توحید

Pain killer Dua دعاء للالم

اعوذ بعزۃ اللہ وقدرتہ وسلطانہ من شر مآ آجد 7 مرۃ

move your right hand on pain spot 7 times

ARTICLERESEARCH CHART INFO GRAPHIC OF Prepositions(حـــروف جر) (USAGE &EXAMPLES)

ARTICLE/RESEARCH: CHART / INFO GRAPHIC OF Prepositions(حـــــروف جر) (USAGE &EXAMPLES)

Prepositions – Time

English	Usage	Example
. on	§ days of the week	§ on Monday

English	Usage	Example
· in	§ months / seasons § time of day § year § after a certain period of time *(when?)*	§ in August / in winter § in the morning § in 2006 § in an hour
· at	§ for *night* § for *weekend* § a certain point of time *(when?)*	§ at night § at the weekend § at half past nine
· since	§ from a certain point of time (past till now)	§ since 1980
· for	§ over a certain period of time (past till now)	§ for 2 years
· ago	§ a certain time in the past	§ 2 years ago
· before	§ earlier than a certain point of time	§ before 2004
· to	§ telling the time	§ ten to six (5:50)
· past	§ telling the time	§ ten past six (6:10)
· to / till / until	§ marking the beginning and end of a period of time	§ from Monday to/till Friday
· till / until	§ in the sense of *how long something is going to last*	§ He is on holiday until Friday.
· by	§ in the sense of *at the latest* § up to a certain time	§ I will be back by 6 o'clock. § By 11 o'clock, I had read five pages.

Prepositions – Place (Position and Direction)

English	Usage	Example
· in	§ room, building, street, town, country § book, paper etc. § car, taxi § picture, world	§ in the kitchen, in London § in the book § in the car, in a taxi § in the picture, in the world
· at	§ meaning *next to, by an object* § for *table* § for events § place where you are to do something typical (watch a film, study, work)	§ at the door, at the station § at the table § at a concert, at the party § at the cinema, at school, at work
· on	§ attached § for a place with a river § being on a surface § for a certain side (left, right) § for a floor in a house § for public transport § for *television, radio*	§ the picture on the wall § London lies on the Thames. § on the table § on the left § on the first floor § on the bus, on a plane § on TV, on the radio
· by, next to, beside	§ left or right of somebody or something	§ Jane is standing by / next to / beside the car.
· under	§ on the ground, lower than (or covered by) something else	§ the bag is under the table
· below	§ lower than something else but above ground	§ the fish are below the surface
· over	§ covered by something else § meaning *more than* § getting to the other side (also *across*) § overcoming an obstacle	§ put a jacket over your shirt § over 16 years of age § walk over the bridge § climb over the wall
· above	§ higher than something else, but not directly over it	§ a path above the lake
· across	§ getting to the other side (also *over*) § getting to the other side	§ walk across the bridge § swim across the lake
· through	§ something with limits on top, bottom and the sides	§ drive through the tunnel

English	Usage	Example
· to	§ movement to person or building § movement to a place or country § for *bed*	§ go to the cinema § go to London / Ireland § go to bed
· into	§ enter a room / a building	§ go into the kitchen / the house
· towards	§ movement in the direction of something (but not directly to it)	§ go 5 steps towards the house
· onto	§ movement to the top of something	§ jump onto the table
· from	§ in the sense of *where from*	§ a flower from the garden

Other important Prepositions

English	Usage	Example
· from	§ who gave it	§ a present from Jane
· of	§ who/what does it belong to § what does it show	§ a page of the book § the picture of a palace
· by	§ who made it	§ a book by Mark Twain
· on	§ walking or riding on horseback § entering a public transport vehicle	§ on foot, on horseback § get on the bus
· in	§ entering a car / Taxi	§ get in the car
· off	§ leaving a public transport vehicle	§ get off the train
· out of	§ leaving a car / Taxi	§ get out of the taxi
· by	§ rise or fall of something § travelling (other than walking or horse riding)	§ prices have risen by 10 percent § by car, by bus

English	Usage	Example
· at	§ for *age*	§ she learned Russian at 45
· about	§ for topics, meaning *what about*	§ we were talking about you

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ARTICLE/ RESEARCH ON SCIENCE: LIST OF MICROORGANISMS USED IN FOOD & BEVERAGE

LIST OF MICROORGANISMS USED IN FOOD & BEVERAGE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
1. *SACCHAROMYCES CEREVISIAE*	fungus	ALE BEER
2. *ASPERGILLUS NIGER*	fungus	AWAMORI
3. *BRACHYBACTERIUM ALIMENTARIUM*	bacterium	BEAUFORT CHEESE
4. *BRACHYBACTERIUM TYROFERMENTANS*	bacterium	BEAUFORT CHEESE
5. *ACETOBACTER CEREVISIAE*	bacterium	BEER
6. *SACCHAROMYCES BAYANUS*	fungus	BEER
7. *LACTOBACILLUS BUCHERI*	bacterium	BREAD
8. *LACTOBACILLUS JENSENII*	bacterium	BREAD
9. *SACCHAROMYCES CEREVISIAE*	fungus	BREAD
10. *LACTOBACILLUS SPP.*	bacterium	BUTTER
11. *LACTOCOCCUS SPP.*	bacterium	BUTTER
12. *LEUCONOSTOC MESENTEROIDES SSP. DEXTRANICUM*	bacterium	BUTTER
13. *LEUCONOSTOC PSEUDOMESENTEROIDES*	bacterium	BUTTER
14. *LEUCONOSTOC SPP.*	bacterium	BUTTER
15. *LACTOCOCCUS LACTIS*	bacterium	BUTTERMILK
16. *LEUCONOSTOC PSEUDOMESENTEROIDES*	bacterium	BUTTERMILK
17. *LACTOBACILLUS CURVATUS*	bacterium	CACIO DI FOSSA CHEESE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
18. *LACTOBACILLUS PARACASEI SSP. PARACASEI*	bacterium	CACIO DI FOSSA CHEESE
19. *LACTOBACILLUS PLANTARUM*	bacterium	CACIO DI FOSSA CHEESE
20. *LACTOBACILLUS BREVIS*	bacterium	CANESTRATO PUGLIESE CHEESE
21. *LACTOBACILLUS CURVATUS*	bacterium	CANESTRATO PUGLIESE CHEESE
22. *LACTOBACILLUS PARACASEI SSP. PARACASEI*	bacterium	CANESTRATO PUGLIESE CHEESE
23. *LACTOBACILLUS PENTOSUS*	bacterium	CANESTRATO PUGLIESE CHEESE
24. *LACTOBACILLUS PLANTARUM*	bacterium	CANESTRATO PUGLIESE CHEESE
25. *LACTOBACILLUS MANIHOTIVORANS*	bacterium	CASSAVA
26. *WEISSELLA BENINENSIS*	bacterium	CASSAVA
27. *LACTOCOCCUS LACTIS SSP. CREMORIS*	bacterium	CHEDDAR CHEESE
28. *BREVIBACTERIUM AURANTIACUM*	bacterium	CHEESE
29. *CANDIDA COLLICULOSA*	fungus	CHEESE
30. *CANDIDA UTILIS*	fungus	CHEESE
31. *CARNOBACTERIUM DIVERGENS*	bacterium	CHEESE
32. *CORYNEBACTERIUM AMMONIAGENES*	bacterium	CHEESE
33. *CORYNEBACTERIUM FLAVESCENS*	bacterium	CHEESE
34. *CORYNEBACTERIUM VARIABILE*	bacterium	CHEESE
35. *CYSTOFILOBASIDIUM INFIRMOMINIATUM*	fungus	CHEESE
36. *ENTEROCOCCUS FAECALIS*	bacterium	CHEESE
37. *FUSARIUM DOMESTICUM*	fungus	CHEESE
38. *GEOTRICHUM CANDIDUM*	fungus	CHEESE
39. *HAFNIA ALVEI*	bacterium	CHEESE
40. *KLUYVEROMYCES LACTIS*	fungus	CHEESE
41. *KLUYVEROMYCES MARXIANUS*	fungus	CHEESE
42. *KOCURIA RHIZOPHILA*	bacterium	CHEESE
43. *LACTOBACILLUS CORYNIFORMIS*	bacterium	CHEESE
44. *LACTOBACILLUS DELBRUECKII SSP. BULGARICUS*	bacterium	CHEESE
45. *LACTOBACILLUS HELVETICUS*	bacterium	CHEESE
46. *LACTOBACILLUS PARABREVIS*	bacterium	CHEESE
47. *LACTOBACILLUS PARAPLANTARUM*	bacterium	CHEESE
48. *LACTOBACILLUS PEROLENS*	bacterium	CHEESE
49. *LACTOCOCCUS LACTIS SSP. LACTIS*	bacterium	CHEESE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
50. *LACTOCOCCUS RAFFINOLACTIS*	bacterium	CHEESE
51. *LECANICILLIUM LECANII*	fungus	CHEESE
52. *LEUCONOSTOC CITREUM*	bacterium	CHEESE
53. *LEUCONOSTOC LACTIS*	bacterium	CHEESE
54. *LEUCONOSTOC MESENTEROIDES* SSP. *CREMORIS*	bacterium	CHEESE
55. *MACROCOCCUS CASEOLYTICUS*	bacterium	CHEESE
56. *MICROCOCCUS LUTEUS*	bacterium	CHEESE
57. *MUCOR PLUMBEUS*	fungus	CHEESE
58. *MUCOR RACEMOSUS*	fungus	CHEESE
59. *PENICILLIUM CAMEMBERTI*	fungus	CHEESE
60. *PENICILLIUM CASEIFULVUM*	fungus	CHEESE
61. *PENICILLIUM CHRYSOGENUM*	fungus	CHEESE
62. *PENICILLIUM NALGIOVENSE*	fungus	CHEESE
63. *PENICILLIUM ROQUEFORTI*	fungus	CHEESE
64. *PROPIONIBACTERIUM ACIDIPROPIONICI*	bacterium	CHEESE
65. *PROPIONIBACTERIUM JENSENII*	bacterium	CHEESE
66. *PROPIONIBACTERIUM THOENII*	bacterium	CHEESE
67. *PSYCHROBACTER CELER*	bacterium	CHEESE
68. *RHODOSPORIDIUM INFIRMOMINIATUM*	fungus	CHEESE
69. *SACCHAROMYCES CEREVISIAE*	fungus	CHEESE
70. *STAPHYLOCOCCUS CARNOSUS*	bacterium	CHEESE
71. *STAPHYLOCOCCUS EQUORUM* SSP. *LINENS*	bacterium	CHEESE
72. *STAPHYLOCOCCUS FLEURETTII*	bacterium	CHEESE
73. *STAPHYLOCOCCUS SCIURI* SSP. *CARNATICUS*	bacterium	CHEESE
74. *STAPHYLOCOCCUS VITULINUS*	bacterium	CHEESE
75. *STAPHYLOCOCCUS XYLOSUS*	bacterium	CHEESE
76. *STREPTOCOCCUS THERMOPHILUS*	bacterium	CHEESE
77. *LACTOBACILLUS DIOLIVORANS*	bacterium	CHICHA
78. *ACETOBACTER ACETI*	bacterium	CHOCOLATE
79. *ACETOBACTER FABARUM*	bacterium	CHOCOLATE
80. *ACETOBACTER PASTEURIANUS*	bacterium	CHOCOLATE
81. *ACETOBACTER SYZYGII*	bacterium	CHOCOLATE
82. *ACETOBACTER TROPICALIS*	bacterium	CHOCOLATE
83. *ASPERGILLUS FUMIGATUS*	fungus	CHOCOLATE
84. *BACILLUS CEREUS*	bacterium	CHOCOLATE
85. *BACILLUS COAGULANS*	bacterium	CHOCOLATE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
86. *BACILLUS LICHENIFORMIS*	bacterium	CHOCOLATE
87. *BACILLUS PUMILUS*	bacterium	CHOCOLATE
88. *BACILLUS STEAROTHERMOPHILUS*	bacterium	CHOCOLATE
89. *BACILLUS SUBTILIS*	bacterium	CHOCOLATE
90. *CANDIDA HUMICOLA*	fungus	CHOCOLATE
91. *CANDIDA PELLICULOSA*	fungus	CHOCOLATE
92. *CANDIDA RUGOSA*	fungus	CHOCOLATE
93. *CANDIDA TROPICALIS*	fungus	CHOCOLATE
94. *GLUCONACETOBACTER AZOTOCAPTANS*	bacterium	CHOCOLATE
95. *GLUCONACETOBACTER DIAZOTROPHICUS*	bacterium	CHOCOLATE
96. *GLUCONACETOBACTER JOHANNAE*	bacterium	CHOCOLATE
97. *GLUCONOBACTER OXYDANS*	bacterium	CHOCOLATE
98. *KLOECKERA AFRICANA*	fungus	CHOCOLATE
99. *KLOECKERA APIS*	fungus	CHOCOLATE
100. *KLOECKERA JAVANICA*	fungus	CHOCOLATE
101. *KLUYVEROMYCES MARXIANUS*	fungus	CHOCOLATE
102. *LACTOBACILLUS CACAONUM*	bacterium	CHOCOLATE
103. *LACTOBACILLUS CELLOBIOSUS*	bacterium	CHOCOLATE
104. *LACTOBACILLUS FABIFERMENTANS*	bacterium	CHOCOLATE
105. *LACTOBACILLUS FERMENTUM*	bacterium	CHOCOLATE
106. *LACTOBACILLUS GHANENSIS*	bacterium	CHOCOLATE
107. *LACTOBACILLUS HILGARDII*	bacterium	CHOCOLATE
108. *LACTOBACILLUS PLANTARUM*	bacterium	CHOCOLATE
109. *LACTOCOCCUS LACTIS*	bacterium	CHOCOLATE
110. *LEUCONOSTOC MESENTEROIDES*	bacterium	CHOCOLATE
111. *MUCOR RACEMOSUS*	fungus	CHOCOLATE
112. *RHODOTORULA GLUTINIS*	fungus	CHOCOLATE
113. *RHODOTORULA RUBRA*	fungus	CHOCOLATE
114. *SACCHAROMYCES CEREVISIAE*	fungus	CHOCOLATE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
115. *WEISSELLA FABARIA*	bacterium	CHOCOLATE
116. *WEISSELLA GHANESIS*	bacterium	CHOCOLATE
117. *LACTOBACILLUS COLLINOIDES*	bacterium	CIDER
118. *LACTOBACILLUS MALI*	bacterium	CIDER
119. *LACTOBACILLUS YAMANASHIENSIS*	bacterium	CIDER
120. *SACCHAROMYCES BAYANUS*	fungus	CIDER
121. *SACCHAROMYCES CEREVISIAE*	fungus	CIDER
122. *ACETOBACTER FABARUM*	bacterium	COFFEE
123. *ACETOBACTER TROPICALIS*	bacterium	COFFEE
124. *GLUCONACETOBACTER AZOTOCAPTANS*	bacterium	COFFEE
125. *GLUCONACETOBACTER DIAZOTROPHICUS*	bacterium	COFFEE
126. *GLUCONACETOBACTER JOHANNAE*	bacterium	COFFEE
127. *LEUCONOSTOC HOLZAPFELII*	bacterium	COFFEE
128. *ENTEROCOCCUS FAECALIS*	bacterium	CREAM
129. *BIFIDOBACTERIUM ANIMALIS*	bacterium	DAIRY
130. *BIFIDOBACTERIUM BIFIDUM*	bacterium	DAIRY
131. *BIFIDOBACTERIUM BREVE*	bacterium	DAIRY
132. *BIFIDOBACTERIUM INFANTIS*	bacterium	DAIRY
133. *BIFIDOBACTERIUM LACTIS*	bacterium	DAIRY
134. *BIFIDOBACTERIUM LONGUM*	bacterium	DAIRY
135. *BIFIDOBACTERIUM PSEUDOLONGUM*	bacterium	DAIRY
136. *BIFIDOBACTERIUM THERMOPHILUM*	bacterium	DAIRY
137. *CARNOBACTERIUM MALTAROMATICUM*	bacterium	DAIRY
138. *KOCURIA VARIANS*	bacterium	DAIRY

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
139. *LACTOBACILLUS ACIDIPISCIS*	bacterium	DAIRY
140. *LACTOBACILLUS GASSERI*	bacterium	DAIRY
141. *LACTOBACILLUS JOHNSONII*	bacterium	DAIRY
142. *LACTOBACILLUS NODENSIS*	bacterium	DAIRY
143. *LACTOBACILLUS PARACASEI*	bacterium	DAIRY
144. *LACTOBACILLUS SALIVARIUS*	bacterium	DAIRY
145. *LACTOBACILLUS TUCCETI*	bacterium	DAIRY
146. *PICHIA FERMENTANS*	fungus	DAIRY
147. *PROPIONIBACTERIUM FREUDENREICHII* SSP. *FREUDENREICHII*	bacterium	DAIRY
148. *STAPHYLOCOCCUS SUCCINUS*	bacterium	DAIRY
149. *STREPTOCOCCUS GALLOLYTICUS*	bacterium	DAIRY
150. *YARROWIA LIPOLYTICA*	fungus	DAIRY
151. *PROPIONIBACTERIUM FREUDENREICHII* SSP. *SHERMANII*	bacterium	EMMENTAL CHEESE
152. *PENICILLIUM ALBUM*	fungus	FARMHOUSE CHEESES
153. *CARNOBACTERIUM DIVERGENS*	bacterium	FISH
154. *LACTOBACILLUS ACIDIPISCIS*	bacterium	FISH
155. *LACTOBACILLUS ALIMENTARIUS*	bacterium	FISH
156. *LACTOBACILLUS FARCIMINIS*	bacterium	FISH
157. *LACTOBACILLUS PENTOSUS*	bacterium	FISH
158. *LEUCONOSTOC CITREUM*	bacterium	FISH
159. *STAPHYLOCOCCUS PISCIFERMENTANS*	bacterium	FISH
160. *WEISSELLA THAILANDENSIS*	bacterium	FISH
161. *LACTOBACILLUS ACETOTOLERANS*	bacterium	FRUIT

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
162. *LACTOBACILLUS PENTOSUS*	bacterium	FRUIT
163. *LACTOBACILLUS POBUZIHII*	bacterium	FRUIT
164. *LACTOBACILLUS SUEBICUS*	bacterium	FRUIT
165. *LACTOBACILLUS VACCINOSTERCUS*	bacterium	FRUIT
166. *LACTOBACILLUS CASEI SSP. PSEUDOPLANTARUM*	bacterium	GRANA PADANO CHEESE
167. *LACTOBACILLUS RHAMNOSUS*	bacterium	GRANA PADANO CHEESE
168. *BRACHYBACTERIUM ALIMENTARIUM*	bacterium	GRUYÈRE CHEESE
169. *BRACHYBACTERIUM TYROFERMENTANS*	bacterium	GRUYÈRE CHEESE
170. *ENTEROCOCCUS FAECALIS*	bacterium	HAM
171. *ENTEROCOCCUS FAECIUM*	bacterium	HAM
172. *PENICILLIUM NALGIOVENSE*	fungus	HAM
173. *STAPHYLOCOCCUS SAPHROPHYTICUS*	bacterium	HARZER CHEESE
174. *LACTOBACILLUS CASEI*	bacterium	IDIAZABAL CHEESE
175. *LACTOBACILLUS PLANTARUM*	bacterium	IDIAZABAL CHEESE
176. *LEUCONOSTOC MESENTEROIDES SSP. DEXTRANICUM*	bacterium	IDIAZABAL CHEESE
177. *LEUCONOSTOC MESENTEROIDES SSP. MESENTEROIDES*	bacterium	IDIAZABAL CHEESE
178. *CANDIDA COLLICULOSA*	fungus	KEFIR
179. *ISSATCHENKIA ORIENTALIS*	fungus	KEFIR
180. *KAZACHSTANIA EXIGUA*	fungus	KEFIR
181. *KAZACHSTANIA UNISPORA*	fungus	KEFIR
182. *LACTOBACILLUS BREVIS SSP. LINENS*	bacterium	KEFIR
183. *LACTOBACILLUS KEFIRANOFACIENS*	bacterium	KEFIR
184. *LACTOBACILLUS KEFIRI*	bacterium	KEFIR

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
185. *LACTOBACILLUS PARABREVIS*	bacterium	KEFIR
186. *LACTOBACILLUS PARAKEFIRI*	bacterium	KEFIR
187. *PICHIA FERMENTANS*	fungus	KEFIR
188. *ZYGOTORULASPORA FLORENTINA*	fungus	KEFIR
189. *LACTOBACILLUS KIMCHII*	bacterium	KIMCHI
190. *LEUCONOSTOC INHAE*	bacterium	KIMCHI
191. *LEUCONOSTOC KIMCHII*	bacterium	KIMCHI
192. *TETRAGENOCOCCUS KOREENSIS*	bacterium	KIMCHI
193. *WEISSELLA CIBARIA*	bacterium	KIMCHI
194. *WEISSELLA KOREENSIS*	bacterium	KIMCHI
195. *SACCHAROMYCES CARLSBERGENSIS*	fungus	LAGER BEER
196. *SACCHAROMYCES PASTORIANUS*	fungus	LAGER BEER
197. *SACCHAROMYCES UVARUM*	fungus	LAGER BEER
198. *CANDIDA MYCODERMA*[10]	fungus	LIMBURGER CHEESE
199. *DEBARYOMYCES KLOECKERI*	fungus	LIMBURGER CHEESE
200. *MICROBACTERIUM GUBBEENENSE*	bacterium	LIMBURGER CHEESE
201. *ENTEROCOCCUS FAECIUM*	bacterium	MANCHEGO CHEESE
202. *LACTOBACILLUS CASEI*	bacterium	MANCHEGO CHEESE
203. *LACTOBACILLUS PLANTARUM*	bacterium	MANCHEGO CHEESE
204. *CARNOBACTERIUM DIVERGENS*	bacterium	MEAT
205. *CARNOBACTERIUM PISCICOLA*	bacterium	MEAT
206. *HALOMONAS ELONGATA*	bacterium	MEAT
207. *KOCURIA RHIZOPHILA*	bacterium	MEAT
208. *LACTOBACILLUS ALIMENTARIUS*	bacterium	MEAT
209. *LACTOBACILLUS DEXTRINICUS*	bacterium	MEAT

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
210. *LACTOBACILLUS PARACASEI*	bacterium	MEAT
211. *LACTOBACILLUS RHAMNOSUS*	bacterium	MEAT
212. *LEUCONOSTOC CARNOSUM*	bacterium	MEAT
213. *PENICILLIUM SOLITUM*	fungus	MEAT
214. *STAPHYLOCOCCUS EQUORUM*	bacterium	MEAT
215. *STAPHYLOCOCCUS SUCCINUS*	bacterium	MEAT
216. *STAPHYLOCOCCUS VITULINUS*	bacterium	MEAT
217. *STAPHYLOCOCCUS WARNERI*	bacterium	MEAT
218. *STREPTOMYCES GRISEUS*	bacterium	MEAT
219. *STREPTOMYCES MOBARAENSIS*	bacterium	MEAT, FISH
220. *ASPERGILLUS ORYZAE*	fungus	MISO
221. *ASPERGILLUS SOJAE*	fungus	MISO
222. *ENTEROCOCCUS FAECALIS*	bacterium	MISO
223. *ENTEROCOCCUS FAECIUM*	bacterium	MISO
224. *SACCHAROMYCES ROUZII*	fungus	MISO
225. *TETRAGENOCOCCUS HALOPHILUS*	bacterium	MISO
226. *TORULOPSIS VERSATILIS*	fungus	MISO
227. *BACILLUS SUBTILIS*	bacterium	NATTO
228. *LACTOBACILLUS SPP.*	bacterium	OLIVE
229. *LEUCONOSTOC SPP.*	bacterium	OLIVE
230. *NEUROSPORA INTERMEDIA*	fungus	ONCOM
231. *RHIZOPUS MICROSPORUS SSP. OLIGOSPORUS*	fungus	ONCOM
232. *LEUCONOSTOC PALMAE*	bacterium	PALM WINE
233. *ZYMOMONAS MOBILIS*	bacterium	PALM WINE
234. *LACTOBACILLUS CASEI SSP. PSEUDOPLANTARUM*	bacterium	PARMIGIANO-REGGIANO CHEESE
235. *LACTOBACILLUS RHAMNOSUS*	bacterium	PARMIGIANO-REGGIANO CHEESE
236. *LACTOBACILLUS CURVATUS*	bacterium	PECORINO ROMANO CHEESE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
237. *LACTOBACILLUS DELBRUECKII SSP. LACTIS*	bacterium	PECORINO ROMANO CHEESE
238. *LACTOBACILLUS FERMENTUM*	bacterium	PECORINO ROMANO CHEESE
239. *LACTOBACILLUS PLANTARUM*	bacterium	PECORINO ROMANO CHEESE
240. *LACTOBACILLUS CURVATUS*	bacterium	PECORINO SARDO CHEESE
241. *LACTOBACILLUS PARACASEI SSP. PARACASEI*	bacterium	PECORINO SARDO CHEESE
242. *ENTEROCOCCUS FAECALIS*	bacterium	PICKLE
243. *ENTEROCOCCUS FAECIUM*	bacterium	PICKLE
244. *LACTOBACILLUS KISONENSIS*	bacterium	PICKLE
245. *LACTOBACILLUS OTAKIENSIS*	bacterium	PICKLE
246. *LACTOBACILLUS RAPI*	bacterium	PICKLE
247. *LACTOBACILLUS SUNKII*	bacterium	PICKLE
248. *LEUCONOSTOC MESENTEROIDES SSP. DEXTRANICUM*	bacterium	PICKLE
249. *LACTOBACILLUS SENMAIZUKEI*	bacterium	PICKLES
250. *ZYMOMONAS MOBILIS*	bacterium	PULQUE
251. *YARROWIA LIPOLYTICA*	fungus	RACLETTE CHEESE
252. *CANDIDA ZEYLANOIDES*	fungus	REBLOCHON CHEESE
253. *DEBARYOMYCES HANSENII*	fungus	REBLOCHON CHEESE
254. *CANDIDA VINI*[10]	fungus	REBLOCHON CHEESE, WINE
255. *LACTOBACILLUS CASEI*	bacterium	RONCAL CHEESE
256. *LACTOBACILLUS PLANTARUM*	bacterium	RONCAL CHEESE
257. *LEUCONOSTOC MESENTEROIDES SSP. DEXTRANICUM*	bacterium	RONCAL CHEESE
258. *LEUCONOSTOC MESENTEROIDES SSP. MESENTEROIDES*	bacterium	RONCAL CHEESE
259. *LACTOBACILLUS MALI*	bacterium	RUM
260. *LACTOBACILLUS SIMILIS*	bacterium	RUM
261. *ASPERGILLUS ORYZAE*	fungus	SAKE
262. *LACTOBACILLUS HOMOHIOCHII*	bacterium	SAKE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
263. *LACTOBACILLUS SAKEI*	bacterium	SAKE
264. *LEUCONOSTOC FALLAX*	bacterium	SAUERKRAUT
265. *ENTEROCOCCUS FAECALIS*	bacterium	SAUSAGE
266. *KOCURIA VARIANS*	bacterium	SAUSAGE
267. *LACTOBACILLUS CURVATUS*	bacterium	SAUSAGE
268. *LACTOBACILLUS PLANTARUM*	bacterium	SAUSAGE
269. *LACTOBACILLUS SAKEI*	bacterium	SAUSAGE
270. *LACTOBACILLUS TUCCETI*	bacterium	SAUSAGE
271. *LACTOBACILLUS VERSMOLDESIS*	bacterium	SAUSAGE
272. *MACROCOCCUS CASEOLYTICUS*	bacterium	SAUSAGE
273. *MICROCOCCUS LYLAE*	bacterium	SAUSAGE
274. *PEDIOCOCCUS ACIDILACTICI*	bacterium	SAUSAGE
275. *PEDIOCOCCUS PENTOSACEUS*	bacterium	SAUSAGE
276. *PENICILLIUM CHRYSOGENUM*	fungus	SAUSAGE
277. *PENICILLIUM NALGIOVENSE*	fungus	SAUSAGE
278. *STAPHYLOCOCCUS CARNOSUS* SSP. *CARNOSUS*	bacterium	SAUSAGE
279. *STAPHYLOCOCCUS SIMULANS*	bacterium	SAUSAGE
280. *STAPHYLOCOCCUS XYLOSUS*	bacterium	SAUSAGE
281. *WEISSELLA PARAMESENTEROIDES*	bacterium	SAUSAGE
282. *LACTOBACILLUS COMPOSTI*	bacterium	*SHŌCHŪ*
283. *LACTOBACILLUS SATSUMENSIS*	bacterium	*SHŌCHŪ*
284. *ARTHROBACTER ARILAITENSIS*	bacterium	SMEAR-RIPENED CHEESE
285. *ARTHROBACTER BERGEREI*	bacterium	SMEAR-RIPENED CHEESE
286. *ARTHROBACTER GLOBIFORMIS*	bacterium	SMEAR-RIPENED CHEESE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
287. *ARTHROBACTER VARIABILIS*	bacterium	SMEAR-RIPENED CHEESE
288. *BREVIBACTERIUM CASEI*	bacterium	SMEAR-RIPENED CHEESE
289. *BREVIBACTERIUM LINENS*	bacterium	SMEAR-RIPENED CHEESE
290. *CORYNEBACTERIUM CASEI*	bacterium	SMEAR-RIPENED CHEESE
291. *CORYNEBACTERIUM MOOREPARKENSE*	bacterium	SMEAR-RIPENED CHEESE
292. *DEBARYOMYCES HANSENII*	fungus	SMEAR-RIPENED CHEESE
293. *MICROBACTERIUM GUBBEENENSE*	bacterium	SMEAR-RIPENED CHEESE
294. *RHODOTORULA MINUTA*	fungus	SMEAR-RIPENED CHEESE
295. *TORULASPORA DELBRUECKII*	fungus	SMEAR-RIPENED CHEESE
296. *THRICHOSPORON BEIGELII*	fungus	SMEAR-RIPENED CHEESE
297. *YARROWIA LIPOLYTICA*	fungus	SMEAR-RIPENED CHEESE
298. *LEUCONOSTOC PSEUDOMESENTEROIDES*	bacterium	SOUR CREAM
299. *CANDIDA VALIDA*[10]	fungus	SOURDOUGH
300. *CANDIDA EXIGUUS*	fungus	SOURDOUGH BREAD
301. *CANDIDA MILLERI*	fungus	SOURDOUGH BREAD
302. *LACTOBACILLUS ACETOTOLERANS*	bacterium	SOURDOUGH BREAD
303. *LACTOBACILLUS ACIDIFARINAE*	bacterium	SOURDOUGH BREAD
304. *LACTOBACILLUS CRISPATUS*	bacterium	SOURDOUGH BREAD
305. *LACTOBACILLUS FERMENTUM*	bacterium	SOURDOUGH BREAD
306. *LACTOBACILLUS GASSERI*	bacterium	SOURDOUGH BREAD
307. *LACTOBACILLUS HAMMESII*	bacterium	SOURDOUGH BREAD
308. *LACTOBACILLUS HOMOHIOCHII*	bacterium	SOURDOUGH BREAD
309. *LACTOBACILLUS JOHNSONII*	bacterium	SOURDOUGH BREAD
310. *LACTOBACILLUS MINDENSIS*	bacterium	SOURDOUGH BREAD
311. *LACTOBACILLUS MUCOSAE*	bacterium	SOURDOUGH BREAD

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
312. *LACTOBACILLUS NAMURESIS*	bacterium	SOURDOUGH BREAD
313. *LACTOBACILLUS NANTESIS*	bacterium	SOURDOUGH BREAD
314. *LACTOBACILLUS PANIS*	bacterium	SOURDOUGH BREAD
315. *LACTOBACILLUS PARABUCHNERI*	bacterium	SOURDOUGH BREAD
316. *LACTOBACILLUS PARALIMENTARIUS*	bacterium	SOURDOUGH BREAD
317. *LACTOBACILLUS PONTIS*	bacterium	SOURDOUGH BREAD
318. *LACTOBACILLUS REUTERI*	bacterium	SOURDOUGH BREAD
319. *LACTOBACILLUS ROSSIAE*	bacterium	SOURDOUGH BREAD
320. *LACTOBACILLUS SANFRANCISCENSIS*	bacterium	SOURDOUGH BREAD
321. *LACTOBACILLUS SECALIPHILUS*	bacterium	SOURDOUGH BREAD
322. *LACTOBACILLUS SILIGINIS*	bacterium	SOURDOUGH BREAD
323. *LACTOBACILLUS SPICHERI*	bacterium	SOURDOUGH BREAD
324. *BIFIDOBACTERIUM BREVE*	bacterium	SOY
325. *LACTOBACILLUS FARCIMINIS*	bacterium	SOY
326. *STAPHYLOCOCCUS CONDIMENTI*	bacterium	SOY
327. *MUCOR HIEMALIS*	fungus	SOY BEAN CURD
328. *ASPERGILLUS ORYZAE*	fungus	SOY SAUCE
329. *ASPERGILLUS SOJAE*	fungus	SOY SAUCE
330. *ENTEROCOCCUS FAECALIS*	bacterium	SOY SAUCE
331. *ENTEROCOCCUS FAECIUM*	bacterium	SOY SAUCE
332. *TETRAGENOCOCCUS HALOPHILUS*	bacterium	SOY SAUCE
333. *BACILLUS SPHAERICUS*	bacterium	STINKY TOFU
334. *ARTHROBACTER NICOTIANAE*	bacterium	SURFACE-RIPENED CHEESE
335. *CANDIDA KEFYR*	fungus	SURFACE-RIPENED CHEESE
336. *CANDIDA KRUSEI*	fungus	SURFACE-RIPENED CHEESE
337. *MICROBACTERIUM FOLIORUM*	bacterium	SURFACE-RIPENED CHEESE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
338. *PENICILLIUM COMMUNE*	fungus	SURFACE-RIPENED CHEESE
339. *PROTEUS VULGARIS*	bacterium	SURFACE-RIPENED CHEESE
340. *ASPERGILLUS ACIDUS*	fungus	TEA
341. *RHIZOPUS MICROSPORUS SSP. OLIGOSPORUS*	fungus	TEMPEH
342. *ARTHROBACTER NICOTIANAE*	bacterium	TILSIT CHEESE
343. *MICROBACTERIUM GUBBEENENSE*	bacterium	TILSIT CHEESE
344. *VERTICILLIUM LECANII*	fungus	TOMME CHEESE
345. *ACETOBACTER LOVANIENSIS*	bacterium	VEGETABLES
346. *ACETOBACTER ORIENTALIS*	bacterium	VEGETABLES
347. *LACTOBACILLUS ACETOTOLERANS*	bacterium	VEGETABLES
348. *LACTOBACILLUS ACIDOPHILUS*	bacterium	VEGETABLES
349. *LACTOBACILLUS BREVIS*	bacterium	VEGETABLES
350. *LACTOBACILLUS DELBRUECKII*	bacterium	VEGETABLES
351. *LACTOBACILLUS HARBINENSIS*	bacterium	VEGETABLES
352. *LACTOBACILLUS HELVETICUS*	bacterium	VEGETABLES
353. *LACTOBACILLUS PARABREVIS*	bacterium	VEGETABLES
354. *LACTOBACILLUS PARAPLANTARUM*	bacterium	VEGETABLES
355. *LACTOBACILLUS PEROLENS*	bacterium	VEGETABLES
356. *LACTOBACILLUS PLANTARUM*	bacterium	VEGETABLES
357. *LACTOBACILLUS RAPI*	bacterium	VEGETABLES
358. *LACTOBACILLUS RHAMNOSUS*	bacterium	VEGETABLES
359. *LACTOBACILLUS VACCINOSTERCUS*	bacterium	VEGETABLES
360. *LEUCONOSTOC MESENTEROIDES*	bacterium	VEGETABLES

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
361. *LEUCONOSTOC MESENTEROIDES SSP. CREMORIS*	bacterium	VEGETABLES
362. *PEDIOCOCCUS ACIDILACTICI*	bacterium	VEGETABLES
363. *ACETOBACTER ACETI*	bacterium	VINEGAR
364. *ACETOBACTER MALORUM*	bacterium	VINEGAR
365. *ACETOBACTER PASTEURIANUS*	bacterium	VINEGAR
366. *ACETOBACTER POMORUM*	bacterium	VINEGAR
367. *ACETOBACTER SYZYGII*	bacterium	VINEGAR
368. *GLUCONACETOBACTER ENTANII*	bacterium	VINEGAR
369. *GLUCONACETOBACTER EUROPAEUS*	bacterium	VINEGAR
370. *GLUCONACETOBACTER HANSENII*	bacterium	VINEGAR
371. *GLUCONACETOBACTER OBOEDIENS*	bacterium	VINEGAR
372. *GLUCONACETOBACTER XYLINUS*	bacterium	VINEGAR
373. *CYBERLINDNERA MRAKII*	fungus	WINE
374. *LACTOBACILLUS BUCHERI*	bacterium	WINE
375. *LACTOBACILLUS HILGARDII*	bacterium	WINE
376. *LACTOBACILLUS KUNKEEI*	bacterium	WINE
377. *LACTOBACILLUS MALI*	bacterium	WINE
378. *LACTOBACILLUS NAGELII*	bacterium	WINE
379. *LACTOBACILLUS OENI*	bacterium	WINE
380. *LACTOBACILLUS PENTOSUS*	bacterium	WINE
381. *LACTOBACILLUS YAMANASHIENSIS*	bacterium	WINE
382. *LEUCONOSTOC SPP.*	bacterium	WINE
383. *OENOCOCCUS OENI*	bacterium	WINE
384. *PICHIA FERMENTANS*	fungus	WINE
385. *SACCHAROMYCES BAYANUS*	fungus	WINE
386. *SACCHAROMYCES CEREVISIAE*	fungus	WINE

MICROORGANISM	TYPE OF MICROORGANISM	FOOD OR BEVERAGE
387. *BIFIDOBACTERIUM ADOLESCENTIS*	bacterium	YOGURT
388. *LACTOBACILLUS ACIDOPHILUS*	bacterium	YOGURT
389. *LACTOBACILLUS CASEI*	bacterium	YOGURT
390. *LACTOBACILLUS DELBRUECKII* SSP. *BULGARICUS*	bacterium	YOGURT
391. *PSEUDOMONAS FLUORESCENS*	bacterium	YOGURT
392. *STREPTOCOCCUS SALIVARIUS*	bacterium	YOGURT
393. *STREPTOCOCCUS THERMOPHILUS*	bacterium	YOGURT

Evaluation of Hand Hygiene Perceptions & practice amongst health care workers in Saudi Arabian hospitals

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ABSTRACT

HAND HYGIENE is associated with increase morbidity, mortality,

prolonged hospital stay, increased health care costs, and antibiotic resistance in both acute and long term care facilities. Hand hygiene, such as hand washing and hand rub, has been the cornerstone of infection prevention and control measures in reducing HAND HYGIENE. The aim of the study is to assess the perception towards hand hygiene amongst healthcare professionals such as doctors and nurses in the Ministry of Interior Security hospital, Saudi Arabia.

A descriptive survey using a modified World Health Organization (revised 2009) questionnaire was used to gather data. A total of 87 respondents participated in the study. Results showed that respondents (27.6%) are aware that HAND HYGIENE has an impact on patient outcome (X^2= 46.5; $p < 0.05$), hospitalized patient will likely develop HAND HYGIENE (X^2= 50.4; $p < 0.05$), and hand hygiene remains to be the single and most effective method against HAND HYGIENE (X^2= 52.2; $p < 0.05$). Respondents reported a high self-efficacy (X^2= 127.3; $p < 0.05$) in performing hand hygiene.

Organizational factors such as staff engagement, commitment of the department heads and leadership are perceived to be significant in promoting hand hygiene practices. Strategies such as provision of access to hand hygiene facilities, guidelines, education and training, positive role modeling are effective. In conclusion, the findings suggest that health care workers have a high level of awareness about HAND HYGIENEs and the importance of hand hygiene.

Furthermore, assessment of knowledge thru self-report is not enough to determine compliance of hand hygiene practices. Observational studies are recommended.

KEYWORDS:

HAND HYGIENE, Hand Hygiene, Nurses, Survey, Questionnaire.

INTRODUCTION

World Health Organization (2009) defines "HAND HYGIENE Associated Infections (HAND HYGIENE), also referred to as "nosocomial" or "hospital" infection, as an infection occurring in a patient during the process of care in a hospital or other healthcare facility which was not present or incubating at the time of admission." HAND HYGIENE is associated with increase morbidity, mortality, prolonged hospital stay, increased health care costs, and antibiotic resistance in both acute and long term care facilities (Shah, and Singhal, 2013).

Hand hygiene, such as hand washing and hand rub, has been the cornerstone of infection prevention and control measures in reducing HAND HYGIENE (Center for Disease Control, 2010). Despite the numerous guidelines published, compliance remain to be a challenge to achieve and sustain. Studies of Halwani, Tashkani, and Basuny (2010) in ten Intensive Care Units in Saudi Arabia about the incidence of HCAI's detected 851 HAND HYGIENE among 5,523 patients admitted and stayed for 53,025 days with a mean length of stay of 9 days.

The incidence rate for HCAI was 16 per 1000 patients' days. Al-Tawfiq, Abed, Al-Yami, and Birrer (2012) conducted a descriptive time series study using multimodal International Journal of Caring Sciences January-April 2015 Volume 8 Issue 1 Page 109 www.internationaljournalofcaringsciences.org interventions from October 2006 to December 2011 set in a 350-bed community hospital in Saudi Arabia. The rate of health care-associated methicillin-resistant Staphylococcus aureus per 1,000 patient-days decreased from 0.42 in 2006 to 0.08 in 2011.

Ventilator-associated infection rates decreased from 6.12 to 0.78, central line-associated bloodstream infections rates decreased from 8.23 to 4.8, and catheter-associated urinary tract infection rates decreased from 7.08 to 3.5. Allegranzi

et al. (2013) conducted a global implementation of WHO's multimodal strategy for improvement of hand hygiene using a quasi experimental study in five countries including Saudi Arabia. These prior studies show that implementation of WHO's hand-hygiene strategy is feasible and sustainable across a range of settings in different countries and leads to significant compliance and knowledge improvement in healthcare workers, supporting recommendation for use worldwide.

Whereas these WHO multi-modal strategy and previous studies indicate that this is effective in reducing HAIs and increasing hand hygiene compliance. The researchers as part of the Infection Control and Prevention Committee in the hospital would like to support the WHO hand hygiene campaign by conducting the study using the WHO approved tool kit.

The WHO tool kit offer a series of assessment and intervention framework to identify problems and strategies to improve hand hygiene practices in the hospital. Our study is in the initial phase of establishing the baseline data for the knowledge of healthcare workers about hand hygiene.

SIGNIFICANCE OF STUDY

Hand hygiene is described by many health care workers as the single most important tool in preventing the spread of health care-associated infections between patients.

According to WHO, there are few definitive data on the patient-care activities that are most likely to transmit bacteria to worker hands, but there have been several studies that identified many possibilities. Although bacteria have been found on HEALTH CARE WORKER hands after activities such as wound care, intravascular catheter care, respiratory tract care and handling patient secretions as expected, bacteria also have been found on HEALTH CARE WORKER hands after so-called "clean" contact, such as taking a patient's pulse, temperature or blood pressure.

Organisms found on HEALTH CARE WORKER hands after such patient contact range from Klebsiella spp., Staphylococcus aureus, Clostridium difficile, MRSA and gram-negative bacteria. However, direct patient contact is not the only way HEALTH CARE WORKER hands can be contaminated. HEALTH CARE WORKERs can acquire bacteria on their hands by touching contaminated surfaces in the patient environment and simply by touching a contaminated chart at the nurses' station, according to the literature.

Washing hands before and after patient contact seems like a simple solution to prevent the spread of bacteria between patients. Most hospitals have hand hygiene policies in place that guide their employees to do just that. But it is not as simple as it seems.

"When we look at all of the things that we can do to prevent infections in the hospital, one of the most important things about hand hygiene is that it works for so many different types of organisms, and you get a lot of bang for the buck," **Michael Edmond, MD, MPH**, the Richard P. Wenzel professor of internal medicine in the division of infectious diseases at Virginia Commonwealth University, told *Infectious Disease News.* "The issue is that you have to practice it at a high level of compliance for it to work. There are so many opportunities for hand hygiene, and it is difficult to get to a level of compliance where we're able to make changes to infection rates."

THE AIM OF THE STUDY

The purpose of this study is to support the WHO hand hygiene campaign against HAND HYGIENE. It aims to assess the perception towards hand hygiene amongst healthcare professionals in the hospital. Specifically, it seeks to identify perceptions on health care-associated infections and hand hygiene.

RESEARCH HYPOTHESIS ***SETTING***

A descriptive study using a standardized survey questionnaire of the World Health Organization (WHO) was performed. Descriptive survey design aims to observe, describe, analyze and document aspects of situation as it naturally occurs (Polit & Beck, 2004).

In this situation, the perceptions about healthcare associated infection and hand hygiene were the focus of the study. The study was conducted at the Ministry of Interior Security Hospitals, Jeddah Kingdom of Saudi Arabia and was completed last July 2013.

PARTICIPANTS AND SAMPLING

A purposive sampling was done to meet the inclusion and exclusion criteria. The participants consisted of various healthcare professional working in the hospital.

The participants included in the study were healthcare professional i.e. medical doctors, nurses and others who have a direct contact to patients at least on a daily basis, understands English and willing to participate in the survey.

Participants who did not meet the inclusion criteria were excluded. There were a total of 102 healthcare professionals eligible and was invited to participate in the study. However, there were only 87 participants who completed and returned the survey questionnaire.

TOOLS FOR DATA COLLECTION AND ANALYSIS

The study utilized the “Perception Survey for Health-Care Workers” questionnaire which was formulated and recommended by the World Health Organization (WHO) in their campaign for patient safety. It is a self-administered 21-item questionnaire used to measure perception with regards to healthcare associated infection and hand hygiene. This

questionnaire has been reliable and validated by World Health Organization (WHO). It is easy to administer and takes about 10 minutes to fill-out.

The questionnaire was slightly modified by the researchers to remove irrelevant items and to ensure that items reflect the context where the research is conducted. Moreover, some terms were simplified to make it clear.

RESEARCH QUESTIONS

The first eight question asked about demographic characteristics. There were three items that pertains to perceptions about healthcare associated infection and ten items related to perceptions about hand hygiene practices. Possible answers to question were varied ranging from a yes or no response, one to seven rating and using a four point Likert scale. Information package, consent and the 21-item of questionnaire were altogether distributed to the identified eligible participants. SPSS statistical software version 17 was used for statistical analysis of the collected data.

STATISTICAL DESIGN

Descriptive statistics and inferential non-parametric Chi-squared (X^2) test was used. For statistical tests, P-values less than 0.05 were considered to be statistically significant.

ETHICAL CONSIDERATIONS

Ethical considerations were addressed by seeking the ethical approval from the Infection Control and Prevention Committee of the hospital. Research permit was sought from the hospital director. Participation in the study is completely voluntary. Information package and informed consent was provided.

Results There were a total of 87 healthcare professionals who participated. Nurses (64.4%) accounts for the majority of the

participants, followed by physician (20.7%) and other healthcare professional (14.9%) such as psychologist, technicians, therapists and dietician. Males (94.3%) were the predominant respondent in the study as compared with the female (5.7%) participants. The mean age was 32.3 + 8.3 years.

PILOT STUDY

Infection Participants were asked to identify the percentage of the hospitalized patients who will develop HAND HYGIENE. The responses obtained were varied and widely distributed from 0-100%. However, 27.6% of the respondents believed that there is about 0 – 10% chances that hospitalized patients will develop HAND HYGIENE.

On the other hand, there were 19.5% respondents who claimed that they don't have the knowledge of the occurrence of healthcare associated infection in the hospital. The difference among the respondent's perceptions about the percentage of hospitalized patients developing HAND HYGIENE was significant (X^2= 50.4; $p < 0.05$).

On the other hand, there was a significant difference in the perception of impact of health care-associated infection on a patient's clinical outcome (X^2= 46.5; $p < 0.05$). Most of the participants believed that there is a high (54%) and very high (21.8%) impact of HAND HYGIENE in patient's clinical outcome.

Lastly, Table 1 shows that there was a significant difference (X^2= 52.2; $p < 0.05$) in the respondents perceptions about the effectiveness of hand hygiene as measures to prevent HAND HYGIENE. Majority (99%) of the respondents knew and agreed that hand hygiene is the single and most effective against HAND HYGIENE. Perceptions about Hand Hygiene Three quarters of the participants had undertaken a formal training in hand hygiene in the last two years. When asked about the routine use of alcohol based hand rub when performing hand hygiene,

97.7% of the respondents agreed to prefer the hand rub method.

Among all patient safety issues, there was a significant difference (X^2= 42.3; $p < 0.05$) about the respondents perception as to the importance of hand hygiene at the institution. Respondents believed that hand hygiene has a high (43.7%) and very high (55.2%) priority in their affiliated hospital. When asked about the percentage of situations requiring hand hygiene and the actual performance of hand hygiene either by hand rubbing or hand washing among healthcare workers in the hospital, the response varied between 0 to 100%.

Around 67.7 % of the respondents believed that the actual performance of hand hygiene is between 70-100% which was significant (X^2= 78.2; $p < 0.05$).

Managers' support and promotion of hand hygiene (34.5%), alcohol based hand rub availability at each point of care (60.9%), displays of hand hygiene posters (57.5%), education on hand hygiene (40.2%), visible clear and simple instructions for hand hygiene (52.9%), positive role modeling (51.8%) and patient reminding healthcare workers to perform hand hygiene (26.4%) were found significant interventions to promote and improve hand hygiene practices in the hospital as shown in Table 2.

TABLE 1. IMPACT OF HAND HYGIENE ON PATIENT'S CLINICAL OUTCOME AND EFFECTIVENESS OF HAND HYGIENE AS PREVENTIVE MEASURES.

RESPONDENT'S OPINION	VERY LOW	LOW	HIGH	VERY HIGH	X^2 (p-value)

Impact of HCAI on patient's clinical outcome	3 2.4%	18 20.7%	47 54%	19 21.7%	46 (0.000)
Effectiveness of Hand Hygiene in preventing HAND HYGIENE	1 (1.1%)	0 (0%)	30 (34.5%)	56 (64.7)	53.2 (0.000)

<<*>>HH means HAND HYGIENE

TABLE 2. EFFECTIVENESS OF VARIOUS STRATEGIES TO IMPROVE HAND HYGIENE PRACTICES.

ACTIONS	1 Not Effective	2	3	4	5	6	7 Very Effective	X^2 (p-value)
Managers support and promote HH	0 (0.0%)	0 (0.0%)	3 (3.4%)	14 (16.1%)	17 (19.5%)	23 (26.2%)	30 (33.0%)	23.5 (0.000%)
Handrub alwaysavailable	0 (0.0%)	0 (0.0%)	1 (1.1%)	2 (2.4%)	9 (10.3%)	22 (25.3%)	53 (60.9%)	107.1 (0.000)
Posters displayed	0 (1.1%)	0 (2.3%)	1 (1.1%)	3 (6.9%)	8 (9.6%)	25 (25%)	50 (57%)	96.8 (%)
Receive education on hand hygiene	1 (1.1%)	2 (2.3%)	1 (1.1%)	6 (6.9%)	11 (12.6%)	31 (35.6%)	35 (40.20%)	102.0 (0.000%)

Clear and simple instructions visible	0 (%)	0 (%)	1 (%)	2 (%)	11 (%)	27 (%)	46 (%)	83.4 (%)
Feedback regularly provided	0 (0.0%)	0 (4.6%)	4 (3.4%)	4 (14.6%)	12 (14.2%)	27 (31.2%)	23 (26.4%)	33.2 (0.00%)
Good example for role modeling	0 (0.0%)	0 (4.6%)	5 (3.6%)	3 (14.0%)	11 (14.4%)	27 (31.2%)	22 (26.5%)	33.99 (0.00%)
Patient remind staff	0 (0.0%)	1 (4.5%)	3 (3.4%)	4 (14.7%)	13 (14.3%)	26 (31.1%)	22 (26.3%)	34.2 (0.00%)

Interestingly, there was a significant difference in the respondent's (31%) perception that regular feedback on hand hygiene performance was not as effective as compared with the above mentioned strategies.

Moreover, the respondents perceived that the head of the department ($X^2 = 58.6$; $p < 0.05$), colleagues ($X^2 = 63$; $p < 0.05$) and patients ($X^2 = 64.5$; $p < 0.05$) placed a very high importance in adhering to optimal hand hygiene performance during the care process. These perceptions were found to be significant.

At a personal level, respondents were asked to reflect about their effort to perform good hand hygiene when caring for patients. Almost half of the respondents considered that it was a big effort on their part to perform hand hygiene in caring for patients.

Furthermore, when asked about their own performance of hand hygiene requiring situation, around 80% of the respondents answered that between 80 -100% of the required situation they perform optimal hand hygiene and the result was significant ($X^2 = 127.3$; $p < 0.05$).

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DISCUSSION

The study investigated the perception towards hand hygiene

among healthcare professionals in the hospital. The results showed that health care professionals have a very high level of knowledge about health care-associated infections and the role of hand hygiene.

First, the study showed that respondents have a very high perception that HAND HYGIENEs have a significant impact in patient outcome.

The result showed that majority of the respondents believed that there is a 0-10% chances that hospitalized patients will develop HAND HYGIENE. The result was congruent to the WHO Report in 2011 on the burden of endemic HAND HYGIENE worldwide.

According to the report seven out of 100 hospitalized patients in developed countries and ten out of 100 hospitalized patients in developing countries will develop at least one healthcare-associated infection.

In a similar study conducted by Burnett (2009), clinical ward nurses demonstrates good perceptions about HAND HYGIENEs and positive attitudes toward hand hygiene.

However, a secondary finding in the study showed that these high level of awareness was not found to be independently associated with positive behavior. This mean that being knowledgeable does not necessarily translates to high level of compliance. On the other hand, Most of the participants believed that there was a high (54%) and very high (21.8%) impact of HAND HYGIENE in patient’s clinical outcome and hand hygiene (99%) remains the single and most effective against HAND HYGIENE.

Previous studies of Tai et al. (2009) showed that 70% of the nurses and 49% of the physicians perceived that over 15% of patients would suffer from healthcare-associated infections. A total of 79% of the nurses and 68% of the physicians believed that more than 5% of patients would die as a result of

healthcare-associated infection. A total of 60% of the nurses and 46% of the physicians acknowledged that over 75% of healthcare-associated infections could be prevented by optimal hand hygiene practices.

Second, the results of our study not only confirm with the previous but also showed that majority of the health care professional (99%) had a very high degree of awareness about the effectiveness of hand hygiene against HAND HYGIENE. This awareness can be attributed to formal training attended previously by the respondents.

Nteli et al. (2012) reported that educational activities were important factor to improve health-care workers hand hygiene practices. In contrast, De Wandel et al. (2010) argued that neither having good theoretical knowledge of hand hygiene guidelines nor social influence or moral perceptions does not influence hand hygiene practices. Self-efficacy is a determinant factor for compliance with hand hygiene.

When asked about self-efficacy, half of the respondents considered that it was a big effort on their part to perform hand hygiene in caring for patients and around 80% of the respondents answered that between 80 -100% of the required situation they perform optimal hand hygiene. Previous study reported that nurses reporting a poor self-efficacy or a poor attitude toward time related barriers appear to be less compliant (De Wandel et al. 2010).

Speaking about factors and determinants, Tai et al. (2009) found that perceived behavioral control and subjective norms were the most important factors associated with the nurses and physicians' self-reported hand hygiene performance. Apart from knowledge and self-efficacy, Sinkowitz-Cochran et al. (2012) added that staff engagement, overwhelmed/stress-chaos, and hospital leadership (Min, 2013) were three organizational factors found to be significantly associated with individual health care personnel knowledge, attitudes, and self-reported

hand hygiene practices.

The result confirmed with the previous study, managers' support and promotion of hand hygiene, alcohol-based hand rub availability at each point of care, displays of hand hygiene posters, education on hand hygiene, visible clear and simple instructions for hand hygiene, positive role modeling, and patient reminding healthcare workers to perform hand hygiene were found significant interventions to promote and improve hand hygiene practices in the hospital.

Furthermore, respondent believed that hand hygiene is a very high priority among the head department, colleague and patient in the institution. Interestingly, the study results reported that regular feedback was not an effective measures to encouraged respondents to comply with hand hygiene practices.

The result was unexpected since literatures have well documented the effectiveness of regular feedback in increasing the hand hygiene compliance such as the study of Pessoa-Silva et al. (2007) and Min (2013) who reported that performance feedback is effective in sustaining compliance improvement and is independently associated with infection risk reduction. The researcher speculated that the low perception about feedback can be attributed to the different cultural perception about feedback, since the hospital employs employee from a multicultural background and another factor could be the manner of delivering the feedback may play an important role.

Min (2013) suggested that education and role modeling at both the individual and organizational levels might be beneficial in improving hand hygiene compliance.

Al-Tawfiq, Abed, Al-Yami, and Birrer (2012) suggested that a multimodal approach using different strategies and intervention such as the WHO hand hygiene campaign (Allegranzi et al., 2013) promotes an institution-wide increase and sustained improvement in the rates of compliance.

Lastly, most respondent preferred alcohol based hand rub as the method of hand hygiene primarily because of the same reasons reported by the literatures such as: it requires less time , acts faster, more accessible than sinks, effective in reducing the number of microorganism, and skin issues were less common (Center for Disease Control, 2010).

In general, the study contributes to support the WHO hand hygiene campaign against HAND HYGIENE. The findings suggest that health care workers have a high level of awareness about HAND HYGIENEs and the importance of hand hygiene.

Furthermore, assessment of knowledge thru self-report is not enough to determine compliance of hand hygiene practices.

Observational studies are recommended. This is a small-scale project whose findings are difficult to be generalized because the researcher's respondents came from a single location, the use of a relatively small sample is a limitation of this research.

CONCLUSION

In conclusion, the respondents have a high level of knowledge about HAND HYGIENEs . Respondents were aware that HAND HYGIENE has an impact on patient outcome, hospitalized patient will likely develop HAND HYGIENE, and hand hygiene remains to be the single and most effective method against HAND HYGIENE. Respondents reported a high self-efficacy in performing hand hygiene. Organizational factors such as staff engagement, commitment of the department heads, and leadership were perceived to be significant in promoting hand hygiene practices. Strategies such as provision of access to hand hygiene facilities, guidelines, education and training, positive role modeling were effective. There was a low perception about the effectiveness of regular feedback.

Furthermore, observational studies are recommended to objectively measure hand hygiene compliance.

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