Title: Analysis of Utilization Rate of WHO Surgical Safety Checklist

Introduction: The purpose of this analysis is to study the utilization rate of the WHO surgical safety checklist across different levels of checklist usage. The data consists of the count and percentage of utilization for each level of checklist usage: Not used, partially used, and completely used.

Data:

The data used for this analysis is as follows:

Use of WHO checklist	n=136	Percent
Not used	7	5.2
Partially used	45	33.3
Completely used	83	61.5

Hypothesis:

- Null Hypothesis (H0): There is no significant association between the utilization of the WHO surgical safety checklist and the level of checklist usage.
- Alternative Hypothesis (H1): There is a significant association between the utilization of the WHO surgical safety checklist and the level of checklist usage.

Analysis:

- We will perform a chi-squared test to determine whether there is a significant association between the utilization of the WHO surgical safety checklist and the level of checklist usage.

Results:

- Chi-square Statistic: 64.18
- P-value: < 0.001 (1.16e-14)

Interpretation:

- The chi-square test results reveal a significant association between the utilization of the WHO surgical safety checklist and the level of checklist usage (Chi-square = 64.18, $p < 0.001$). Thus, we **reject the null hypothesis**, suggesting that the level of checklist usage is indeed related to the utilization rate. Further investigation may be warranted to understand the nature of this association, potentially involving qualitative research or detailed analysis of specific checklist items.

Conclusion:

- Based on the chi-squared test results, we reject the null hypothesis of independence between checklist usage and utilization rate (Chi-square = 64.18, $p < 0.001$). Therefore, we conclude that there is a statistically significant association between the utilization of the WHO surgical safety checklist and the level of checklist usage.

Introduction:

The purpose of this analysis is to study and compare the utilization rate of the three components of the WHO surgical safety checklist: Section I, Section II, and Section III. The data consists of the count and percentage of utilization for each checklist section.

Data:

The data used for this analysis is as follows:

Section	n=45	Percent
I	0	
II	1	2.2
III	13	28.9

Hypothesis:

- Null Hypothesis (H0): There is no significant association between the utilization of the three components of the WHO surgical safety checklist.
- Alternative Hypothesis (H1): There is a significant association between the utilization of the three components of the WHO surgical safety checklist.

Analysis:

- We will perform a chi-squared test to determine whether there is a significant association between the utilization of the three components of the WHO surgical safety checklist.

Results:

The chi-squared test results are as follows:

- Chi-square Statistic: 22.43
- P-value: < 0.001 (1.35e-05)

Interpretation:

- The chi-squared test reveals a significant association between the utilization of the three components of the WHO surgical safety checklist (Chi-square = 22.43, $p < 0.001$). Consequently, we **reject the null hypothesis,** indicating that there is a statistically significant relationship between the utilization of these checklist components. Further investigation may be warranted to

understand the nature of this association, potentially involving qualitative research or detailed analysis of specific checklist items.

Conclusion:

- Based on the chi-squared test results (Chi-square = 22.43, $p < 0.001$), we reject the null hypothesis of independence between checklist components and utilization rate. Therefore, we conclude that there is a statistically significant association between the utilization of the three components of the WHO surgical safety checklist.

Introduction:

The purpose of this analysis is to study and compare the utilization rate of the three components of the WHO surgical safety checklist: Section I, Section II, and Section III. The data consists of the count and percentage of utilization for each checklist section.

Data:

The data used for this analysis is as follows:

To compare the difference in utilization of the checklist between elective and emergency procedures

Use of WHO checklist	Elective (n=103)	%	Emergency (n=32)	%
Not used	5	4.9	2	6.3
Partially used	34	62.1	11	59.4
Completely used	64	33.0	19	34.4

Hypothesis:

- Null Hypothesis (H0): There is no significant association between the utilization of the three components of the WHO surgical safety checklist and the type of procedure (elective or emergency).
- Alternative Hypothesis (H1): There is a significant association between the utilization of the three components of the WHO surgical safety checklist and the type of procedure (elective or emergency).

Analysis:

We performed a chi-squared test to determine whether there is a significant association between the utilization of the three components of the WHO surgical safety checklist.

Results:

The chi-squared test results are as follows:

- Chi-square Statistic: 0.136

- P-value: 0.934

Interpretation:

- The chi-squared test yielded a p-value of 0.934, indicating that there is no statistically significant association between the utilization of the three components of the WHO surgical safety checklist and the type of procedure (elective or emergency). Thus, we **fail to reject the null hypothesis**.

Conclusion:

- Considering the lack of statistical significance revealed by the chi-squared test (Chi-square = 0.136, p = 0.934), we conclude that there is no substantial evidence to suggest an association between the utilization of the three checklist components and the type of procedure (elective or emergency).

Introduction:

The purpose of this analysis is to study and compare the utilization rate of the three components of the WHO surgical safety checklist: Section I, Section II, and Section III. The data consists of the count and percentage of utilization for each checklist section.

Data:

The data used for this analysis is as follows:

Specialty	Not Used	%	Used Partially	%	Used Completely	%	Total
Burn Surgery Elective	3	4.7	23	35.9	38	59.4	64
Burn Surgery Emergency	1	6.7	8	53.3	6	40	15
General Elective	1	8.3	6	50	5	41.7	12
General Emergency			1	100			1
Hand Surgery Elective			2	18.2	9	81.8	11
Hand Surgery Emergency	1	6.7	1	6.7	13	86.7	15
Cleft Elective	1	6.3	3	18.8	12	75	16
Cleft Emergency			1	100			1

Hypothesis:

- Null Hypothesis (H0): There is no significant association between the utilization of the three components of the WHO surgical safety checklist and the specialties as well as procedure types.
- Alternative Hypothesis (H1): There is a significant association between the utilization of the three components of the WHO surgical safety checklist and the specialties as well as procedure types.

Analysis:

- We performed a chi-squared test to determine whether there is a significant association between the utilization of the three components of the WHO surgical safety checklist.

Results:

The chi-squared test results are as follows:

- Chi-square Statistic: 1007.84
- P-value: < 0.001 (6.62e-189)

Interpretation:

- The chi-squared test yielded a p-value of < 0.001, indicating a highly significant association between the utilization of the three components of the WHO surgical safety checklist and the specialties as well as procedure types. Therefore, we **reject the null hypothesis**.

Conclusion:

- Given the strong evidence provided by the chi-squared test results (Chi-square = 1007.84, p < 0.001), we conclude that there is a statistically significant association between the utilization of the three components of the WHO surgical safety checklist and the specialties as well as procedure types. Further exploration may be warranted to understand the underlying factors contributing to this association across different specialties and procedure contexts.

Introduction:

The purpose of this analysis is to study the association between participant type and familiarity level with the WHO surgical safety checklist. The data consists of the count of participants classified into three familiarity levels (Very Familiar, Familiar, Somewhat Familiar) across different participant types.

Data:

The data used for this analysis is as follows:

To study the familiarity with checklist use between the various participant types:

	Very Familiar with the checklist	**Familiar with checklist**	**somewhat familiar with the checklist**	**unfamiliar with checklist**	**Very Unfamiliar**
Nurse(Total 3)	1	1	1		
Nursing lead(Total 2)	1	1			
Resident and fellows(Total 3)	2		1		
Surgeon hand(2)	1	1			
Surgeon cleft(2)	2				
Surgeon	3				

plastics(Total 3)					
departmental head(total 2)	2				
Anesthesiologists(total 2)	2				

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant type and familiarity level with the WHO surgical safety checklist.
- Alternative Hypothesis (H1): There is a significant association between participant type and familiarity level with the WHO surgical safety checklist.

Analysis:

We performed a chi-squared test to determine whether there is a significant association between participant type and familiarity level with the WHO surgical safety checklist.

Results:

The chi-squared test results are as follows:

- Chi-square Statistic: 11.61
- P-value: 0.638

Interpretation:

- The chi-squared test yielded a p-value of 0.638, indicating no statistically significant association between participant type and familiarity level with the WHO surgical safety checklist. Thus, we **fail to reject the null hypothesis**.

Conclusion:

- Given the non-significant findings from the chi-squared test (Chi-square = 11.61, p = 0.638), we conclude that there is no substantial evidence to suggest an association between participant type and familiarity level with the WHO surgical safety checklist. Further investigation may be warranted to confirm this finding and explore potential factors influencing familiarity levels among different participant types.

Introduction:

The permutation test was conducted to investigate the association between participant groups and their training statuses. The purpose of this analysis was to determine whether there is a significant relationship between participant groups and their training statuses.

Data:

The provided data consisted of participant groups categorized into three types of training statuses: "Training Yes," "Training No," and "Training No but on Job." The table below summarizes the distribution of individuals in each participant group based on their training status:

	training yes	training no	training no but on job
Nurse(Total 3)		2	1
Nursing lead(Total 2)		2	
Resident and fellows(Total 3)		3	
Surgeon hand(2)		2	
Surgeon cleft(2)	1	1	
Surgeon plastics(Total 3)	1	2	
departmental head(total 2)		2	
Anaesthesiologists(total 2)		1	1

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and their training statuses.
- Alternative Hypothesis (H1): There is a significant association between participant groups and their training statuses.

Analysis:

- A permutation test was performed to assess the relationship between participant groups and their training statuses. The permutation test evaluates whether there is a significant association between categorical variables by permuting the labels and computing the test statistic for each permutation.

Result:

The permutation test yielded the following result:

- P-value: 1.0

Interpretation:

- The p-value obtained from the permutation test was 1.0, indicating that there is a high probability of observing the test statistic under the null hypothesis. This suggests that the observed association between participant groups and their training statuses could have occurred by random chance alone. Therefore, there is **insufficient evidence to reject the null hypothesis**.

Conclusion:

- Based on the interpretation of the permutation test results, we fail to reject the null hypothesis. Thus, we conclude that there is insufficient evidence to support the existence of a significant association between participant groups and their training statuses. Further investigation may be warranted to validate these findings and explore other potential factors influencing training statuses among different participant groups.

Introduction:

The objective of this analysis is to assess the association between participant groups and their training habits using a permutation test. This test aims to determine whether there is a significant relationship between the type of participant group and the frequency of training habit utilization.

Data:

- Participant Groups: Nurse, Nursing Lead, Resident and Fellows, Surgeon Hand, Surgeon Cleft, Surgeon Plastics, Departmental Head, Anesthesiologists.
- Training Habits: Never use the checklist, Rarely use the checklist, Sometimes use the checklist, Often use the checklist, Always use the checklist.

	Never use checklist	**Rarely use checklist**	**Sometimes uses checklist**	**often uses checklist**	**Always uses checklist**
Nurse(Total 3)				2	1
Nursing lead(Total 2)					2
Resident and fellows(Total 3)		1	1		1
Surgeon hand(2)			1	1	
Surgeon cleft(2)					2
Surgeon plastics(Total 3)			1	2	
departmental head(total 2)				1	1
Anaesthesiologists(total 2)					2

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and their training habits.
- Alternative Hypothesis (H1): There is a significant association between participant groups and their training habits.

Permutation Test Result:

- P-value: 0.0435

Interpretation:

- The p-value of 0.0435 suggests that if there were truly no association between participant groups and their training habits, there would be a 4.35% chance of observing a test statistic as extreme as, or more extreme than, the one calculated from the actual data.
- Since this probability is below the chosen significance level of 0.05, we **reject the null hypothesis** and accept the alternative hypothesis, indicating a significant association between participant groups and their training habits.

Conclusion:

- The permutation test yielded a p-value of 0.0435.
- With a significance level of 0.05, we reject the null hypothesis.

- Therefore, we conclude that there is a significant association between participant groups and their training habits.
- Further investigation may be necessary to explore the nature and implications of the observed association between participant groups and their training habits.

Introduction:

The objective of this analysis is to assess the association between participant groups and their training habits using a permutation test. This test aims to determine whether there is a significant relationship between the type of participant group and the frequency of training habit utilization.

Data:

- Participant Groups: Nurse, Nursing Lead, Resident and Fellows, Surgeon Hand, Surgeon Cleft, Surgeon Plastics, Departmental Head, Anesthesiologists.
- Training Habits: Never use the checklist, Rarely use the checklist, Sometimes use the checklist, Often use the checklist, Always use the checklist.

	checklist very important	**feels checklist is important**	**feels checklist is neutral**	**feels checklist is unimportant**	**feels checklist is very unimportant**
Nurse(Total 3)	1	2			
Nursing lead(Total 2)	2				
Resident and fellows(Total 3)	3				
Surgeon hand(2)	1	1			
Surgeon cleft(2)	2				
Surgeon plastics(Total 3)	1	2			
Departmental head(Total 2)	2				
Anesthesiologists(Total 2)	2				

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and their training habits.
- Alternative Hypothesis (H1): There is a significant association between participant groups and their training habits.

Permutation Test Results:

- P-value: 9.999000099990002e-05

Interpretation:

- The p-value of 9.999000099990002e-05 suggests that if there were truly no association between participant groups and their training habits, there would be a very small chance of observing a test statistic as extreme as, or more extreme than, the one calculated from the actual data. Since this

probability is below the chosen significance level of 0.05, we reject the null hypothesis and accept the alternative hypothesis, indicating a significant association between participant groups and their training habits.

Conclusion:

- The permutation test yielded a p-value of 9.999000099990002e-05. With a significance level of 0.05, we **reject the null hypothesis**. Therefore, we conclude that there is a significant association between participant groups and their training habits.

Introduction:

The objective of this analysis is to assess the association between participant groups and their training habits using a permutation test. This test aims to determine whether there is a significant relationship between the type of participant group and the perceived difficulty level of using a checklist.

Data:

- Participant Groups: Nurse, Nursing Lead, Resident and Fellows, Surgeon Hand, Surgeon Cleft, Surgeon Plastics, Departmental Head, Anesthesiologists
- Training Habits: Very easy to use checklist, Easy to use checklist, Neutral, Hard to very hard to use checklist, Very hard to use checklist.

	very easy to use checklist	easy to use checklist	neutral	hard very hard to use checklist	very hard to use checklist
Nurse(Total 3)		3			
Nursing lead(Total 2)	1		1		
Resident and fellows(Total 3)			3		
Surgeon hand(2)		1	1		
Surgeon cleft(2)	1		1		
Surgeon plastics(Total 3)		1	2		
departmental head(total 2)	1		1		
Anesthesiologists(total 2)		2			

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and the perceived difficulty level of using a checklist.
- Alternative Hypothesis (H1): There is a significant association between participant groups and the perceived difficulty level of using a checklist.

Permutation Test Results:

- P-value: 9.999000099990002e-05

Interpretation:

- The p-value of 9.999000099990002e-05 suggests that if there were truly no association between participant groups and the perceived difficulty level of using a checklist, there would be a very small chance of observing a test statistic as extreme as, or more extreme than, the one calculated from the actual data. Since this probability is below the chosen significance level of 0.05, we **reject the null hypothesis** and accept the alternative hypothesis, indicating a significant association between participant groups and the perceived difficulty level of using a checklist.

Conclusion:

- The permutation test yielded a p-value of 9.999000099990002e-05. With a significance level of 0.05, we reject the null hypothesis. Therefore, we conclude that there is a significant association between participant groups and the perceived difficulty level of using a checklist.

Introduction:

The objective of this analysis is to assess the association between participant groups and their training habits using a permutation test. This test aims to determine whether there is a significant relationship between the type of participant group and the perceived level of leadership support.

Data:

- Participant Groups**:** Nurse, Nursing Lead, Resident and Fellows, Surgeon Hand, Surgeon Cleft, Surgeon Plastics, Departmental Head, Anesthesiologists
- Training Habits: Leadership is very supportive, Leadership is supportive, Neutral, Leadership is unsupportive, Leadership is very unsupportive.

	leadership is very supportive	**leadership is supportive**	**Neutral**	**leadership is unsupportive**	**leadership is very unsupportive**
Nurse(Total 3)		2	1		
Nursing lead(Total 2)	1	1			
Resident and fellows(Total 3)		2	1		
Surgeon hand(2)		2			
Surgeon cleft(2)	2				
Surgeon plastics(Total 3)		2		1	
departmental head(total 2)	1		1		
Anaesthesiologists(total 2)	1	1			

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and the perceived level of leadership support.
- Alternative Hypothesis (H1): There is a significant association between participant groups and the perceived level of leadership support.

Permutation Test Results:

- P-value: 0.7908209179082092

Interpretation:

- The p-value of 0.7908209179082092 suggests that there is a high probability of observing a test statistic as extreme as, or more extreme than, the one calculated from the actual data, even if there were truly no association between participant groups and the perceived level of leadership support. Since this probability is above the chosen significance level of 0.05, we **fail to reject the null hypothesis**, indicating that there is no significant association between participant groups and the perceived level of leadership support.

Conclusion:

- The permutation test yielded a p-value of 0.7908209179082092. With a significance level of 0.05, we fail to reject the null hypothesis. Therefore, we conclude that there is no significant association between participant groups and the perceived level of leadership support.

Introduction:

The objective of this analysis is to assess the association between participant groups and their satisfaction levels with using a particular tool or service, using a permutation test. This test aims to determine whether there is a significant relationship between the type of participant group and their satisfaction levels.

Data:

- Participant Groups: Nurse, Nursing Lead, Resident and Fellows, Surgeon Hand, Surgeon Cleft, Surgeon Plastics, Departmental Head, Anesthesiologists
- Satisfaction Levels: Very satisfied with use, Satisfied with use, Unsure about use, Unsatisfied with use, Very unsatisfied.

	Very satisfied with use	**satisfied with use**	**unsure about use**	**unsatisfied with use**	**very unsatisfied**
Nurse(Total 3)		2		1	
Nursing lead(Total 2)		1	1		
Resident and fellows(Total 3)			2		1
Surgeon hand(2)		1	1		
Surgeon cleft(2)		1		1	
Surgeon plastics(Total 3)		1		2	

departmental head(total 2)		1		1	
Anaesthesiologists(total 2)		2			

Hypothesis:

- Null Hypothesis (H0): There is no significant association between participant groups and their satisfaction levels with using the tool or service.
- Alternative Hypothesis (H1): There is a significant association between participant groups and their satisfaction levels with using the tool or service.

Permutation Test Results:

- P-value: 0.030396960303969604

Interpretation:

- The p-value of 0.030396960303969604 suggests that there is a low probability of observing a test statistic as extreme as, or more extreme than, the one calculated from the actual data, assuming the null hypothesis is true. Since this probability is below the chosen significance level of 0.05, we **reject the null hypothesis** and accept the alternative hypothesis, indicating a significant association between participant groups and their satisfaction levels with using the tool or service.

Conclusion:

- The permutation test yielded a p-value of 0.030396960303969604. With a significance level of 0.05, we reject the null hypothesis. Therefore, we conclude that there is a significant association between participant groups and their satisfaction levels with using the tool or service.