Hand hygiene adherence rate before and after the plan-do-check-act strategy

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ABSTRACT

Introduction: The application of the PDCA cycle in the management of hand hygiene among healthcare workers was investigated. In order to prepare a better plan for enhancing compliance with hand hygiene among healthcare workers, the PDCA cycle was utilized to compile issues with the medical staff's hand hygiene.

Aim: The purpose of this study was to assess the rate of hand hygiene compliance before and after the PDCA technique was implemented.

Methods: The informed observation was done by the head nurses under the leadership of infection control nurses in the entire hospital using "Five Moments for Hand Hygiene" for a period of six months. The healthcare worker's hand hygiene compliance before and after the implementation of measures was managed by the PDCA cycle.

Results: Before the implementation of the PDCA cycle, the implementation rate of hand-washing was 50.31% and after the implementation of the PDCA cycle, the implementation rate of hand-washing was 94.83%.

Conclusion: The PDCA cycle strategy can improve healthcare workers' hand hygiene compliance in hospitals.

KEYWORDS: Hand hygiene audit, Plan-do-check-act (PDCA), Hand hygiene adherence rate.
INTRODUCTION:

Healthcare associated infections (HAI) are one of the most common adverse events in Health care facilities. Healthcare associated infections have many impacts on public health leading to morbidity, mortality, and decreased quality of life. Hand hygiene is one of the main components of standard precautions taken to prevent: Healthcare associated infections.\textsuperscript{1,2} WHO has given “My 5 moments of hand hygiene” to control infections which can transfer through hands (FIG 1).\textsuperscript{3,4} Most common approach to improve hand hygiene compliance surveillance is by direct observation.\textsuperscript{5} Plan-Do-Check-Act (PDCA) strategy is the standard method for health care to achieve quality and safety (FIG 2). Thus, this study aimed to compare the compliance rate before and after the PDCA procedure to hand hygiene.

![FIG 1: WHO “my 5 moments of hand hygiene](image)

![FIG 2: PDCA CYCLE](image)

METHODS:

The study was carried out in the Microbiology department, LNCT Medical College and Sewakunj Hospital, Indore. It was an interventional study done for a period of six months from 01 March 2022 to 31 August 2022. In this study, a total of 280 Health care workers were observed after taking informed consent. The entire hospital was observed for five moments of hand hygiene developed by WHO for a period of 6 months. The Observation was done by the Nurse in charge of the ward under the leadership of the infection control nurse. The compliance rate was recorded in the Hand hygiene audit form (FIG2). For the initial 3 months (01-03-2022 to 31-05-2022), only a hand hygiene audit was done and for the later 3 months (01-06-2022 to 31-08-2022), the PDCA procedure was carried out.
strategy was followed along with a regular hand hygiene audit.

![Image of Hand hygiene audit form]

**FIG 2: Hand hygiene audit form**

The Hand hygiene adherence rate was calculated using the formula, Hand hygiene adherence rate (HHRA) = \( \frac{\text{No. of times hand hygiene followed completely}}{\text{No. of opportunities for hand hygiene moments available}} \times 100\% . \)

**RESULTS:**

<table>
<thead>
<tr>
<th>Table 1: demographic data</th>
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<tbody>
<tr>
<td>Investigation time</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
</tbody>
</table>
| 01-03-2022 to 31-05-2022 | 326 | Doctors – 88/120(73.33%)  
Nurses - 72/150(48%)  
New MBBS and Nursing students-4/56(7.14%) |
| 01-06-2022 to 31-08-2022 | 310 | Doctors-112/120(93.33%)  
Nurses-146/150(97.33%)  
New MBBS and Nursing students-36/40(90%) |

According to Table 1, before the PDCA strategy hand hygiene compliance was poor among all
healthcare workers, especially among new MBBS and nursing students. But after the application of the PDCA strategy hand hygiene compliance was increased among all healthcare workers.

Table 2: Comparison of the implementation rate of hand-washing before and after the implementation of PDCA in medical staff

<table>
<thead>
<tr>
<th>Investigation time</th>
<th>Observed moments</th>
<th>Compliance with hand hygiene</th>
<th>Hand hygiene adherence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-03-2022 to 31-05-2022</td>
<td>326</td>
<td>164</td>
<td>50.31%</td>
</tr>
<tr>
<td>01-06-2022 to 31-08-2022</td>
<td>310</td>
<td>294</td>
<td>94.83%</td>
</tr>
</tbody>
</table>

Table 2 depicts that for the initial 3 months (01-03-2022 to 31-05-2022), 164 actions were observed at 326 appropriate moments. Thus, the hand hygiene adherence rate was 50.31%. For the later 3 months (01-06-2022 to 31-08-2022), 294 actions were observed at 310 appropriate moments. Thus, the hand hygiene adherence rate was found to be 94.83%. Thus, there was a significant increase in hand hygiene adherence rate after applying the PDCA strategy (P value <0.01).

Discussion:

Hand hygiene compliance has a major role in preventing infections through contact. Despite the shreds of evidence demonstrating hand hygiene can decrease hospital-associated infection, compliance with hand hygiene is poor among healthcare workers.\(^1\)\(^,\)\(^2\)\(^,\)\(^6\)\(^,\)\(^7\) PDCA cycle is a management model proposed by Doctor Deming an American statistician, including cycles of 4 stages Plan, Do, Check, and Action for management.\(^8\) It is a circular system of quality management standardization and systematization and is widely used in the management of quality.\(^9\) So, this study tries to manage nosocomial infection in hospitals strictly in accordance with the steps of the PDCA cycle.

Before the PDCA strategy hand hygiene adherence rate was found to be 50.31% in our institute which is similar to the study done by Demirel A.\(^10\) After PDCA, the hand hygiene adherence rate increased to 94.83% which is similar to the study done by Chen P et al.\(^11\)

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After running PDCA program to analyze the factors that affected the hand hygiene were taken into account and were taken care off, thus increasing the hand hygiene adherence rate. Key problems that were addressed during the PDCA strategy include poor awareness of healthcare personnel especially new MBBS students and Nursing students, high personnel turnover rate, inadequate availability of hand disinfectant during ward rounds, and fewer number of caution reminders of hand hygiene. Actions taken to overcome these problems included hand hygiene posters display, hand hygiene training was made compulsory for the induction program of new health care workers, number of hand disinfectant were increased both in wards and OPD and WHO My moments of hand hygiene posters were displayed.

The application of the PDCA cycle could enable the medical staff to implement hand hygiene management measures.

**Conclusion:**

Although training is the simplest approach for hand hygiene but PDCA cycle can improve health hygiene compliance by improving every key problem attached to its adherence.

**Reference:**


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