

EMPIRICAL REVIEW OF FOOD SAFETY TRAINING & CERTIFICATION (FOSTAC) PROGRAM ON CATERING SECTOR FOOD HANDLERS IN INDIA: A MIXED RESEARCH STUDY**¹Dr. Deepa Prasad Venkatraman and ²Puneet Basson**^{1,2}Research Scholar from Savitribai Phule Pune University¹deepaprasad.pumba@gmail.com and ²puneetbasson@gmail.com**ABSTRACT**

Safe food is the basic requirement for gaining trust of customers in the food industry. Food laws of the country provides the necessary guidelines to keep the food safe across the food chain. Scientific studies and committees formed by the governments make the guidelines to keep the food safe. Food safety trainings are done across the world to keep food handlers updated about the knowledge of keeping food safe. Food safety training in India is organized under Food Safety Training and Certification (FoSTaC) department of Food Safety and Standards Authority of India (FSSAI). This study assesses the impact of Food Safety Training on food Handlers working in catering sector of food industry. Data was collected from participants of food safety training and certification programs organized from January to November 2023. Quantitative data analysis was done through hypotheses testing and qualitative through expert interviews. The statistical analysis and expert opinion shows the significant positive impact of food safety training in the knowledge of food handlers. This study suggests the collaboration of all stakeholders for achieving the objectives of organized training under food safety training and certification.

Keywords: Food Safety Training and Certification, Food Handlers, Catering, Food Industry.

INTRODUCTION

Food is a need for all living beings but safe food is a need for human beings. Food prepared at home by trusted family members fulfils the need of safe food. To keep the trust for commercial establishments, food laws are framed by the government of the country. Food Safety and Standards Act, 2006 (FSSA, 2006) is the law governing food safety framework for Food Businesses working in India. This act was framed to engulf different laws relating to food industry into a single framework. Under this law, Food Safety and Standards Authority of India (FSSAI) was established for preparing scientific standards for food products to ensure availability of hygiene environment and safe food for human consumption. FSSAI releases the circular to regulate the manufacture, storage, distribution, sale and import of food products.

Food Safety and Standards Authority of India was formed under this act to provide Safe food to customers in India. This authority do the amendments in the law regularly as per the suggestion by the scientist's findings and experts committee meetings and reviews. Section 16 (3)(h) of the Food Safety and Standards Act 2006, gives the direction to FSSAI to provide training programmes in keeping the food hygienically Safe and environment around sanitized. These trainings are to be given to Food Business Operators (FBO), who are owners of the food business or to the food handlers working with FBO's. Food Safety Supervisor Training & Certification (FoSTaC) programme was initiated by FSSAI in July, 2017. Food safety supervisors (FSS), who are trained in good hygiene and sanitation practices should provide the knowledge to their colleagues and subordinates in their place of work. This is as per requirements written in the Schedule 4 of Food Safety and Standards Licensing and Registration Regulations, 2011. FoSTaC department is established to regularize the food safety supervisor training with the objective of providing training on food safety hygiene and sanitation to food business operators and food handlers.

Food Safety Supervisor Training Objectives:

1. Trained manpower on food safety hygiene and sanitation standards in the Indian food industry.
2. Improving the environment based on laws and rules for Food Businesses.
3. Behavioural change for safe food in the country.

International Journal of Applied Engineering & Technology

(<https://fostac.fssai.gov.in/about-fostac.jsp>)

Training manuals for various food industry sectors are prepared by team of scientists and industry experts from each sector to impart these trainings. Certificate presented to successful participants is called as 'Food Safety Supervisor' certificate. Various industry verticals for training are given in Table No.1 below.

Table No. 1

Trainings under FoSTaC			
Industry Vertical	Basic (4 hours)	Advance (8 hours)	Advance (12 hours)
<i>Catering</i>			
General & COVID	Yes	Yes	-
Integrated Child Development Services & COVID	Yes	-	-
Mid-Day Meal & COVID	Yes	-	-
Bakery Level 1 & COVID	Yes	-	-
<i>Manufacturing</i>			
General & COVID	-	Yes	-
Milk and Milk Products & COVID	-	-	Yes
Animal Meat and Meat Products & COVID	-	Yes	-
Poultry Meat and Meat Products & COVID	-	Yes	-
Fish and Fish Products & COVID	-	Yes	-
Packaged Water and Water Based Beverages & COVID	-	Yes	-
Bakery Level 2 & COVID	-	Yes	-
Edible Oils and Fats & COVID	-	Yes	-
Health Supplements and Nutraceuticals & COVID	-	Yes	-
Alcoholic Beverages & COVID	-	Yes	-
Organic Food Products & COVID	-	Yes	-
<i>Retail & Distribution</i>			
General & COVID	Yes	Yes	-
Point of Sale of Health Supplement & COVID	-	Yes	-
<i>Storage & Transport</i>			
Storage and Transport & COVID	Yes	Yes	-
<i>Awareness</i>			
Street Food Vending	Yes	-	-

(<https://fostac.fssai.gov.in/doc/pdf1.pdf>)

FoSTaC started trainings from the year 2017. During Covid-19, covid related standards for keeping food and food handlers safe are added to the training content. They have empanelled 'Training Partners' through selection process who are to coordinate for the implementation of food safety trainings. The industry experts who are certified through 'Training of Trainers' program can become trainer and assessor for the training. Training Partners work to schedule the day and date of the training in confirmation from food business operators, trainer and assessor. Schedule of the training is done through online form on FoSTaC website through training partner login. It need to be approved by the FoSTaC team as per the requirement policy of the training. For each training, a specific Training ID is generated. Participants for the training are food business operators, food handlers and

International Journal of Applied Engineering & Technology

people interested in joining or starting a food business. Participants need to register on the FoSTaC website and get their login and password created once in a lifetime. They need to enrol for the training through the login created and select the specific training. Trainee ID is created for each individual participant sitting for the training. Training is to be conducted with the proof of attendance, photographs and video of the training showing the trainer and participants. These proofs need to be uploaded by the assessor through his login ID. Assessor have to conduct test immediately after the training and fill the assessment sheet for result. Result is to be uploaded by the assessor with the proof of assessment sheet. Participants can download the certificate in their login if they pass the training. Feedback of the training is taken from the participants in their login before downloading the certificate. Validity of the certificate was for 2 years from the date of the training. After July 2022, validity of the certificate was removed till food handler changes the kind of food business or any changes in the Schedule IV of Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 [[https://fostacold.fssai.gov.in/fostac/doc/Order/Order/OM%20Removal%20of%20FSS%20certificate%20validity%20\(Bilingual\).pdf](https://fostacold.fssai.gov.in/fostac/doc/Order/Order/OM%20Removal%20of%20FSS%20certificate%20validity%20(Bilingual).pdf)].

Food Safety training is mandatory for food handlers in developed countries. Details for few developed countries are given in the table no. 2 below.

Table No. 2

Country	Food Safety Agency	Certificate	Level of Courses	Course Duration	Certificate Validity	Mode of Training	Content Delivery	Exam	Passing Standard
Canada	Canadian Food Inspection Agency (CFIA)	Food Handler Certificate	Basic - Employee level/ Advanced - Manager level	8 hrs	5 years	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	50 MCQ's in 60 minutes	Above 70% marks
European Union	European Food Safety Authority (EFSA)	Food Hygiene Certificate	Level 2 - For workers (not mandatory)/ Level-3 - For supervisors and above designations (Mandatory)	8 hrs	No expiry, but should do refresher training once after 4 years.	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	30 MCQ's in 45 minutes	Above 70% marks
India	Food Safety and Standards Authority of India (FSSAI)	Food Safety Supervisor	Basic - Employee level/ Advanced - Manager level	8 hrs	2 years	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	20 MCQ's in 20 minutes	Above 70% marks

International Journal of Applied Engineering & Technology

UK	Food Standards Agency (FSA)	Food Hygiene	Level 2 - For workers (not mandatory)/ Level-3 - For supervisors and above designations (Mandatory)	8 hrs	No expiry, but should do refresher training once after 3 years.	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	30 MCQ's in 45 minutes	20 questions to be correct which means above 66.66% marks
USA	Food & Drug Administration (FDA)	Food Safety Hygiene Certificate	Level 1 - food handlers not in direct contact with food/ Level 2 - food handlers in direct contact with food/ Level 3 - Supervisor and above designations	8 hrs	5 years	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	40 MCQ's in 60 minutes	30 questions to be correct which means above 75% marks
Australia & New Zealand	Food Standards Australia & New Zealand	Food Handling Certificate/ Food Safety Supervisor Certificate	Food Handling certificate - for workers (not mandatory)/ Food Safety Supervisor - for food business operators (Mandatory)	6 hrs	5 years	Offline/ Online	Lecture through PPT slides and handouts/ PPT slides, Audio Narration and handouts	30 MCQ's in 45 minutes	Above 90% marks

(Source – Individual Government websites)

Developed countries are following the food safety training for food handlers from many decades. Format of training in India is based on study of these developed countries model of training. Online and offline, both means are used for the training. Difference between training in India with developed countries is that each food handler have to pass this training in developed countries versus 01 out of 25 food handlers of a food business need to get certified in India. In India, Certified staff should teach the learning from the training to colleagues and subordinates in the company.

LITERATURE REVIEW

Hygiene and sanitation is most important for food handlers. It is of 2 types – Personal and Surrounding. For personal hygiene, support is required by food handlers from food business operators. One study indicate that a number of factors are related to hand hygiene practices and support those who have suggested that food worker hand hygiene improvement requires more than the provision of food safety education. Instead, improvement programs must be multidimensional and address additional factors like activity type, worker busyness, number and location of hand sinks, availability of supplies (e.g., gloves, soap, towels), restaurant ownership, and the relationship between prevention methods (i.e., glove use and hand washing). (Green Et Al., Journal of Food

International Journal of Applied Engineering & Technology

Protection, Vol. 70, No. 3, 2007). Provisions to be provided by food establishment management for food safety practices to be followed by food handlers. Regular sanitary inspection can improve adherence of food handlers to personal hygiene and food safety practices. Awards/incentives to the workers for encouragement may be planned (Mukhopadhyay P et al, Al Ameen J Med Sci; Volume 5, No.1, 2012). Internal and external Hygiene audits are to be done regularly and best hygiene food handler to be rewarded. Preparation of meals long before their consumption and storing them at ambient temperature were identified as key factors in the handling of meals that contribute to food poisoning (Mulugeta K. et al, Ethiop J Health Sci. Vol. 22, No. 1, March 2012). Receiving, storing and checking provisions to be built into infrastructure for smooth and uni-directional flow of food in the food premises. Studies showed that knowledge and behavior are significantly increased post training in areas that are relatable or areas that they have had repeated exposure, such as hand washing (Husain et al., 2016, Roberts et al., 2008). Study also shows that observational studies provide genuine results than those based off self-reported behavior of food safety practices by food handlers (Park, Kwak, & Chang, 2010).

The research showed that scores from the knowledge test increased significantly after training. Specifically, sections on personal hygiene and handling food showed significant improvements. This study showed that even though no significant changes in behavior were detected, there was still value in training. Because of the significant increase in knowledge, refresher training would be highly valuable. (McFarland et al., 2019). Behavior-based training has shown to be more effective than knowledge-based training at retaining knowledge and improving employee food safety behaviour (Yu et al., 2018). This and other studies suggested that mandatory certification for both managers and employees can help the improvement on food safety inspection reports (Murphy et al., 2011). Behavior has the potential to be improved through regular refreshing trainings. This gives food handlers repeated exposure and more opportunities to update, rehearse, and perfect learned skills (Soon, Baines, & Seaman, 2012).

OBJECTIVE OF THE STUDY

Food safety practices are followed if food handlers are trained through organized trainings. FoSTaC is providing the food safety supervisor training to each food industry vertical from 2017. Objective of this study is to find out gap between the knowledge required and actual knowledge of food safety among food handlers in India and to identify whether Food safety trainings under FoSTaC program is fulfilling the gap. To identify the factors influencing the decision of food business operators to send food handlers for food safety training. Objectives of this study is formulated into three hypothesis. Tool used for this to collect data for statistical analysis is structured questionnaire. First objective converted into hypothesis is to find the gap of food safety knowledge among food handlers in India. Second objective converted into hypothesis is to identify the fulfilment of food safety knowledge gap through the food safety training. Third objective converted into hypothesis is comparison of the expectations from the training and expectations met from the training. Frequency of the training is once for food handlers. Majority of the developed countries follow the refresher training in one, two, three or four years. Fourth objective is to find out the requirement of food safety training from food handlers.

METHODOLOGY

In this pilot study, data is collected from 343 participants of the catering sector food safety supervisor trainings under FoSTaC (Food Safety Training & Certification) in India. Data is collected from the offline food safety trainings conducted between the months of January to October 2023. Participants are from the catering sector and data is collected before and after the training. Questionnaire is circulated before the training to collect data related to demographics, Likert scale for frequency, expectations and expectations met from the training. In the same questionnaire, a section of food safety & hygiene related multiple choice questions were asked to know about their food safety hygiene and sanitation knowledge from the catering manual of food safety supervisor training. After the training, food safety multiple choice questionnaire was given to assess the level of food safety hygiene and sanitation knowledge gained from the training.

Results & Discussion – Quantitative Analysis

Data Reliability Test used is Cronbach's Alpha and the value derived is 0.83, which is considered good for internal consistency of the data collected.

Quantitative Analysis**Hypothesis 1:**

H_0 (Null Hypothesis) – Gap is not identified in the knowledge of food handlers to keep food safe, hygiene and sanitized.

H_1 (Alternate Hypothesis) – Gap is identified in the knowledge of food handlers to keep food safe, hygiene and sanitized.

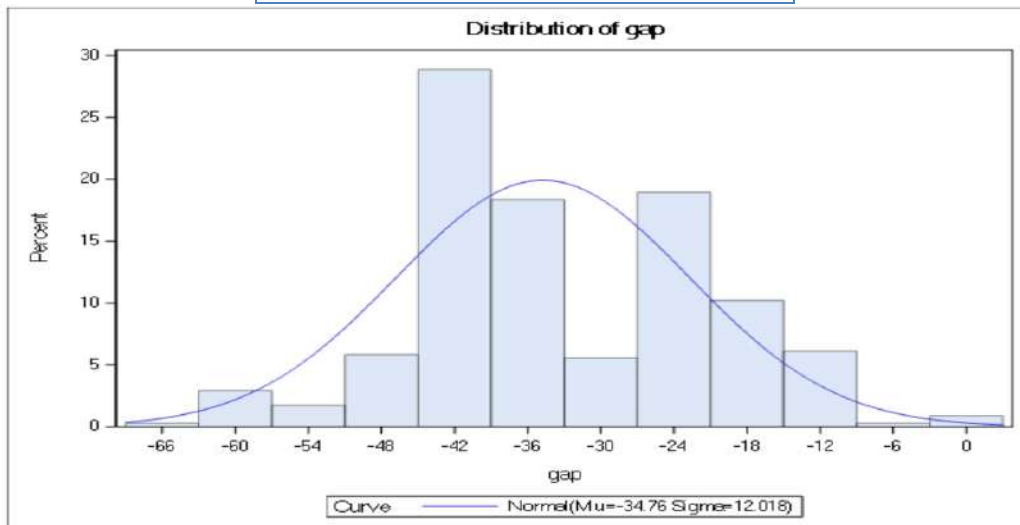
To pass the Food Safety Supervisor Training & Certification program (FoSTaC), participant should score minimum of 70 marks out of 100 for the test taken immediately after the training by the assessor. To test Hypothesis 1, food safety hygiene and sanitation knowledge of the participant is to be checked before the training. If participant passes the test before the training by scoring more than 70 marks out of 100, that food handler is not having gap in food safety hygiene and sanitation knowledge. Formula for hypothesis 1 testing is made based on participant's score of before training test and eligibility minimum score of 70 out of 100.

Therefore, formula for hypothesis is to be framed for statistical analysis, i.e.

H_0 (Null Hypothesis) – Gap is not identified in the knowledge of food handlers to keep food safe, hygiene and sanitized. : {Before training test score - 70 \geq 0 (mean of before training test score \geq 70)}

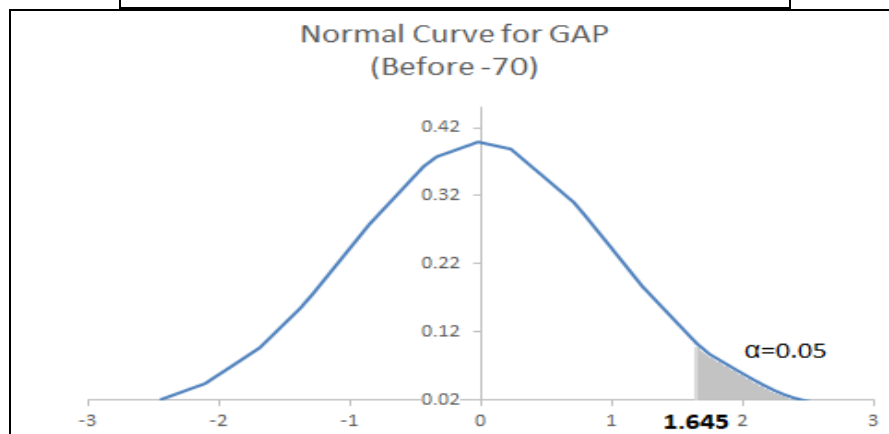
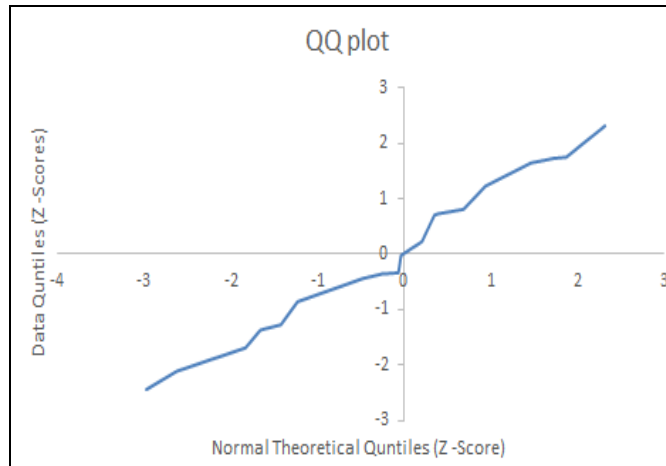
H_1 (Alternate Hypothesis) – Gap is identified in the knowledge of food handlers to keep food safe, hygiene and sanitized. : {Before training test score - 70 $<$ 0 (mean of before score $<$ 70)}

Descriptive Statistics for Gap (Before-70)	
N	343
Mean	-34.7631
Median	-35
Mode	-45 > Mean, Median
Std Deviation	12.01812
Variance	144.4351
Skewness	0.152068
Kurtosis	-0.43914



Tests for Normality:

H_0 : Gap (Before -70) is followed a normal distribution VS H_1 : Gap (Before -70) is not followed normal distribution



Test for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.967459	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.12507	Pr > D	<0.0100

Shapiro-Wilk tells to reject H_0 (p-Value < 0.05) i.e. Gap (Before -70) is not following a normal distribution. Therefore, we have to use Non-Parametric test:

Tests for Location: $\mu_0=0$				
Test	Statistic		p Value	
Student's t	t	-53.571	Pr > t	<.0001
Sign	M	-171	Pr >= M	<.0001
Signed Rank	S	-29326.5	Pr >= S	<.0001

From Signed Rank test: p-Value < 0.05, therefore reject H_0 and accept the alternate hypothesis.

International Journal of Applied Engineering & Technology

From this we conclude to have sufficient evidence to say that the Gap (before score - 70) < 0 i.e. Gap is identified in the knowledge of food handlers to keep food safe, hygiene and sanitized. Gap in the knowledge of food handlers to keep food safe, hygiene and sanitized is the reason for organizing the FoSTaC program and which is proven through Hypothesis 1 testing.

Hypothesis 2:

H₀ (Null Hypothesis) – Training has no impact in the knowledge of food handlers to keep food safe, hygiene and sanitized.

H₁ (Alternate Hypothesis) – Training has impact in the knowledge of food handlers to keep food safe, hygiene and sanitized.

To test Hypothesis 2, before training test score and after training test score is to be used for calculation. Formula is to be made for null and alternate hypothesis testing. Difference between before and after training test score and use of statistical tools will provide the analysis for the interpretation.

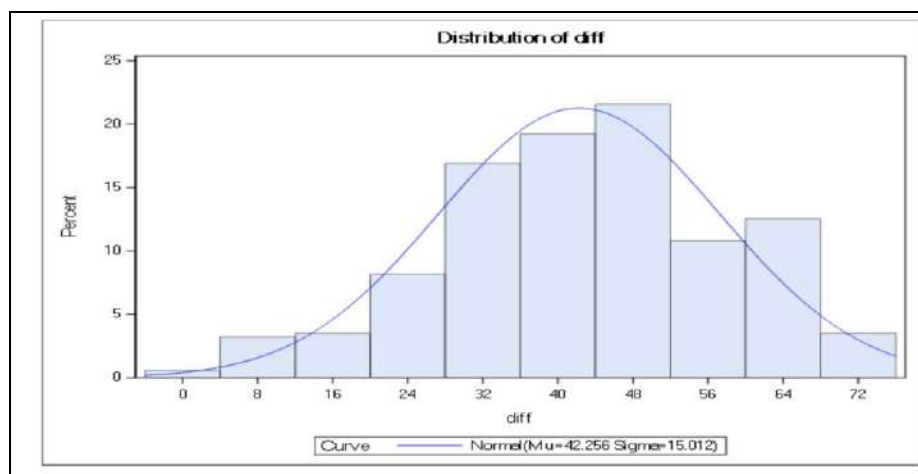
H₀ – Training has no impact in the knowledge of food handlers to keep food safe, hygiene and sanitized.

Difference in Score ≤ 0 i.e. Diff ≤ 0 i.e. After Training Test Score – Before Training Test Score ≤ 0

H₁ – Training has impact in the knowledge of food handlers to keep food safe, hygiene and sanitized.

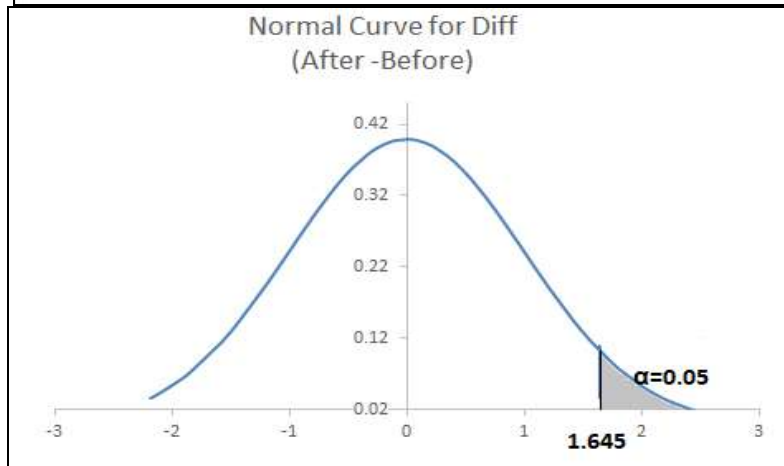
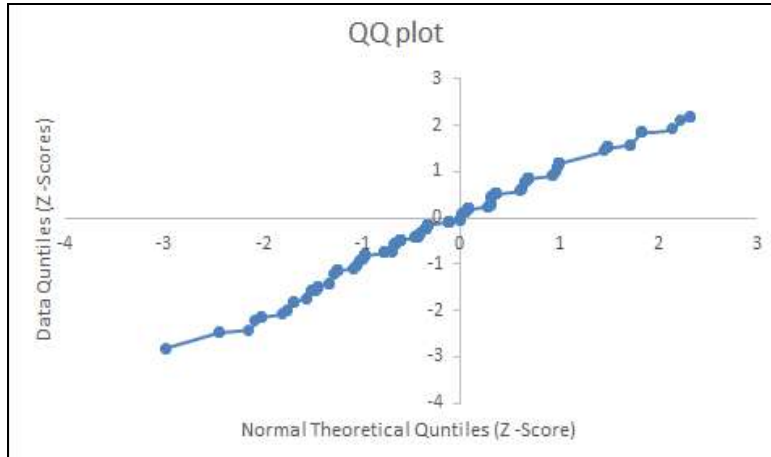
Difference in Score > 0 i.e. Diff > 0 i.e. After Training Test Score – Before Training Test Score > 0

Descriptive Statistics for Diff (After Score – Before Score)	
N	343
Mean	42.255
Median	41.25
Mode	60 > Mean , Median
Std Deviation	15.012
Variance	225.374
Skewness	-0.291
Kurtosis	-0.1052



Tests for Normality:

H_0 : Diff (After-Before) is followed a normal distribution VS H_1 : Diff (After-Before) is not followed normal distribution



Test for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.986522	Pr < W	0.0028
Kolmogorov-Smirnov	D	0.070016	Pr > D	<0.0100

Shapiro-Wilk tells to reject H_0 (p -value = 0.0028 < 0.05) i.e. Difference (After - Before) is not following a normal distribution. We have to use Non-Parametric test:

Tests for Location: $\mu_0=0$				
Test	Statistic		p Value	
Student's t	t	52.12922	$Pr > t $	<.0001
Sign	M	170.5	$Pr \geq M $	<.0001
Signed Rank	S	29155.5	$Pr \geq S $	<.0001

From Singed Rank test: p-Value < 0.05, therefore reject H_0 and accept alternate hypothesis.

From this we conclude to have sufficient evidence to say that the Difference > 0 i.e. Training has impact in the knowledge of food handlers to keep food safe, hygiene and sanitized.

Interpretation: Gap is present in the knowledge of food handlers to keep food safe, hygiene and sanitized as proven from Hypothesis 1 testing. FoSTaC program is having positive impact in the knowledge of food handlers to keep food safe, hygiene and sanitized is proven through hypothesis 2 testing. Therefore, food safety supervisor training is achieving objectives of FoSTaC. (<https://fostac.fssai.gov.in/about-fostac.jsp>)

Hypothesis 3: ‘Expectations from Training’ and ‘Expectations Met from training’ of Food Handlers from Food Safety Training

Five dependent variables are selected to check the relationship with food safety training (independent variable). Dependent variables are:

- 1.) Food safety hygiene and sanitation knowledge
- 2.) Certificate
- 3.) To be aware of changes in the food laws
- 4.) Change from regular work
- 5.) To meet industry members

Calculated & Tabulated Chi-Square is derived for comparison and P-value calculation for significance in the below chart:

Hypothesis 3:	Calculated Chi-Square	Tabulated Chi-Square	P-value	Result
H_0 : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Food safety hygiene and sanitation knowledge] are independent (no relation) H_1 : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Food safety hygiene and sanitation knowledge] are dependent (Relation)	54.0672	44.985	0.00005	Reject H_0
H_0 : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Certificate]	58.457	44.985	0.00007	Reject H_0

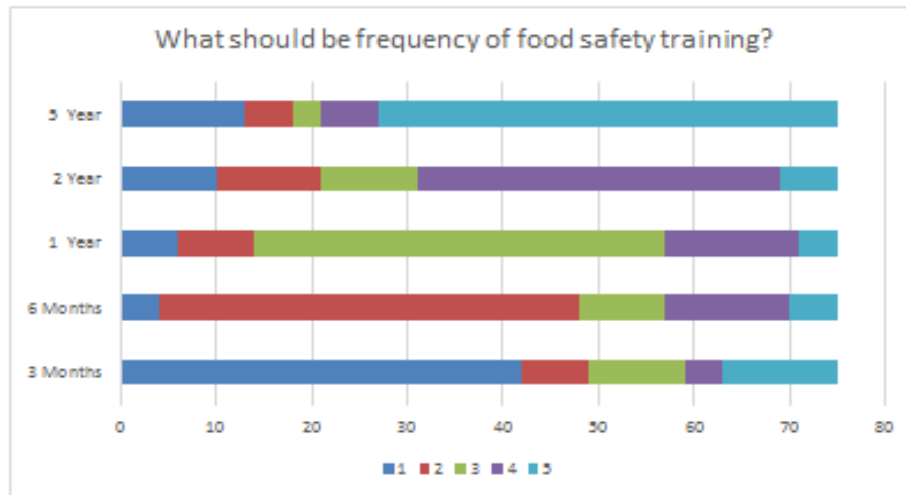
International Journal of Applied Engineering & Technology

are independent (no relation) H ₁ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Certificate] are dependent (Relation)				
H ₀ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [To be aware of changes in the food laws] are independent (no relation) H ₁ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [To be aware of changes in the food laws] are dependent (Relation)	46.1623	44.985	0.0002	Reject H ₀
H ₀ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Change from regular work] are independent (no relation) H ₁ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [Change from regular work] are dependent (Relation)	45.825	44.985	0.0068	Reject H ₀
H ₀ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [To meet industry members] are independent (no relation) H ₁ : Expectations from the food safety supervisor training and Expectations Met from the food safety supervisor training [To meet industry members] are dependent (Relation)	42.812	44.985	0.0009	This is critical to decide; Since Calculated Chi-Square is < Tabulated T, but p value is < 0.05. Accept H ₀ .

Interpretation: All the dependent variables are highly significant except the last one in the table above. P-value for all dependent variables are below 0.05 which means food safety training is meeting the expectations of the participants.

Frequency of Food Safety Training

Question was asked to participants for the frequency required for this training. Answer to be given was in Likert scale for options from '3 months' to '5 year' in the rank of 1 to 5. Below chart no. 4 is for the frequency of food safety supervisor training desired by food handlers.



Interpretation: Most Food handlers accept the frequency of the training to be kept within 2 years as was the case before July 2022. FoSTaC department and food business operators are informed to sit for discussion again and review the policy of removing the validity of food safety training certificate.

CONCLUSION

This study identified the gap in the knowledge of food handlers to keep food safe, hygiene and sanitized in India. The gap is filled by FoSTaC program is proven through this study in quantitative and qualitative analysis. Experts have divided the catering sector into registered and unregistered. Food safety supervisor training is demanded by Food Business Operator (FBO) from registered catering sector only. For registered catering sector, experts confirm significant increase in the knowledge of food handlers to keep food safe, hygiene and sanitized. Food Business Operator's primary objective of food safety supervisor training for food handlers is to get certificate as legal requirement and knowledge is the secondary objective as highlighted through qualitative analysis. Food safety training is proving to be a motivator for learning about food laws and ways to implementation in catering operations by food handlers. Food handler's feedback and experts view is of keeping the food safety training at regular intervals. This study suggests to reintroduce food safety certification time validity. Fixed interval training helps food handlers in revising the food safety hygiene and sanitation knowledge and also informs about changes or modification in the food laws. This study proves that the format of the training is successful in the current format. In developed countries, each food handler has to go through this training before joining the food industry. In India, FoSTaC training is for 1 out of 25 food handlers in a food establishment. This needs to be made comparable to developed countries for making it inclusive for every food handler.

LIMITATIONS

This pilot study was limited geographically as the data collected was from the offline trainings conducted in the western states of India. Suggestion is to conduct study at pan India level and from online trainings too. Various other food industry verticals should be included in the future studies to enlarge the scope. More stakeholders of this food safety training eco-system like food safety officers, trainers, assessors and training partners can be included in the future studies for their expert view and understanding on this subject.

REFERENCES

1. Clayton, D. (2004). Understanding and predicting FBO's and FH's' implementation of specific food safety practices using social cognition models (Doctoral dissertation, Cardiff Metropolitan University).
2. Yu, H., Neal, J., Dawson, M., & Madera, J. (2018). Implementation of behavior-based training can improve food service employees' handwashing frequencies, duration, and effectiveness. *Cornell Hospitality Quarterly*, 59(1), 70–77.

3. Roberts, K. R., Barrett, B. B., Howells, A. D., Shanklin, C. W., Pilling, V. K., & Brannon, L. A. (2008). Food safety training and foodservice employees' knowledge and behavior. *Food Protection Trends*, 28(4), 252–260.
4. Green, L. R., Radke, V., Mason, R., Bushnell, L., Reimann, D. W., Mack, J. C., ... & Selman, C. A. (2007). Factors related to food worker hand hygiene practices. *Journal of food protection*, 70(3), 661-666.
5. Husain, N. R. N., Muda, W. M. W., Jamil, N. I. N., Hanafi, N. N. N., & Rahman, R. A. (2016). Effect of food safety training on FBO's and FH's' knowledge and practices. *British Food Journal*.
6. Park, S., Kwak, T., & Chang, H. (2010). Evaluation of the food safety training for food handlers in restaurant operations. *Nutrition Research and Practice*, 4(1), 58–68.
7. Murphy, K. S., Dipietro, R. B., Kock, G., & Lee, J. (2011). Does mandatory food safety training and certification for restaurant employees improve inspection outcomes. *International Journal of Hospitality Management*, 30(1), 150–156.
8. Soon, J., Baines, R., & Seaman, P. (2012). Meta-analysis of food safety training on hand hygiene knowledge and attitudes among food handlers. *Journal of Food Protection*, 75(4), 793–804.
9. McFarland, P., Checinska Sielaff, A., Rasco, B. and Smith, S. (2019), Efficacy of Food Safety Training in Commercial Food Service. *Journal of Food Science*, 84: 1239-1246. <https://doi.org/10.1111/1750-3841.14628>
10. Ismail, F. H., Chik, C. T., Muhammad, R., & Yusoff, N. M. (2016). Food safety knowledge and personal hygiene practices amongst mobile FBO's and FH's in Shah Alam, Selangor. *Procedia-Social and Behavioral Sciences*, 222(2016), 290-298.
11. Joseph, A. (2018). Practice of food safety among restaurant workers in Chennai and the impact of an awareness programme on their knowledge of food safety. *International Journal of Home Science*, 4(1), 274-277.
12. Lazou, T., Georgiadis, M., Pentieva, K., McKeivitt, A., & Iossifidou, E. (2012). Food safety knowledge and food-handling practices of Greek university students: A questionnaire-based survey. *Food Control*, 28(2), 400-411.
13. Lee, K. E., & Ryu, K. (2004). Influences of school food service employees' food safety training on food safety knowledge and practices. *Korean J Community Nutr*, 9(5), 597.
14. Manes, M., Kuganatham, P., Jagadeesan, M., Laxmidevi, M., & Dworkin, M. (2016). A Step Towards Improving Food Safety in India: Determining Baseline Knowledge and Behaviors Among Restaurant Food Handlers in Chennai. *Journal of Environmental Health*, 78(6), 18-25.
15. Ovca, A., Jevšnik, M., & Raspor, P. (2014). Food safety awareness, knowledge and practices among students in Slovenia. *Food Control*, 42, 144-151.
16. Shukla, S., Singh, S.P. and Shankar, R. (2018), Food safety assessment in India: modelling enablers, Benchmarking: An International Journal, Vol. 25 No. 7, pp. 2478-2495.
17. Siau, A. M. F., Son, R., Mohhiddin, O., Toh, P. S., & Chai, L. C. (2015). Food court hygiene assessment and food safety knowledge, attitudes and practices of FBO's and FH's in Putrajaya. *International Food Research Journal*, 22(5), 1843.
18. Zanin, L. M., da Cunha, D. T., de Rosso, V. V., Capriles, V. D., & Stedefeldt, E. (2017). Knowledge, attitudes and practices of FBO's and FH's in food safety: An integrative review. *Food Research International*, 100, 53-62.