

A Rapid Assessment of Food and Sanitary Practices of Pilgrims Visiting Kotappakondaon Mahasivaratri in Guntur District, Andhra Pradesh, India

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Abstract: ***Introduction:** Mela' meaning 'fair' or 'gathering' and the pilgrims include religious and holy men and women from different sections of population. The government has to manage prior planning a needs to manage thousands of pilgrims arriving from all across the Districts, States. The logistics of the water, sanitation, security, food and health, needs for meticulous planning and quick responses. **Objectives:** 1. To review the food, refreshments and water arrangements for the pilgrims attending the Kotappakonda on Mahasivaratri. 2. To determine the sanitary precautions were taken to maintain cleanliness and hygiene in the premises of temple, on hilly area and below the hilly area. **Methodology:** An Epidemiological survey was conducted on the day of MahaShivaratri, above the hilly area and also surrounding nearby village areas of Kotappakonda Lord Shiva temple, which is nearest to Narsaraopeta Tashil of Guntur District, Andhra Pradesh. Twenty Medical students and two faculty members and two health staff of the institute were trained for more than two days and they were explained about each and every question of the questionnaire Food and refreshment arrangements like availability of freshly prepared food at food stalls proper coverage of foods and also method of disposal of remaining food; availability of bathrooms and toilets, whether they were clean or not, permanent or makeshift, availability of water details were also assessed. **Results:** Out of total 187 inspections in 18.7% places food was properly covered at the stalls. 28.8% of the pilgrims were used the dustbins for disposing the leftover food and the remaining 72.2% dumped the food on road side. 54% study participants mentioned that hotel food was fresh, as per 48.1% public observation it was tasty. Only 36.9% pilgrims' expressed that this food was hygienic. 68.4% of bath rooms were clean and 76.4% of them have proper water availability. It was observed that 63% of pilgrims were satisfied with Sanitary measures and 37% were not satisfied with these arrangements of toilets. **Conclusions:** Fresh, hygienic, tasty and properly covered food need to be available either at food stalls or Free Food Distribution places. Proper waste disposal system need to be established and sufficient number of dustbins can be placed in different areas. Good numbers of makeshift toilets need to be placed during Mahashivaratri above and below the hilly areas*

Keywords: Mela, Sanitation, Food hygiene, make shift toilets, Pilgrims, disposal, dustbins, Kotappakonda

1. Introduction

According to the World Health Organization (WHO), a mass gathering is "any occasion, either organized or spontaneous, that attracts sufficient numbers of people to strain the planning and response resources of the community, city or nation hosting the event".¹ A mass gathering often brings together organizations that has never worked together. It is very essential to establish excellent coordination and communication system between different organizing groups. A proper understanding, planning, timely risk assessment and proper resource utilization can make any event most successful.²

The government has to manage prior planning and address the needs of the lakhs of public arriving from all across the Districts, as well as ensure the prevention of the spread of diseases, addressing the management of health systems and other basic services like food, transportation, and safety. The

logistics of the water, sanitation, security, food and health, a needs for meticulous planning and quick responses. The World Health Organization (WHO) defines a mass gathering as a "gathering of more than a specified number of persons at a definite location for a specific purpose for a defined period of time". The number of persons may be as few as 1000, but the available literature suggests that gatherings exceeding 25, 000 persons are considered to be a mass gathering.³

The magnitude of the mass gatherings poses a significant public health problems including exposure to extreme weather, infectious diseases, water-, sanitation-, food problems, and hygiene-related illness, and epidemic outbreaks.⁴ India is a country of many religions, faiths, festivals and events and there are mass gathering events being organized at various levels involving large number of people.⁵ In such situations, governments and administration seem to be struggling to make proof arrangements and there

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were some good practices adopted by governments in organizing such events.

Special attention is needed in relation to disease surveillance, infection control, and water and sanitation.³ Given an example that the region in which the Allahabad KumbhMela is held is among the most under-developed of India, with an inadequate health infrastructure,⁷ It is necessary that proper medical arrangements should be made by the authorities and there should be arrangement for medical inspection in food stalls and checking of sanitary measures. Potter's work in KumhMela had revealed some of the common challenges involved in attempts to provide camp residents with safe and functional sanitation resources, lack of accountability for officials, lack of sewage infrastructure resulting in open sewage drains, chronically unfinished or non-functioning toilet facilities, lack of perceived safety for women and children.⁸ There are various problems involved in the management of events such as Hajj due to the movement and residence of such large crowds.⁹ Food contamination can occur at any point in its journey from the producer to the consumer.¹⁰

Food handlers are the most important sources for the transfer of micro-organisms to the food and serving such food.^{11, 12} They play major role in ensuring food safety throughout the chain of production, processing, storage, preparation and serving of food. The chances of food being contaminated depend largely on the health status of food handlers, their hygiene, their knowledge, attitudes and practices.¹³ This is especially important in Melas, where the number of food consumers runs into lakhs per day and there is volume preparation and processing of food due to which the risk of food -borne disease outbreaks is very high.

Kotappakonda is a holy hill, is located 10 miles from Narasaraopet city and 25 miles south west of Guntur City Andhra Pradesh. This hill appears with 3 peaks in any direction so it's also called as Trikutadri, Trikuta Parvatham. The epigraphs at Kotappakonda clearly state that the deity established in the shape of Sivalinga on the hill top is known as Trikuteswara or Trikoteswara. This Shiva temple is located on the mountain and is one of the largest temples in the Guntur district of Andhra Pradesh. Mahasivarathri is the main festival observed here, and Devotees from the surrounding villages carried as many as 'prabhas', which were over 40 feet tall, mounted on tractor trailers. The hill shrine reverberated with the chants *haraharamahadeva*. With almost 15 lac people gathering in Dhanuyatra in Orissa an area of less than 15 square kilometers, it becomes difficult for the organizers to take care of the needs of every single citizen.¹⁴ The local administration has already initiated large number of measures to ensure a festival with its best possible atmosphere in all respects.

The United Nations (UN) and the World Health Organization (WHO) consider sanitation essential to health. In 2010, the United Nations General Assembly recognized access to sanitation and drinking water as a fundamental human right. Low-cost improvements could yield high benefits: a joint World Health Organization/UNICEF 2010 study estimated that for every dollar spent on sanitation, one

could expect a \$34 return in life quality and health.¹⁵ The term "Sanitation" not only refers to construction of latrines but it also includes the whole field of managing the living environment with a view to prevent diseases and promote health.¹⁶ Sanitation barrier includes construction of latrines and personal hygiene and proper sanitation not improves health.¹⁷ In spite of all the challenges, adequate planning was done to meet the requirements in most areas like water supply, sanitation and food arrangements.

Keeping view of all the challenges and hurdles at Kotappakonda on Mahasivaratri festival a research study was planned and conducted to review the food, refreshments and water arrangements for the pilgrims and also to determine the sanitary precautions were taken to maintain cleanliness and hygiene in the premises of temple, on hilly area and below the hilly area.

2. Methodology

An Epidemiological survey was conducted on the day of MahaShivaratri, above the hilly area and also surrounding nearby village areas of Kotappakonda Lord Shiva temple, which is nearest to Narsaraopeta Tashil of Guntur District, Andhra Pradesh. Permission was also taken from all the relevant authorities and government officials before starting a study. After getting approval from the Director of Rajiv Gandhi Institute of Medical Sciences (RIMS) Ongole, Prakasam District the team lead by Assistant Professor of Community Medicine along with the Lecturers in Medical social sciences and Health Extension Officer and also second year Medical undergraduate MBBS students visited Kotappakonda and surrounding areas. This study was planned and conducted over a period of one week from 9feb 2018 to 15 feb 2018

A structured proforma cum questionnaire was used to collect information on food and water arrangements and also sanitary measures were taken in this Maha Sivaratri Festival at Kotappakonda. Twenty Medical students and two faculty members and two health staff of the institute were trained for more than two days and they were explained about each and every question of the questionnaire. All the components in the form explained in the detailed way and clarifications were given for their doubts and queries. Mock exercises were also conducted regarding way of asking questions, their communication and interviewer skills were also tested well in advance.

This questionnaire has both observation and interview aspects and consists of questions on food arrangements and sanitation measures separately. Questions related to food and refreshment arrangements asked in this were availability of freshly prepared food at food stalls, proper coverage of foods, availability of tinned foods, presence of baby foods like milk, ceralac, homely cooked food, cooking the food at festival, method of disposal of remaining food and various facilities regarding foods. Interview was also done at food line queues about neat food items, process of preparation, how the food being served and type of food they are serving. Questions related to sanitation were enquired on availability of bathrooms and toilets, whether they were clean or not, permanent or makeshift, availability of water, free or paid,

separate for males and females, avoidance outside open places, presence and use of dustbins, and satisfaction with the arrangements.

One Male and one female police supporting staff from the Superintendent of Police Prakasam District accompanied us from Ongole to Kotappakonda till the completion of the study.

Informed consent was taken from all the study participants before asking questions a detailed interview were carried out with all the participants. The police team informed to police outpost and police control room which were established on the hill of Kotappakonda. They were explained about our plan and purpose of visit and we also seek their support while interviewing with the pilgrims.

In Initial phase we observed areas then interview was done on hill top temple area followed by below the hilly area and surrounding places. Details were taken regarding food and refreshments arrangements and sanitary status in both the areas then enquiry was conducted with pilgrims standing in food lines. We trained total students and one was unable to attend due to genuine reasons each student filled 10 forms a total of 190 forms were filled but there were three incomplete forms, so finally analysis was done for 187 observations and 187 interviews. Accompanying faculty members and also health staff ensured the quality in filling of forms by medical students. Medical students were also asked to collect opinions, views and suggestions from the pilgrims on separate paper about food and sanitation measures and views regarding arrangements. All the forms were collected from the students and placed in a secured place under lock and key. Excel and SPSS 20.0 versions were used for entering the data and analysis was done for all continuous and discrete variables.

3. Results

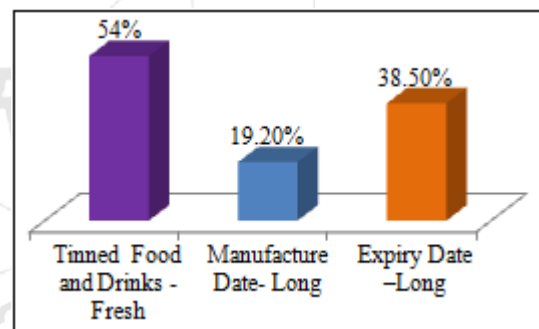
There were various small and large food stalls were present above and below the hilly areas and shop numbering was not done in either of the places. Out of total 187 inspections, 68% inspections by Medical students noticed that food and refreshments were properly prepared in the stalls and only

34.2% of the food was hygienic and only 18.7% places food was properly covered at the stalls. More than 79% of inspections revealed that baby foods are not available in the premises of Kotappakonda hilly area.

Table 1: Observation Food and Refreshments at Kotappakonda on MahaShivaratri

S.No	Food and Refreshments (N=187 Observations)	Yes	Percentage
1	Food properly prepared in stalls	128	68.4%
2	Hygienic	64	34.2%
3	Properly Covered	35	18.7%
4	Baby foods not Available	149	79.7%
5	Milk not Available	134	71.6%
6	Ceralac not Available	154	82.3%
7	Non Spicy Fresh food	80	42.8%
8	Own Preparation - Preparing at Mela	65	34.5%
9	Dispose of remaining food or leftover food- Dustbins	54	28.8%
10	Dispose of remaining food or leftover food- Dump	133	72.2%

Only 42% inspections noticed the availability of non spicy fresh food and 34.5% of the people are preparing food at Mahasivaratri festival, only 28.8% of the pilgrims were used the dustbins for disposing the leftover food and the remaining 72.2% dumped the food on road side and also on the street due to lack of sufficient dustbins above and below the Kotappakonda hill (Table-1) About 54% were noticed that tinned foods and drink were fresh and long manufacture date found in 19.2% cases. Long expiry date observed among 38.5% of these foods in the shops and stalls (Graph-1)



Graph 1: Status of Tinned foods and Drinks on Observation



Figure 1: Free distribution of food to the Pilgrims and Dumping the Food and not using Dustbins

Based on interview by medical students only 14.4% pilgrims were bringing the food from their homes and 64.7% of the public visiting the Kotappakonda are buying food from hotels. About 54% mentioned that this hotel food was fresh, as per 48.1% public observation it was tasty. Only 36.9% pilgrims' expressed that this food was hygienic and 30.5% mentioned that food was properly covered. More than 60.7% mentioned that food was served by plates (Table-2)

Table 2: Food and refreshments Interview of pilgrims at Kotappakonda on Mahasivaratri

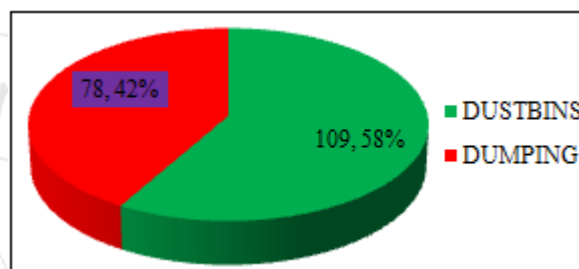
S.No	Food and Refreshments (N=187)	Yes	Percentage
1	Did you get the food prepared at home?	27	14.4%
2	Did you buy the food in the stalls or hotels?	121	64.7%
3	Fresh Food	101	54%
4	Tasty	90	48.1%
5	Hygienic	69	36.9%
6	Properly Covered	57	30.5%
7	Properly Served	69	36.9%
8	Serving by Plates	112	60.7%
9	Tinned food- Did you see the manufacture and expiry date	72	38.5%
10	Properly Preserved	97	51.9%
11	Baby Food- Any baby food available	13	6.9%

More than 44% pilgrims revealed that food items are neat in where they are standing in lines and collecting foods from free food distribution centers. About 43% expressed that food is unhygienic. Among the total study participants 16.5% did not consume food in the food lines and 62% of the pilgrims received food through plates and 17.1% received food through papers (Table-3)

Table 3: Food lines (Queues) Interview at Kotappakonda on MahaShivaratri

S.No	Food Lines (N=187)	Number	Percentage
1	Food Items are Neat -Yes	83	44.4%
2	Not consumed in Food Lines	81	43.4%
3	Preparations- Hygienic	71	37.9%
4	Preparations- Unhygienic	80	42.8%
	Not consumed in Food Lines	36	19.3%
5	Serving of Foods-Plates	116	62%
6	Serving of Foods-Papers	32	17.1%
7	Serving of Foods-Leaves	10	5.3%
	By Hand	2	1%
	Not consumed in Food Lines	29	14.5%

It was noticed that 42% of leftover food was dumping along and sides of the roads and 58 % of pilgrims were thrown in the dustbins where food was collected by standing in lines at free food distribution centers (Graph-2).



Graph 2: Disposal of leftover food at Food Lines



Figure 2: Medical student observing uncovered cut pieces of Water melon

Even though arrangements made for disposal of wastes still these were not as per standards and more use of plastic covers and packed waters which is main threat to

environment. There is less use of dustbins in the Mela and dumped used water packets n the ground.

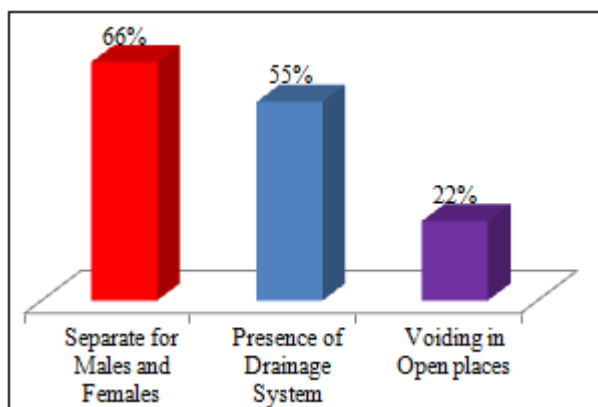


Figure 3: Dumping Used Water Pockets on the ground nearby Temple

Table 4: Observation of Sanitary Status at Kotappakonda on MahaShivaratri

S.No	Sanitary Status (187 Inspections)	Yes	Percentage
1	Bath rooms - Clean	128	68.4%
2	Bath rooms - Water Availability	143	76.4%
3	Bath rooms - Free	64	34.2%
4	Toilets - Clean	135	72.1%
5	Toilets - Water Availability	143	76.5%
6	Toilets - Free	62	33.1%
7	Whether people are using Bath rooms or Toilets	161	86.6%

Sensitization of public is very poor and there are no arrangements of temporary toilets for the crowd and Permanent toilets which are present were also not maintained properly. Lakhs of pilgrims are visiting and few toilets were available which clearly indicates in scarcity in number of toilets. All Medical students observed the sanitary conditions, status of toilets and bath rooms separately and their findings were written in 187 forms which indicates total of 187 inspections by all students. It was noticed that 68.4% of bath rooms were clean and 76.4% of them have proper water availability. Even though there was no fee for use bath rooms and toilets sometimes they are charging the money for using them. (Table-4)



Graph 3: Different Sanitary Measures

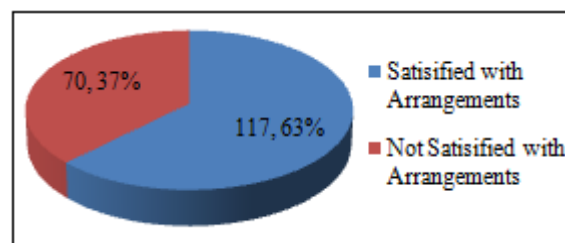
Out of total 187 inspections in 66% inspections separate toilets for Males and females were noticed by our Medical

students. In 55% inspections they found the presence of drainage system and 22% inspections noticed that public were avoiding in open places (Graph-3). During interview it was mentioned that 86.6% of study participants were used public bath rooms and toilets. More than 60 % told that they were clean and 77.5% told that water was available. Very few permanent toilets and bath rooms structures were available either on the hill or below the hills not a single makeshift toilet is available in any of the places in Kotappakonda Mahashivaratri festival. All were Indian toilets and few (11.2%) mainly old age people prefer western toilets (Table-5)

It was observed that 63% of pilgrims were satisfied with Sanitary measures and 37% were not satisfied with these arrangements of toilets and number of dustbins kept above and below the hilly areas and also temple premises (Graph-4)

Table 5: Sanitary Status- Interview at Kotappakonda on MahaShivaratri

S.No	Sanitary Status (N=187)	Yes	Percentage
1	Are you using public bath rooms and Toilets	162	86.6%
2	Are they Clean	114	60.9%
3	Water Availability	145	77.5%
4	Indian Toilets	187	100%
5	Preference for Indian Toilets	166	88.8%
6	Makeshift Toilets	0	0%



Graph 4: Satisfaction with Arrangements of sanitation and toilets

4. Discussion

The present study was conducted in the kotappakonda in Guntur District of Andhra Pradesh during February 2018. It was conducted with the support of Police Department, Government Andhra Pradesh and Director of Rajiv Gandhi Institute of Medical Sciences, Ongole., Prakasam District. Proper assessment is essential for availability good food and sanitary conditions for visiting pilgrims and also about presence of toilets and good hygienic practices in mass gatherings or Melas.

It was observed in our study that there were presence of small and large food stalls and shops without s numbering. Out of total 187 inspections in 18.7% places food was properly covered at the stalls. A study in Ghana country found that lack of training in food safety and good hygiene lead to risk of contamination and sometimes street foods are stored at improper temperatures.²⁰ only 28.8% of the pilgrims were used the dustbins for disposing the leftover food and the remaining 72.2% dumped the food on road side. Similar type of study from our Andhra Pradesh state noticed that that food and water facilities in people stuck in traffic jam were not planned or addressed.²¹

In developing countries, up to an estimated 70% of cases of diarrheal diseases are associated with the consumption of contaminated foods.²² we found in our study that foods and ingredients were subjected to contamination from unwashed hands and the materials used for wrapping, with old newspaper and the study conducted by K.R. Robert et al was also revealed similar findings.²³ Food demands of large number of inmates and devotees are higher, hence large volume of food was prepared on a daily basis which increases the need for maintenance of food hygiene.^{24, 25} In our study 54% study participants mentioned that hotel food was fresh, as per 48.1% public observation it was tasty. Only 36.9% pilgrims' expressed that this food was hygienic and more than 60.7% mentioned that food was served by plates.

Improvements in the capacity to process foods to safely preserve, store, and transport food are needed to reduce food wastage and to ensure sufficient food supply.²⁶ Purchasing ready-to-eat foods from street vendors poses a considerable risk to public health due to the poor hygienic practices.²⁷ Only 14.4% pilgrims were bringing the food from their homes and 64.7% of the public visiting the Kotappakonda are buying food from hotels. In Huparifair study by sandipetal revealed that food and water getting lowest rank because food is very costly and water is not pure.²⁸ KumbhMela in Allahabad with around 48 milk booths and over 40 food stalls which will be present in the food court. In our study more than 79% of inspections revealed that baby foods are not available in the premises of Kotappakonda hilly area. Milk is not available at 71.2% observed shops. No separate milk booths were established at kotappakonda.

We found 68.4% of bath rooms were clean and 76.4% of them have proper water availability. It was observed that 63% of pilgrims were satisfied with Sanitary measures and 37% were not satisfied with these arrangements of toilets. More than one lakh cleaning agents (Swachhagrahis) are

being deployed to maintain the hygiene and cleanliness at all times in the KumbhMela, whereas at kotappakonda, even though cleaning sanitary workers deployed in hundreds they were insufficient to cope the burden.²⁹ Health care services and water sanitation and hygiene conditions were found to be satisfactory.³⁰ Insufficient number of sanitary inspectors; the inability of sanitary inspectors to take penal actions against street food vendors; and absence of appropriate training and supervision of street food vendors³¹ and similar findings were noticed in our study

There are no arrangements of temporary toilets, few permanent toilets available to meet the demands of pilgrims and not a single makeshift toilet is available in any of the places in Kotappakonda. On observation toilets were clean (68.4%) and water facility is available (76.3%) It was observed that 37% were not satisfied with the sanitary arrangements of toilets. In Dhanuyatra mass gathering preparations, in Baragarh district of Orissa, The Municipality authority is introduced the portable toilet system to manage the human excreta and they are arranged 20 toilets with 4 square yards for waste disposal and they were also arranged permanent urinals on strategic locations. and 22% inspections noticed that public were in our avoiding in open places³²

Our findings are not consistent with the claims made by previous studies done on KumbhMela. The authorities arranged 40, 000 portable toilets.³³ Some shortfalls were that drainage was found to be a major problem. It was noticed in our study that 66% inspections had separate toilets for Males and females .Special facilities and separate toilets for men and women would improve their stay in the Mela, and will help to improve the public health conditions and increase the effective use of toilet facilities provided. Improvement in drainage facilities and reduction in fire incidents are basic but essential tasks to make Mela cleaner and safe and in 55% inspections we found the presence of drainage system. With the mission to provide safe and clean drinking water for the devotees, water quality was tested by Jal board, and it had constructed retention pools for sewage collection in the Mela area.^{24, 25}

Even though arrangements made for disposal of wastes at kotappakonda, still these were not as per standards and more use of plastic covers and packed waters which were main threat to environment. In contrary, a good practices initiated by the District administration Bargarh, Orissa a polythene free with the help of Merchant association and this programme may develop a new social behavior during Dhanuyatra and entire polymer based waste used to be collected and recycled in the local cement industry.³² Many research groups are working at grassroots level to find out the right mechanism to minimize the impact of food and water waste as a result of large gathering.³⁴

Many food stalls, fruits shops, small and large scale shops were placed haphazardly and not maintain quality. Very few sources of drinking water facilities were available on the hill near the Temple the same water is using for washing the hands and cleaning the legs and there is need more drinking water taps to clear the thirst of pilgrims.

5. Conclusions

Fresh, hygienic, tasty and properly covered food need to be available either at food stalls or Free Food Distribution places and Serial numbers can be given to all the shops and a food inspector from Narsaraopeta can be deployed at Kotappakonda area. Proper waste disposal system need to be established and sufficient number of dustbins can be placed in different areas. Good number of makeshift toilets need to be placed during Mahashivaratri above and below the hilly areas and there is need of construction of an extra permanent toilets especially near the foot path way.

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