A Comparative Analysis Of The Performance Of LPG Iron Box And Charcoal-Based Iron Box With Reference To Coimbatore District

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Abstract: Iron box is the common heat source used for pressing clothes. In earlier days, Iron boxes were operated using charcoal obtained from burning of forest wood and country wood. Later on Electric iron boxes came into use in households and laundry services. Nowadays, modern iron boxes like robot automatic iron machines and steam iron machines are available for pressing clothes. In India, there are several families involved in ironing services; they prefer coal-fired iron boxes because they are cheap. Iron pressing through coal has drawbacks like burning coal particles spilling on the clothes and air pollution. These drawbacks are overcome with the brand-new iron machine "LPG (Liquefied Petroleum Gas) Iron Box". LPG Iron is efficient, eco-friendly and economical.

Index Terms: LPG Iron Box, Charcoal, 5 Kg commercial cylinder, Environmental impact.

1. INTRODUCTION

LPG iron box operates through commercial LPG cylinder, combustion chamber, pressure regulator, a connection hose and designed with a metal base. The thermal conductivity is controlled through a control box. LPG is released from an LPG cylinder through the hose at the pressure which is regulated by a regulator. LPG iron box can be used in laundry services, pressing shops and even in households. LPG powered irons are safer and more economical when compared to charcoal iron and electric irons. In order to expand the reach of 5 Kg commercial cylinders to the new market segments, Indian Oil Corporation launched 5 kg commercial cylinders for operating LPG iron box at Laundry/ Ironing segment was explored and targeted for usage of LPG in Tamil Nadu after Maharashtra and Kerala. These LPG iron boxes are easy to handle by commercial launderers and cloth-pressers. In the conventional coal operated iron, laundrymen inhale the emissions of carbon dioxide, resulting in respiratory problems, whereas the LPG iron boxes are eco-friendly and cost effective compared to coal. LPG is a clean source of fuel where launderers can be saved from respiratory issues [1 – 5].

1.1 Commercial Application

An average launderer will iron 100 to 120 pieces of clothes per day which works out to 2500 clothes per month requiring three 5 Kg cylinders. This application has been found to have potential for providing environmental, health benefits to the cloth pressers. LPG run irons can be used in laundry services, hotel industries, garment shops, road side launderers etc. The User has to procure LPG iron box with commercial LPG cylinder for ironing purpose. LPG iron is environment friendly and cost effective. The launderers can easily afford the refill cost of LPG compared to charcoal.

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TABLE I

COMPARATIVE TABLE SHOWING THE BENEFITS OF LPG BASED IRON BOX OVER CHARCOAL IRON BOX IS GIVEN BELOW (Source: Indian Oil)

Attributes	LPG Iron	Charcoal Iron
Initial heating Time	2 Minutes	40 minutes
Weight of Iron Box	6.5 Kg	6 kg with coal
Hygiene	LPG fuel	Smoke emitting fuel
Ease of Use	Easy to operate within a minute	Pre-heating process takes half an hour
Eco-friendly	Pollution free	Causes air pollution
Quality of Ironing	Free from fire spark	High chances of fire Spark
Fuel and energy source	Works with LPG fuel	Works with Charcoal
Price of Iron Box	Rs.7000 - Rs.8000	Rs.6000

The advantages of LPG based Iron Box over the conventional Charcoal based Ironing

1) Preparatory time

In LPG ironing initial heating time required is only 2 minutes. In Charcoal based ironing, initial heating time takes minimum 45 minutes for burning the charcoal and it will be very difficult during rainy days to bring it to the required temperature. Charcoal ironing needs to be done twice a day and requires 1.5hrs of preparatory work.

2) Economy

In LPG ironing, a launderer can iron 900 pieces of clothes using one 5 Kg cylinder which works out to Rs 0.25p to 0.50p per cloth as against Rs.0.75p to Rs.1.00 per cloth while using charcoal iron.

3) Health benefits

Charcoal based ironing causes eye irritation whereas in LPG fueled ironing, heat radiation is minimum. Carbon Monoxide (CO) Emission in LPG ironing is almost nil (0.2 gram/Mega Joules), whereas in Charcoal, Carbon Monoxide (CO) emission ranges 2.6-2.9 gram/MegaJoules which causes dull headache, dizziness

and weakness.

4) Time saving
LPG based iron over Charcoal saves minimum 2 hrs due to lesser preparatory time and ash removal. Launderer need not wait for heating of the iron box, as LPG iron heats in a minute.

5) Environmental Impact
In LPG ironing, Carbondioxide (CO2) emission is in the range of 120-140 gram/MegaJoules, whereas in Charcoal burning, Carbon-di-oxide (CO2) is 240-260 gram/MegaJoules. In the production and usage of charcoal a large quantity of CO2 is emitted from burning of charcoal. LPG based ironing replaces conventional method and helps to sustain the environment.

2 STATEMENT OF THE PROBLEM

In today's world the use of iron box in the commercial sector has been modernized and LPG iron box is one such modern gadget. Use of LPG iron box in Coimbatore district is found to be gradually increasing. As the traditional way of charcoal ironing has its own disadvantages, LPG ironing solves various issues for the persons engaged in the trade. It is understood that Charcoal based iron workers face more health-related issues due to the smoke from coal. The Cloth pressers spend much of their time to get the charcoal into smolder mode to start their work, whereas LPG iron box overcomes all the disadvantages of charcoal-ironing. This study ascertains the performance comparison of LPG ironing and charcoal ironing in Coimbatore district.

3 OBJECTIVES OF THE STUDY

- To study the demographic and socio graphic profile of the respondents.
- To compare the performance of LPG iron box with charcoal iron box.
- To analyze the impact of working hours, clothes ironed per day and production cost towards LPG iron box.

4 SCOPE OF THE STUDY

The study is about comparison of attitude and perception of iron workers towards Charcoal based ironing and LPG ironing. The study will help the LPG iron box manufacturers to know about the performance of LPG iron boxes and identify improvements needed to make them better. LPG ironing can also be adopted in garment industries on a large scale.

5 RESEARCH METHODOLOGY

Type of research: Descriptive in nature
Type of data collected: Primary and secondary data were collected.
Primary data: Questionnaire
Secondary data: Articles, websites and magazines
Type of sampling used for data collection: As the population size is scattered widely simple random sampling is used for data collection.
Sample size: 82
Tools used for the study: Percentage analysis, Kruskal wails test and One-way Anova

6 LIMITATIONS OF THE STUDY

The sample size is limited to 82.
There may be a bias towards primary data collected from the respondents.

7 ANALYSIS AND INTERPRETATIONS

COMPARISON BETWEEN GENDER AND ACCEPTANCE TOWARDS USAGE OF CHARCOAL AND LPG IRONBOX
Ho1: There is no relationship between gender and factors related towards usage of Charcoal Iron box and LPG iron box.

Table 2
FREQUENCY ANALYSIS

		Gender	N	Mean Rank	F	Sig
Using Iron box for all season	Charcoal Iron box	Male	54	41.69	.907	.014
		Female	28	41.14		
		Total	82			
	LPG Iron box	Male	56	40.32	.107	.000
		Female	26	39.13		
		Total	82			
Radiation	Charcoal Iron box	Male	54	43.53	1.464	.226
		Female	28	37.59		
		Total	82			
	LPG Iron box	Male	56	39.13	1.326	.314
		Female	26	36.239		
		Total	82			
Working with iron box anywhere	Charcoal Iron box	Male	54	41.48	.991	.000
		Female	28	41.54		
		Total	82			
	LPG iron box	Male	56	36.56	1.125	0.003
		Female	26	34.53		
		Total	56			
Health problem	Charcoal Iron box	Male	54	40.50	.373	.542
		Female	28	43.43		
		Total	82			
	LPG iron box	Male	56	18.15	.243	.123
		Female	26	12.32		
		Total	56			

7.1 Interpretations

The above table shows that relationship does not exist between gender and radiation when using charcoal iron box (0.226) and health problem while using charcoal iron box (.542). Meanwhile there is a relationship between gender and using Iron box for all season (0.014) and working with iron box anywhere (0.000). The above table shows that there is no relationship between gender and radiation when using LPG iron box (0.314) and having health problem while using LPG iron box (.123). Meanwhile there is a relationship between gender and use of LPG Iron box for all season (0.000) and working with iron box anywhere (0.003). The results reveal that with the respondents using charcoal Iron box male respondents (41.69) have higher level of acceptance towards using Iron box for all season, whereas female respondents (41.54) have higher level of acceptance towards working with iron box anywhere. The results reveal that male respondents using LPG Iron box have higher level of acceptance towards using Iron box for all season (40.32) and working with iron box anywhere (36.56).

COMPARISON BETWEEN WORKING HOURS OF THE RESPONDENTS AND ACCEPTANCE TOWARDS USING LPG IRONBOX

Ho2: There is a significant difference between working hours

of the respondents and acceptance towards using Charcoal and LPG iron box.

TABLE 3
DESCRIPTION FOR USING CHARCOAL AND LPG IRON BOX

Using Iron box for all season	Charcoal Iron box	F	0.698
		Sig	0.674
	LPG Iron box	F	1.395
		Sig	0.000
Radiation	Charcoal Iron box	F	0.272
		Sig	0.936
	LPG Iron box	F	1.543
		Sig	0.002
Health problem	Charcoal Iron box	F	1.273
		Sig	0.275
	LPG Iron box	F	1.595
		Sig	0.030

It reveals that there is a significant difference between working hours of the respondents and acceptance of using iron box for all seasons (0.674), radiation with Charcoal iron box (0.936) and Health problems with iron box (0.275). There is no significant difference between working hours of the respondents and lunch time being affected due to Charcoal iron box (0.002) and Charcoal changing after lunch (0.034). The respondents who are working for 5 hours a day (4.33), 7 hours (4.50), 8 hours (4.27), 9 hours (4.38), 10 hours (4.80) and 12 hours (4.24) a day strongly disagree with lunch being affected while using Charcoal iron box. The respondents who are working for 8 hours a day (3.75) and 10 hours a day (3.5) agree about lunch time being affected while using Charcoal iron box. The respondents who are using Charcoal iron box for 11 hours a day are neutral (3.0) about lunch time being affected while using Charcoal iron box. All the respondents who are working with all-time group taken for the study strongly agree (1.0) on charcoal being changed after lunch. It reveals that there is a relationship between working hours of the respondents and the respondents who are using LPG. All the respondents who are using LPG iron box have higher level of acceptance towards usage of LPG iron box for all seasons, with no radiation or health problem while using it.

8 FINDINGS OF THE STUDY

The collected data reveal that cost towards LPG iron is lower on an average compared to charcoal ironing. The respondents feel that their health is getting affected due to usage of charcoal iron box. All the respondents who are working with all-time group taken for the study strongly agree on the need to change charcoal after lunch. Male respondents have higher level of acceptance towards using Iron box for all seasons. There is a moderate relationship between cost spent per cloth and acceptance towards using LPG iron box.

9 SUGGESTIONS

Charcoal-based iron workers can be advised to use LPG iron box. The awareness of LPG gas iron box can be made through various sources of advertisement to increase the number of users. LPG-based iron box can be used in commercial sector too. As LPG iron box is ideal for ironing compared to charcoal ironing, women cloth pressers can also do ironing in an eco-friendly environment.

10 CONCLUSIONS

LPG is the most efficient fuel which plays a vital role in sustaining environment by overcoming the limitations of conventional Charcoal based ironing. The study concludes that the respondents who are using LPG iron box are satisfied with the cost affordable for ironing when compared to the conventional method of charcoal ironing. Launderers prefer to use 6 -7 Kg iron boxes only for its optimum weight for easy operation and quality ironing. They prefer to use iron boxes with brass base because of better heat conduction and non-rusting quality. Hence LPG fueled iron boxes fulfill the above qualities for ironmen to operate instantly without fumes. Also, it overcomes various environmental issues related to conventional ironing. The cloth pressers can save their valuable time with the use of LPG iron box.

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