician	01	1.5
Speech and hearing therapist	01	1.5
Total	69	100

More than half (65.2%) of the professionals observed at the neonatal ITU were nursing team members. We know that this team is responsible for the highest percentage of direct and continuing patient care. This confirms that, at most Brazilian health institutions, the nursing team quantitatively represents this highest percentage⁽¹⁴⁾ and establishes a direct relation with HI prevention and control measures. The medical team also corresponds to a significant percentage, with 15 professionals (21.7%) who are continuously present, as this is an intensive therapy unit.

The study unit partially attends to the requirements established in Decree MS/ GM No 3432, dated August 12th 1998, which determines criteria for ranking Intensive Therapy Units. The unit is classified as a Type II Pediatric ITU and, what the number of health team members is concerned, an exclusive physician on duty is missing for up to ten patients or a fraction, as well as a nursing technician/auxiliary in the three shifts, considering the nine existing beds. Guaranteeing the quantitative and qualitative presence of professionals minimizes stress among team members as a result of the work overload, which may result in iatrogenic diseases.

We observed adherence to hand washing in 1358 procedures, totaling 180 hours across the three shifts. Only procedures observed before and after their execution were included. Table 2 presents the percentages of observations before and after the execution of procedures during the study period.

Table 2 - Number and percentage of global adherence to hand hygiene before and after the realization of procedures during the study period. Goiânia - GO. Nov/2003 - May/2004

Global adherence	Before	%	After	%
Yes	845	62.26	836	61.60
No	513	37.74	522	38.40
Total	1358	100	1358	100

It is remarkable that adherence percentages were similar before and after the realization of care procedures. More than half of the professionals adhered to hand washing. Nevertheless, we are still distant from the ideal levels for HI prevention, that is, whenever necessary.

In approximately 38.0% of the procedures, professionals did not adhere to hand washing. This indicates that the executed care represented high risks for the transmission of microorganisms that could lead to HI, mainly in newborns, whose immunity barrier is being formed. Material resources did not represent an obstacle for hand hygiene, since we observed that liquid soap, paper towels and a dispenser with alcohol at 70% were present at all sinks during the data collection period.

We found low acceptance levels for gel or 70% alcohol with glycerin, which were used by 2.6% and 1.7%, respectively, before and after the realization of procedures. Gel alcohol is easy to use and handle; its application requires less time; the product can be placed at the patient's bedside and displays rapid antimicrobial action⁽¹⁵⁾. In spite of these facilities, health professionals at this neonatal ITU were resistant to its use, as opposed to international literature, which reports excellent adherence to the use of this alcohol solution⁽⁴⁾.

Table 3 shows adherence to hand washing before and after the realization of procedures, before, during and after the application of incentive strategies.

Table 3 - Number and percentage of hand hygiene before and after the realization of procedures during the study period. Goiânia - GO. Nov/2003 - May/2004

Incentive period/ Hand hygiene	Before		During		After		Total Nº
	Nº	%	Nº	%	Nº	%	
Before procedure							
Yes	188	22.1	359	42.4	298	35.3	845
No	126	24.4	189	36.9	198	38.5	513
Total	314		548		496		1358
After procedure							
Yes	172	20.6	363	43.5	299	35.8	834
No	142	26.9	186	35.3	196	37.6	520
Total	314		549		495		1358

Authors emphasize the importance of continuing education programs so as not to decrease their effect after some time⁽⁴⁻¹⁶⁾. In this study, incentive strategies were maintained for two months. Table 3 shows a small impact on adherence to hand hygiene during the implementation of these strategies and a decrease in adherence levels once they had ended (respectively: 22.1%, 42.4%, 35.3% of adherence before the realization of the procedures and 20.6%, 43.5%, 35.8% afterwards). Adherence levels after the strategies were higher than in the preceding period.

We observed that professionals used the information offered by the strategies. However, the stimuli led to the repetition of their action only during the intervention period, decreasing afterwards. This happened despite the implementation time of the intervention strategies, their innovative nature and the hospital professionals, mainly ICU professionals' involvement in their construction. Further research is needed to analyze the factors that contributed to this fact.

We believe that the CCIH/SCIH should promote permanent education for infection control in health institutions, in their search for means that promote more effective and long-term changes. However, in our perspective, adherence is a voluntary and individual act that depends on each professional's decision. In this sense, it is influenced, among other factors, by care professionals' inherent complexity.

We used the chi-square test to understand adherence-related factors and found a statistically significant difference only after the execution of care procedures ($p= 0.001$) when comparing the period before and during the application of the intervention strategies. Thus, adherence levels increased when the incentive strategies were introduced, but predominantly after the realization of the procedures.

Some studies corroborate our results about higher adherence levels when incentives are used and after care procedures are realized, evidencing professionals' concern about not exposing themselves to the risk of catching a disease⁽⁹⁻¹⁷⁾.

Table 4 lists professionals' adherence to hand washing according to the involved procedures.

Table 4 - Hand hygiene adherence behavior after realization of the procedures during the study period, according to the procedure carried out. Nov/ 2003 - May/ 2004. Goiânia - GO

Tipos de Procedimentos	Adesão				Total
	Sim	(%)	Não	(%)	
Medication preparation	52	(89.6)	06	(10.4)	58
Speech and hearing science procedures	14	(87.5)	02	(12.5)	16
Orotracheal and endotracheal aspiration	50	(78.1)	14	(21.9)	64
Orogastric intubation	20	(76.9)	06	(23.1)	26
Physiotherapy procedures	58	(75.3)	19	(24.7)	77
Multiple procedures *	51	(72.9)	19	(27.1)	70
Decubitus change	34	(68.0)	16	(32.0)	50
Wound dressing	04	(66.7)	02	(33.3)	06
Infant washing	126	(63.6)	02	(36.4)	198
Venal / arterial puncture	39	(62.9)	23	(37.1)	62
Physical examination	112	(61.5)	70	(38.5)	182
Infant handling	31	(60.8)	20	(39.2)	51
Diet administration	92	(55.8)	73	(44.2)	165
Glycemia testing	34	(51.5)	32	(48.5)	66
Blood collection	17	(51.5)	16	(48.5)	33
Medication administration	75	(50.3)	74	(49.7)	149
Changing oxymeter sensor	17	(47.2)	19	(52.8)	36
Reanimation	04	(50.0)	04	(50.0)	08
Weighing infants	01	(50.0)	01	(50.0)	02
Oxygen administration	01	(50.0)	01	(50.0)	02
Other procedures	06	(16.2)	31	(83.8)	37
Total	838	(61.7)	520	(38.3)	1,358

* Multiple procedures = realization of various sequential procedures.

These figures show that adherence levels are highest after medication preparation, followed by risk of contact with secretion, such as speech and hearing science procedures, which involve oral secretion because they stimulate newborns' oral suction; aspiration; orogastric intubation and physiotherapy

procedures, during which the bronchial tree is aspirated.

Hand washing after medication preparation minimizes the risk of professionals' chemical exposure to medication. However, in view of biological risk, it should be highlighted that, before medication

preparation, hand hygiene only occurred on six occasions. This is fundamental to maintain the aseptic technique and avoid contamination risks. In other procedures, adherence to hand washing may be related to increased risks of contact with body secretions.

Particularly venal puncture is an important cause of hospital infections and an indispensable procedure in modern care practice. Therefore, adherence to hand hygiene is essential in vascular access procedures, as the inadequate maintenance of this site increases infection risks. In this study, 244 of the procedures we observed referred to vascular access, including medication administration, venal/arterial puncture and blood collection. Adherence to hand hygiene occurred in 127 (52.1%) cases, against 113 cases (47.9%) of non-adherence.

This information is a source of concern, as vascular access infection at a neonatal ITU increases morbidity and mortality, due to the fact that most patients are premature and more susceptible to HI. These children are excessively handled and frequently subject to invasive procedures, such as central and peripheral catheters and venal puncture, due to the need for blood monitoring.

We examined the frequency of hand washing according to professional category. In general, we found the following percentages during the study period: physiotherapists (77.7%), medical team (75.9%), nurses (74.3%), nursing technicians/auxiliaries (57.2%), speech and hearing scientists (50%) and, finally, laboratory technicians (32.4%).

Adherence to hand washing was higher among professionals with higher education. The highest levels were found among physiotherapists, in line with other studies⁽¹⁷⁻¹⁸⁾, although this category represents a smaller group. Moreover, we found higher levels for medical team members in comparison with other studies, and also when compared with nurses⁽¹⁰⁾.

Laboratory technicians displayed the lowest adherence levels. This is an important observation, as these professionals have access to different hospital units and their hands can be a crossed contamination vehicle. We know that they should use gloves for most activities. However, this does not mean that hand washing is not necessary before putting on and after taking off the gloves⁽⁴⁻⁵⁾.

The use of the chi-square test to analyze the same professional category's adherence behavior across the study period allowed us to identify that,

among nursing auxiliaries/technicians, adherence levels were higher after the realization of care procedures during ($p=0.02$) and after ($p=0.03$) the incentive strategies.

These data are relevant, since professionals from this category are most numerous and carry out most care activities. However, the time of adherence, after the realization of the procedures, confirms that workers are more preoccupied with protecting their own health, and less with minimizing risks that threaten the newborns' clinical condition. For the other professional categories, we did not find any significant difference among the three study periods (before, during and after the implementation of the incentive strategies).

CONCLUSION

This research about the adherence of health team members to hand washing allowed us to conclude that, at the neonatal ICU under study:

- the physical space and the availability of sinks with liquid soap, paper towels and antiseptic agents comply with recommendations;
- in the permanent health team, an exclusive physician on duty is missing for up to ten patients or a fraction, as well as a nursing technician/auxiliary in the three shifts, considering the nine existing beds;
- on the whole, adherence percentages were similar before (62.26%) and after (61.60%) the realization of the care procedures;
- adherence to gel alcohol or alcohol with glycerin corresponded to 2.6% before and 1.7% after the procedures;
- incentive strategies promoted a small impact on adherence to hand hygiene during and after the implementation of these strategies and a decrease in adherence levels after they had ended;
- the introduction of strategies mainly increased adherence after the realization of care procedures;
- adherence levels were more frequent after the realization of care procedures that involved greater possibility of exposure to chemical and biological risks;
- the analysis of the same professional category's adherence behavior indicated that nursing auxiliaries/technicians presented greater adherence to hand hygiene after the realization of care procedures during ($p=0.02$) and after ($p=0.03$) the application of incentive strategies. No significant differences were found for other professional categories;

- we observed 244 procedures related to vascular access. Adherence to hand hygiene occurred in 127 (52%) cases, against 113 (48%) of non-adherence;
- global adherence levels per professional categories corresponded to: physiotherapists (77.7%), medical team (75.9%), nurses (74.3%), nursing technicians/ auxiliaries (57.2%), speech and hearing scientists (50%) and, finally, laboratory technicians (32.4%).

Although the importance of higher adherence among nursing technicians/auxiliaries is in line with the time they spend on direct patient care, we found a statistically significant difference only after the realization of the care procedures. This may indicate that professionals are more concerned with protecting themselves than with their patients.

Unfortunately, the results of our study, which used different strategies to encourage hand washing, during a longer period than in traditional campaigns, and constructed in cooperation with health

professionals, were not so animating. We found similar levels before and after our interventions. This indicates that the strategies we implemented did not lead to a critical reflection that could result in behavioral change.

The course followed in this study, as well as our conclusions, revealed that we should reconsider our professional practice in terms of facilitating infection control through permanent education processes, with a view to prophylaxis and infection control at health services. We believe there is a need to change our focus from the "obsessed" look to expected action, i.e. hand hygiene, for example, for the author of the action, the health professional, the human being with his/her beliefs, values and principles.

We hope that this study supports other studies and unveils possibilities to change professionals' behavior by favoring hand hygiene.

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