



## **PERCEPTION OF NURSES ON IMPLEMENTATION OF POKA –YOKE IN HOSPITALS**

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**Abstract-** The implementation of Poka-Yoke in hospitals is an imperative step that must be adopted by the hospitals in order to avoid errors and create an error proof environment. But before implementation of Poka-Yoke in hospitals, it is important to understand the reasons behind as to why hospitals have till now not implemented and the aspects which require implementation of Poka-Yoke in hospitals. Thus, the present research will identify these reasons and aspects. The present research has been conducted in the city of Belagavi, Karnataka, India in the hospitals with ten or more beds.

**Keywords:** Poka-Yoke, Hospital Errors, Medical Errors

### I. INTRODUCTION

Hospital and medical errors are a grave threat to patient safety and is a leading cause of public health safety (Rodziewicz; et al., 2020). According to Patrice Spath “*If healthcare is to improve patient safety, systems and processes must be designed to be more resistant to error occurrence and more accommodating of error consequence*” (Spath, 2011, p. 220). Thus, in order to improve patient safety and overall healthcare, some processes have to be developed which can facilitate in avoidance of the errors.

Poka-Yoke is a Japanese term which means unintentional avoidance of error (Kulkarni et al., 2017). In other words Poka-Yoke can be stated to be error/mistake proofing. Many researchers have been conducted in past decade on implementation of Poka-Yoke in healthcare processes and have found positive outcomes (Agarkhed, 2015; Grout, 2006; Grout & Toussaint, 2010; Kovach et al., 2013; Kumar & Steinebach, 2008; Rao, 2020). Thus, it can be stated that implementation of Poka-Yoke in hospitals is an imperative step that must be adopted by the hospitals in order to avoid errors and create an error proof environment. But before implementation of Poka-Yoke in hospitals, it is important to understand the reasons behind as to why hospitals have till now not implemented Poka-Yoke and the aspects which require implementation of Poka-Yoke in hospitals. The present study will focus on identifying these aspects via perception of the nurses (as nurses are at the front line of patient care). The present research will thus facilitate in bridging the gap in existing literature on Poka-Yoke as none of the research was found to be specifically focused on finding the reasons behind as to why hospitals have till now not implemented Poka-Yoke and the aspects which require implementation of Poka-Yoke in hospitals.

### II. MATERIALS AND METHOD

The present research has been conducted in the city of Belagavi, Karnataka, India. The population of the city comprises of all the nurses in the hospitals with ten or more beds. A total of 84 nurses were approached using simple random sampling, out of which 62 completely filled questionnaires were received. Thus the response rate of the study was 73%. Herein, structured quantitative questionnaire has been used to collect the data (Appendix 1). The

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collected data has been analysed using SPSS 21.0. Descriptive analysis has been conducted here using frequency, mean and standard deviation.

### III. RESULTS AND DISCUSSION

The demographic profile of the respondents has been presented as below-

		Frequency	Percent
<b>Gender</b>	<b>Male</b>	17	27.4
	<b>Female</b>	45	72.6
<b>Age</b>	<b>20-25</b>	2	3.2
	<b>25-30</b>	4	6.5
	<b>30-35</b>	4	6.5
	<b>35-40</b>	14	22.6
	<b>40-45</b>	18	29.0
	<b>45-50</b>	13	21.0
	<b>50-55</b>	4	6.5
	<b>55-60</b>	2	3.2
	<b>60 and Above</b>	1	1.6
<b>Tenure</b>	<b>6months-2 Years</b>	2	3.2
	<b>2-5 Years</b>	3	4.8
	<b>5-7 Years</b>	7	11.3
	<b>7-10 Years</b>	4	6.5
	<b>10-13 Years</b>	11	17.7
	<b>13-15 Years</b>	19	30.6
	<b>15 and above</b>	16	25.8

Table 1: Demographic Profile of Respondents

It can be inferred from Table 1 that the number of female respondents (72.6%) are more than the male respondents (27.4%). Thus, it can be stated that the number of female nurses are more than the male nurses. In a study conducted by Marañón et al., (2019), it has been stated that the number of female nurses outnumber the male nurses in the hospital industry. Thus, this study is in sync with the findings of the present research.

Also, maximum respondents (29%) belong to the age group of 40-45 while maximum respondents (30.6%) have tenure of 13-15 years in hospital industry.

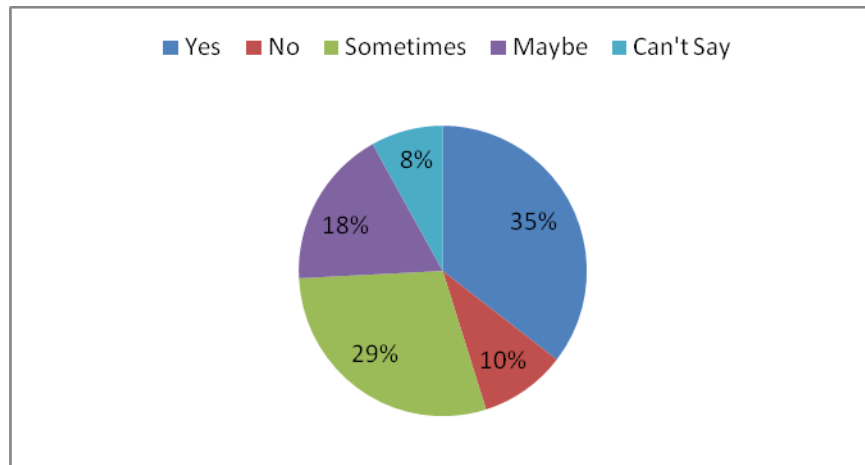


Figure 1: Errors that occur in hospitals have adverse impact on patient health and care

When asked in it the errors that occur in hospitals have adverse impact on patient health and care, 35% of the respondents agreed to it while 29% stated sometimes (Figure 1). This means that though nurses are not openly agreeing to it but are definitely not opposing it. Only 10% of the nurses disagreed that errors that occur in hospitals have adverse impact on patient health. Thus, it can be sated that errors that occur in hospitals do have some level of adverse impact on patient health and care. In a research conducted by Rodziewicz; et al., (2020) it has been stated that errors occurring in hospitals have a significantly negative impact on the health of the patients thereby supporting the findings of the present research.

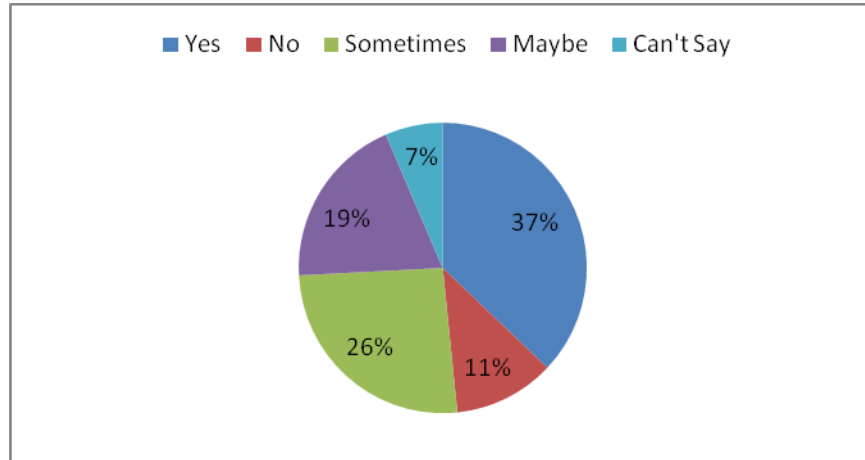


Figure 2: Errors occurring in hospitals are avoidable

When asked if errors occurring in hospitals are avoidable, 37% of the respondents agreed to it while 26% stated sometimes (Figure 2). This it can be stated that errors occurring in hospitals are avoidable since maximum number of respondents are agreeing to it.

		SA	A	N	D	SD	Mean	Std. Deviation
C1	Number	11	15	28	6	2	2.56	1.002
	Percent	17.7	24.2	45.2	9.7	3.2		
C2	Number	12	16	25	6	3	2.55	1.066
	Percent	19.4	25.8	40.3	9.7	4.8		
C3	Number	23	21	9	6	3	2.11	1.161
	Percent	37.1	33.9	14.5	9.7	4.8		
C4	Number	19	23	16	3	1	2.10	.953
	Percent	30.6	37.1	25.8	4.8	1.6		
C5	Number	16	24	11	8	3	2.32	1.142
	Percent	25.8	38.7	17.7	12.9	4.8		
C6	Number	22	19	16	3	2	2.10	1.051
	Percent	35.5	30.6	25.8	4.8	3.2		
C7	Number	17	25	10	5	5	2.29	1.193
	Percent	27.4	40.3	16.1	8.1	8.1		
C8	Number	13	17	24	5	3	2.48	1.067
	Percent	21.0	27.4	38.7	8.1	4.8		
GT	Number	133	160	139	42	22	19	9

[SA= strongly agree, A= Agree, N= Neutral, D= Disagree, SD= Strongly Disagree, MV= mean value, GT= grand total]

Table 2: Summary of Reasons Behind as To Why Hospitals Have till Now Have Not Implemented Poke Yoke

It can be inferred from the Table-2 that 71% (23 respondents strongly agreed while 21 agreed) of the respondents support the statement C3 (Appendix 1) and thus it can be stated that if the proper training is provided to the staff and nurses, implementation of Poka-Yoke can be improved. In a research conducted by Khorasani et al., (2018) on impact of Poka-Yoke on medication errors in hospitals, it was found that training of staff on Poka-Yoke techniques can significantly have positive impact on the implementation. Thus, this study is in sync with the findings of the present research.

Further, small values of standard deviation show that the spread of responses by the respondents is not very widespread. This means that almost all the respondents responded close to the mean value and thus their responses do not vary much.

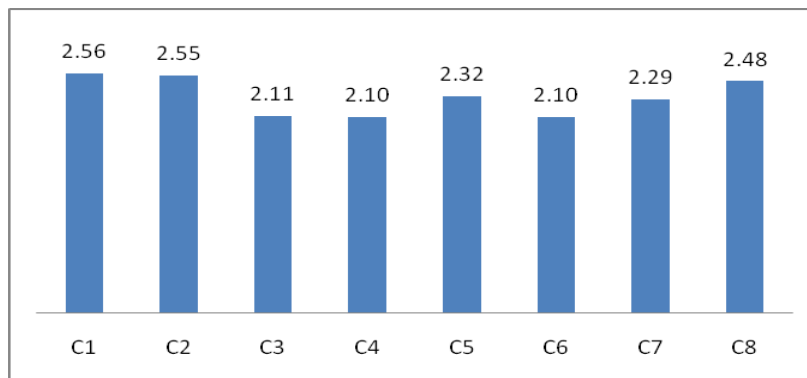


Figure 3: Mean distribution of Reasons Behind as To Why Hospitals Have Till Now Have Not Implemented Poke Yoke

It can be inferred from Figure 3 that mean value of statements C4 and C6 (mean-2.10) is closest to agreement (1= strongly agree, 2= agree, 3=neutral, 4= disagree, 5= strongly disagree). Thus, it can be stated that time requirement and investment requirement are the major reasons for hospitals lacking in implementation of Poke-Yoke. Next in line is statement C3 with mean value (2.11) close enough to agreement (1= strongly agree, 2= agree, 3=neutral, 4= disagree, 5= strongly disagree).

		SA	A	N	D	SD	Mean	Std. Deviation
<b>D1</b>	<b>Number</b>	15	28	11	6	2	2.225806	1.030985
	<b>Percent</b>	24.2	45.2	17.7	9.7	3.2		
<b>D2</b>	<b>Number</b>	16	25	12	6	3	2.274194	1.103933
	<b>Percent</b>	25.8	40.3	19.4	9.7	4.8		
<b>D3</b>	<b>Number</b>	11	15	23	8	5	2.693548	1.153593
	<b>Percent</b>	17.7	24.2	37.1	12.9	8.1		
<b>D4</b>	<b>Number</b>	5	8	11	21	17	3.596774	1.247419
	<b>Percent</b>	8.1	12.9	17.7	33.9	27.4		
<b>D5</b>	<b>Number</b>	17	23	12	7	3	2.290323	1.136389
	<b>Percent</b>	27.4	37.1	19.4	11.3	4.8		
<b>D6</b>	<b>Number</b>	21	18	14	5	4	2.241935	1.196792
	<b>Percent</b>	33.9	29.0	22.6	8.1	6.5		
<b>D7</b>	<b>Number</b>	10	14	25	9	4	2.725806	1.103933
	<b>Percent</b>	16.1	22.6	40.3	14.5	6.5		
<b>D8</b>	<b>Number</b>	4	7	12	22	17	3.66129	1.186586
	<b>Percent</b>	6.5	11.3	19.4	35.5	27.4		
<b>D9</b>	<b>Number</b>	17	24	13	4	4	2.258065	1.129855
	<b>Percent</b>	27.4	38.7	21.0	6.5	6.5		
<b>GT</b>	<b>Number</b>	116	162	133	88	59	23.96774	10.28948

[SA= strongly agree, A= Agree, N= Neutral, D= Disagree, SD= Strongly Disagree, MV= mean value, GT= grand total]

Table 3: Summary of Aspects Which Require Implementation of Poka Yoke In Hospitals

It can be inferred from the Table 3 that 69.4% (15 respondents strongly agreed while 28 agreed) of the respondents support the statement D1 (Appendix 1) and thus it can be stated that out of all the issues, data entry requires the most the implementation of Poka-Yoke to error proof it. Next 66.1% (16 respondents strongly agreed while 25 agreed) of the respondents support the statement D2 (Appendix 1). Thus, it can be stated that out of all the issues, communication is a segment that requires implementation of Poka-Yoke to error proof it. In a research conducted by Raman & Dubey, (2019), communication was found to be one error that exists in hospitals which requires solution for error proofing which can be addressed via Poka-Yoke. Thus, this study is in sync with the findings of the present research.

Further, small values of standard deviation show that the spread of responses by the respondents is not very widespread. This means that almost all the respondents responded close to the mean value and thus their responses do not vary much.

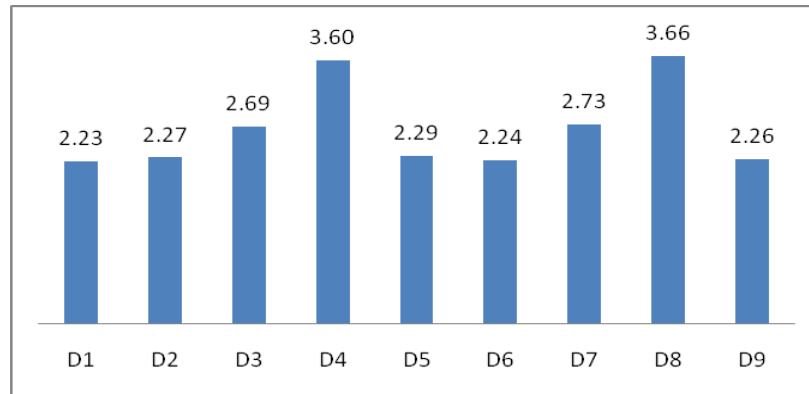


Figure 4: Mean Distribution of Aspects Which Require Implementation of Poka Yoke in Hospitals

It can be inferred from Figure 4 that mean value of statements D1 (mean- 2.23) is closest to agreement (1= strongly agree, 2= agree, 3=neutral, 4= disagree, 5= strongly disagree). Thus, it can be stated data entry requires the most the implementation of Poka Yoke to error proof it. Next in line is statement D9 with mean value (2.26) close enough to agreement (1= strongly agree, 2= agree, 3=neutral, 4= disagree, 5= strongly disagree). Thus, it can be stated that since the staff is not following the procedures which then requires the implementation of Poka-Yoke in hospitals.

#### IV. CONCLUSION

The present research found that that if the proper training is provided to the staff and nurses, implementation of Poka-Yoke can be improved. The study found that time requirement and investment requirement are the major reasons for hospitals lacking in implementation of Poke-Yoke. Further, the study found data entry to be the aspect that requires the most the implementation of Poka-Yoke to error proof it. Communication is another segment that requires implementation of Poka-Yoke to error proof it. Finally, it was found that since the staffs are not following the procedures, it requires the implementation of Poka-Yoke in hospitals when compared with other aspects of errors.

The present research has some limitations. Since the present research is based on the perception of nurses, the overall picture of scenario has not been covered thereby limiting the scope of the research. For future study, a comparative analysis can be conducted between two cities or states so as to understand the one with better performance for implementation of Poka-Yoke.

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