The main objective of review of past research work is to be familiar with the result of those researches in areas where similar concepts and methodologies had been used successfully. Further an extensive or even comprehensive process of such review may offer critical links with the various phases and developments in the research in one’s area of specialization and make acquainted with the various concepts, explanations and findings. A review of previous related research work helps the researcher to formulate satisfactory structure for his or her research plan.

The present study was designed to assess the impact of awareness programme for women on consumption of Functional Foods residing at Raipur city of Chhattisgarh state. Chhattisgarh state is a target group for the marketing of high cost nutraceuticals products of multinational food companies. Functional Foods are better option and substitute for nutraceuticals and synthetic dietary supplements. Success requires comprehensive knowledge on dimensions behind in acceptance of Functional Foods by consumers. Awareness creation among the population especially women on nutrition is the key for success of all government and non-government programmes on health and nutrition. Several studies in field of nutrition support the concepts which are expanding, from emphasis on the use of food for survival and hunger satisfaction to encourage the use of foods to promote a state of wellbeing, better health and to reduce the risk of disease. Therefore the related information from worldwide including from India was documented for detail analysis. The literature during the research work had been discussed and keeping in view its significance a paraphrased version under suitable caption has been arranged. The literature under review focuses on the following heads:

- Functional Foods: health claims studies-worldwide
- Nutritional awareness studies-worldwide
- Functional Foods: awareness studies-countrywide

2.1 Functional Foods: Health claims studies-worldwide

All foods are functional as they provide taste, aroma and nutrients. Within the last decades, the term “functional” applied to food has adopted a different connotation—that of providing an additional physiological benefit beyond that of meeting basic nutritional needs. The concept of Functional Foods containing specific physiologically active components originated in Japan as a means of improving the health of the nation
and thus, reducing the drain on the economy caused by escalating health costs. There is a growing interest in this area from food manufacturers both in Europe and the USA, and a few functional food products are appearing on the Indian market.

There are wide varieties of foods like citrus fruits, vegetables, tomatoes, garlic, soy products, dairy products, oat meals, tea, chocolate and cocoa etc. which are consumed for enjoyment and to add varieties in diet, but there is lack of information regarding their specific functions. This is fact that intake of these foods is occasional and maximum benefits are not availed due to lack of information. Different researchers indicated that these foods can reduce the risk of different diseases. Insufficient knowledge about Functional Foods and their importance for goodness of health and wellbeing has been observed not only in common population as well as also in highly qualified adults. Food consumption plays an important role in health and understanding the process of food choice is central to health promotion. Concepts in nutrition are expanding from emphasis on the use of food for survival, hunger satisfaction and preventing adverse effects, to encourage the use of foods to promote a state of wellbeing, better health and to reduce the risk of disease.

The term Functional Foods was first introduced in Japan in the mid 1980s and denotes to foods which are processed and containing ingredients that support specific bodily functions along with nutrition. Japan is the only country that has formulated a specific regulatory approval process for Functional Foods, known as “Foods for Specified Health Use (FOSHU)”. Currently 100 products are licensed as FOSHU foods in Japan. Thomas & Earl, (1994), defined Functional Foods “as any food or food ingredients that may provide a health benefit beyond the traditional nutrients it contains”

This term seems meaningless to some people because every food is functional in the sense that it provides protein, energy, fibre, or micronutrients. However the concept of Functional Foods emphasizes that for a food to be regarded as functional, when it provides benefits more than the nutrients necessary for normal health. Thus, Goldberg, (1994) defined Functional Foods “as any food or food ingredients that have a positive impact on an individual’s health, physical performance or state of mind”.

Drozen et al., (1998) defined Functional Foods as “food products that provide specific health benefits beyond the traditional nutrients they contain” or foods containing significant levels of biologically active components that impart health benefits beyond the basic nutrition.” Most of the people want to eat a healthier diet
without fundamentally changing their eating patterns or dietary habits. The Functional Foods are supposed to be eaten as component of the regular diet. In some cases, one or more additional ingredient are added that provide health benefits above and beyond those of regular food.

The dietary fibre was the first functional ingredient which got commercial success as well as rapid increase in demand for drinks containing high levels of fibres in 1980’s. This was the start of the Functional Foods market in Japan and rest of the world.

The term ‘Functional Foods’ comprises some bacterial strains and products of plants and animal origin containing physiologically active compounds beneficial for human health and reducing the risk of chronic disease. According to definition functional food is a part of an everyday diet and is demonstrated to offer health benefits and to lessen the risk of chronic disease beyond the widely accepted nutritional effects (Hasler, 1998).

The term “Functional Foods” arose as nutritional science evolved from identifying and correcting nutritional deficiencies to designing foods that promote optimal health and reduce the risk of chronic disease. Focus group research showed that “Functional Foods” was recognized readily and was preferred by consumers over other terms such as “nutraceuticals” or “designer foods” (International Food Information Council, 2002).

In 2009, the American Dietetic Association (ADA) released a position paper where Functional Foods were similarly defined as foods that “provide additional health benefits that may reduce disease risk and/or promote optimal health” (Hasler and Brown, 2009).

The European Commission Concerted on Functional Food science. In Europe foods regarded as functional foods when they contain a beneficial effect on some functions of the body in the natural form of food, not as dietary supplement.

American Dietetic Association (ADA 2004, 2009) defines Functional Foods "That include whole foods and fortified, enriched or enhanced foods have a potentially beneficial effect on health when consumed as part of a varied diet on a regular basis, at effective levels". The ADA classify Functional Foods into four categories: conventional foods, modified foods, medical foods, and foods for special dietary use.

Functional Foods, as defined by the Institute of Medicine in Washington, are "those foods that encompass potentially healthful products including any modified
food or ingredient that may provide a health benefit beyond the traditional nutrients it contains". Foods like, breads beverages and cereals which are fortified with herbs, vitamins, or nutraceuticals can be considered as Functional Foods.

The position paper of ADA supports Food and Drug administration approved health claims on food labels when based on rigorous scientific substantiation. All food is essentially functional at some level as it provides energy and nutrients needed to sustain life. However, there is growing evidence that some food components, not considered nutrients in the traditional sense, may provide positive health benefits. Foods containing these food components are called Functional Foods. Functional food research holds many promises for improving the quality of life for consumers; however, to achieve such outcomes, scientific research must effectively establish the bioavailability and efficacy of these compounds at levels that are physiologically achievable under typical dietary patterns. This Position Paper reviews the complexities of defining Functional Foods; categories of foods marketed as functional; regulation of Functional Foods; the scientific substantiation of and advancement of functional food research; as well as a message to registered dietitians and dietetic technicians, registered, on how to remain current in their knowledge of functional food research and the translation of this information to consumers (ADA Reports 2004).

Conventional Foods are the largely basic of the Functional Foods because they are crude not modified or enriched or fortified. These foods are in their natural state. Natural fruits and vegetables fall into this class as they are rich in phytochemicals as lycopene and lutein, as well as other beneficial compounds.

Several factors indicate the fact that Functional Foods are one of the most promising areas of research in the fields of nutrition sciences. An emphasis in research on links between diet and dietary constituents and health benefits, a positive regulatory environment, the user’s self-care phenomenon, and fast growth in the market for health and wellness products are some considerable factors.

Functional Foods can be accepted to be whole, fortified, enriched or enhanced foods that provide health benefits beyond the provision of vital nutrients vitamins and minerals if they are consumed at effective levels as part of a mixed diet on a regular basis. Hasler, (2005) categorized a variety of Functional Foods on the basis of evidence supporting their functionality, the extent of that evidence and the recommended intakes. Functional Foods represent one of the most intensively investigated and widely promoted areas in the food and nutrition sciences.
today. The remedial power of foods is a accepted concept that focuses on how "super foods" can have health-protecting quality. In natural products industry "nutritionally high powered foods" or Medicinal foods were included since a long time but emerging scientific research and, mainly, public interest has joined them in the mainstream.

It has been well accepted for years that diet manipulates many health conditions and diseases. It is evident that dietary factors affect maintenance of optimal health. Functional Foods can improve performance and bring benefits for conditions like cardiovascular diseases, neural tube defects and osteoporosis. Many food components were recognized by researchers. They may improve memory, reduce arthritis, and provide other benefits which are at present limited to drugs. In future foods having benefits for better energy, better sleep and mental alertness can be included.

According to Farr, (1997) Functional Foods have become the corner stone of food innovation in the past few years. All big food companies are investing in Functional Foods because the mega trends in society seem to require healthy food with added benefits to improve the health, wellness and quality of life of people. There are more failures of functional food products out in the markets than there are global successes. The analysis of this phenomenon shows that the invention of new food products has to start in the mind of the consumers. A consequent orientation at consumer insights, translated into relevant, noticeable benefits, added to trustworthy and adequate brands, may be one potential route to market success.

Functional Foods are at the threshold of extraordinary influence on public health and disease prevention. Overwhelming evidence from epidemiological and clinical trial data indicates that plant based diet (high in fruits and vegetables) can reduce the risk of chronic diseases, particularly cancer. It is now clear that there are elements in a plant based diet other than conventional nutrients that can reduce cancer risk. There is a long list of Functional Foods, beneficial for health.

Oat products are widely studied as dietary source of the cholesterol lowering soluble fibre b-glucan, thereby reducing the risk of coronary heart disease. Soy is a high quality protein as assessed by the FDA’s “Protein Digestibility Corrected Amino Acids Score” method it is now thought to play preventive and therapeutic roles in cardiovascular disease, cancer, and osteoporosis and in the alleviation of menopausal symptom. Tomatoes have received significant attention because of lycopene present in
this fruit. Lycopene acts as anti-oxidant and reduces the risk of cancer of prostrate, breast, digestive tract, cervix, bladder and skin.

Study led by Yang, (2010) had correlated frequent intake of capsaicin to a reduction in blood pressure, after long-term intake. The study provided new evidence to support the theory that capsaicin can improve blood vessel function and lower blood pressure, which provided support to use capsaicin as a dietary supplement or functional component in foods, mediate a positive effect in the cardiovascular system by promoting nitric oxide release and reducing blood pressure.

Research led by Jeong et al., (2011) recommended that capsaicin can reduce weight by stimulating the expression of certain fat degrading proteins, prevent fat synthesis. The study involved high fat diet to rats and other group with treatment of capsaicin. The capsaicin-stimulated rats lost 8 percent body weight compared to the no capsaicin fed rats fed on the same diet. Importantly the new research also illustrated that capsaicin fed rats showed changes in expression of over 20 key lipid processing proteins.

Garlic commonly used in Indian cuisine is widely quoted in literature for its medicinal properties. Health benefits of garlic are many including antihypertensive, cancer chemo preventive, antibiotic, and cholesterol-reducing properties.

Several epidemiological studies have shown the citrus fruits like oranges, lemons, limes are principal source of vitamin C, folate, fibres and limonoid, are protective against variety of human cancer. Orange juice flavanone may benefit heart health.

The research, published in the American Journal of Clinical Nutrition, recommended that daily consumption of orange juice may lower diastolic blood pressure significantly among men who are healthy but slightly overweight. The researchers Morand, et al., (2010). found that blood pressure was considerably lowered after 4 weeks consumption of orange juice.

Black seedless grapes and red wine contain high concentration of phenolics, which prevent the oxidation of LDL, a critical event in the process of athero-genesis. Many researches indicated that cocoa used in chocolate contains chemical component which act as antioxidants. Italian research report studied that consumption of dark chocolate containing 860 mg of poly phenols and 58 mg of epicatechins, led to a 20 percent of reduction in DNA change, two hours after consumption. Consumption of foods rich in cocoa may reduce blood pressure.
Although the enormous number of naturally occurring health promoting substances are of plant origin. There are varieties of physiologically active component in animal products that deserve attention in their potential role in optimal health. Omeg-3 (n-3) fatty acids are an essential class of poly unsaturated fatty acids drained primarily from fish oil. Researchers have been suggested that n-3 fatty acid play an important role in cardiovascular diseases and cancer.

Scientists from the University of Western Australia and the University of Montpellier (France) report that daily supplements of four grams or either EPA or DHA for six weeks were linked with decrease of about 20 per cent weight. Mas et al., (2010) recruited two sets of people to take part in their study. One group included 59 overweight men with abnormal blood lipid levels, and the other group was of type-2 diabetics receiving treatment for high blood pressure. The subjects were randomly assigned to receive daily doses of 4 grams of EPA, DHA or olive oil for six weeks. Researchers noted that EPA reduce urine levels of F2-isoprostanes by 24 per cent in the overweight men and by 19 per cent in the diabetics at the end of the study, while DHA was related with a 14 and 23 per cent decrease in these groups, respectively, compared with the olive oil groups. Authors noted that a previous study in healthy subjects also reported benefits, which, matched with their findings, illustrated that omega-3 supplementation might reduce F2- isoprostanes in both healthy and ill populations.

There is no doubt that dairy products are Functional Foods. They are one of the best sources of calcium, an essential nutrient which can prevent osteoporosis and possibly colon cancer. In addition to calcium recent research has focused especially on fermented dairy products known as probiotics (live microbial feed supplements). Probiotics have been shown to have various health benefits enteric pathogens.

Farvin et al., (2010) studied the antioxidant properties of protein fragments produced when milk is fermented into yogurt. Yogurt proteins sample of different sizes (3kDa, 10kDa, and 30 kDa) were tested for antioxidant activity. The proteins with smaller size in omega-3 enriched milk with high antioxidant properties were then examined. They have a little oxidative stability, and were found to offer protection against oxidation of fish-oil enrichments. Naturally occurring antioxidant peptides could be used for prevention of oxidation of omega-3 in functional foods.

Along with probiotic, there is growing interest in prebiotic which are fermentable carbohydrates like starches, dietary fibres, and oligosaccharides (banana,
garlic, onion, milk, honey). A possible relation between green tea consumption and low diabetes risk was already explored. Tea-drinking possibly will bring modest benefits for glucose homeostasis and support the cardiovascular system remaining healthy.

According to Ehab et al. (2010) high intake of both soluble and insoluble dietary fibres may lessen the risk of death from cardiovascular diseases amongst Japanese men and women. They pointed out epidemiological studies in the west recommended that dietary fibre intake offered protection against cardiovascular disease. Mean dietary fibre intake among Japanese (around 14 g/d) was similar to that of some western countries, but until now similar studies have been rare in Asia. Results represented supporting evidence that greater intake of both insoluble and soluble fibre, especially fruit and cereal fibres, may favour in the prevention of coronary heart disease in Japanese men and women subjects.

Green tea polyphenols appear to have anti-tumorigenic properties, and form 30-40% of the dry weight of green tea compared with only 3-10% of black tea. Numerous studies in multiple animal models and different cancer cell lines have demonstrated the anti-tumorigenesis by green tea polyphenols. Zhang et al., (2012) have conducted one prospective cohort study in ovarian cancer patients and five case-control studies in ovarian, breast, and colorectal cancers, and leukemia over the past decade. This study suggested that higher consumption of green tea enhances survival of ovarian cancer, and decreases the risks of ovarian, breast, and colorectal cancers, and adult leukemia. It follows that increased consumption of green tea in those having little or no consumption could protect against cancer development and progression.

2.2 Nutritional awareness studies-worldwide

Food consumption plays an important role in health, and understanding the process of food choice is central to health promotion. A person’s life-course transitions and trajectories (persistent thoughts, feelings, strategies, and actions over the lifespan) are fundamental influences on the development of his or her personal system for making food choices. Devines et al., (1998) conducted analysis to examine influences on the fruit and vegetable choices of adults. A purposive, multi-ethnic sample of 86 adults in one U.S. city participated in semi-structured in-depth interviews about their life course, food choices, and influences on fruit and vegetable consumption. Qualitative analysis of interview transcripts, using a grounded theory approach based
on the constant comparative method, revealed that past life-course events and experiences were strong influences on present systems for fruit and vegetable choices. Life-course transitions, especially role changes and health events, placed people on relatively stable dietary trajectories that shaped current food choices. Most people experienced a few major transitions that influenced their fruit and vegetable choices, some being abrupt and some more gradual changes in their trajectories. Key influences on the trajectory included food upbringing, roles, health, ethnic traditions, resources, location, and the food system.

Awareness is the status or aptitude to perceive, to sense, or to be conscious of objects, events or subjects. In this level of realization, rational data can be confirmed by an observer automatically implying understanding. Mostly it is the condition or quality of being aware of something.

In psychology, awareness is described as a perception and sensitive reaction to a state or event. Awareness creation aims at promoting understanding and acceptance of the significance of various population problems. It brings facts and issues to the attention of large audiences or specific groups, such as decision-makers and opinion leaders. A Pan-European survey was carried out by Holgado et al., (2000) to assess the main sources of information about healthy diet in the European population and to assess whether these sources differ between a Mediterranean country and other European populations. This study belongs to a Pan-European survey on Attitudes to Food, Nutrition and Health. Results indicated that the source of information ‘television programmes or radio’ was more prevalent in the rest of the member states of the European Union (30.9%) than in Spain (25.7%). ‘Health professionals’ were mentioned with similar frequency as a source of information in Spain and in the rest of the European Union. Results confirmed that mass media play an important role in transferring messages about healthy eating to the general public.

Falk, (2001) carried out a study to improve understanding of concept and management of healthy eating among people. They conducted 79 open-ended interviews with interpretive approach and comparatively analyzed about food choices and eating behaviours of individuals for health-related topics. Participant reports illustrated cognitive systems for defining healthy eating, while continuous exposure to a multiple experimental and informational sources made participants to evolve individual meanings of health and diet. They focused seven themes for relating food and its consumption to their individual health. Defining healthy eating expressed how
participants classified food and eating situation as healthy and unhealthy. Participants explained different healthy eating strategies that were related with various healthy eating themes. These findings provide perception of how a varied sample of adults conceptualize and deal with healthy eating. Revealing the inherent and discrete nature of healthy eating conceptions offered information useful to health instructor promoting behaviour changes.

Bisogni et al., (2002) conducted a qualitative Study of identities in Food Choice. Open-ended detail interviews were used to study identity and eating from the standpoint of adult. Identities involved in Participants' food options related to common or preferred eating behaviours, individual behaviour, reference groups, and social classes. Results revealed different type, number and complexity of identities concerned eating. Identities reported by participants were stable and dynamic and were formed by participants' life course experiences. Participants showed variations in the attention paid by them to the process of evaluation and monitoring of eating related identities, the extent to which they acted out identities in eating, and how identity conflicts were managed by them.

In the earlier period, it had been supposed that consumers would accept novel foods on the basis of tangible and concrete benefit for consumer thus it was assumed that Functional Foods would rapidly be accepted. Frewer et al., (2003) had reviewed literature of different cross-cultural and demographic differences in acceptance and barriers to dietary change under the heading of “Consumer acceptance of Functional Foods: issues for the future.” It was concluded that for the development of information strategies, perceptive consumers’ risk and concerns related with emerging scientific innovations, processing technologies, and their personal health status might be helpful. This would be relevant to larger groups of individuals in the population, and convey real health benefits to high risk individuals or to people suffering from, major degenerative sickness.

A number of studies were conducted to review effective nutrition communication; Dillen, (2004) had examined the need of informations concerning food topics and chosen information sources by means of quantitative consumer research among Dutch adults of age group 18–80 years. A stratified sample of 923 adults was taken. He concluded that interested groups should receive tailored information, for other group and food issues, a population-wide strategy should be adequate, make use of the preferred information source. People who were not yet
interested become interested through life event, demanded information can be placed into action.

Roy et al., (2005) had conducted a probable randomized trial to test the effectiveness of a particular intervention for decreasing the extent of malnutrition of infants and to modify behavior of mothers concerning to child-feeding practices, care-providing, and health-seeking practices under the Bangladesh Integrated Nutrition Project (BINP). The study was carried out in rural Bangladesh among 282 children who were moderately-malnourished of age group of 6 to 24 months. First intervention group of mothers received intensive nutrition education twice a week for three months. The same nutrition education was given to second intervention group and children received additional supplementary feeding. The comparison group was given nutrition education from the community nutrition promoter two times in a month according to the standard routine service of project. For next six months the children were observed. After three months of period of intervention significant improvement was seen. Due to the intensive nutrition education and effective supplementation, maximum children improved from moderate malnutrition to mild or normal nutritional status. The Three months of interventions and six months of observation improved frequency of child feeding and home-made complementary feeding appreciably in both the intervention groups.

Lin et al., (2007) conducted the study to identify nutrition knowledge, attitude, and behavior in Taiwanese elementary school children, and the relationship of these components. The results indicated that children’s knowledge was poor in the physiological function of nutrients, relationships between diet and nutrients and disease and the daily serving requirement for different food groups but fair in basic nutrition. Children gave the importance of nutrition, but in food selections they did not show concern about the health benefit of foods. Their dietary quality was not adequate, and the diet of most children was inadequate in terms of recommended serving requirements for fruits, vegetable, cereals and grains groups and milk. Positive associations were found among, attitude, nutrition knowledge, dietary quality score and caring- about-nutrition behavior. The results showed that lack of knowledge may be the obstacle for implementing a balanced diet even if they had the desire to consume a balanced diet, but there is a gap between, attitude eating behavior and nutrition knowledge especially for fruits and vegetables. It may due to the attitude toward eating for health is not strong in this age group. Nutrition education should not
only include instrumental knowledge, like food serving requirements of food groups, but also apply suitable presumption to improve the motivation of eating foods which were thought to be good for health but may not be children’s preferences and to assess the socio demographic and psychosocial correlates of nutrition awareness.

A cross-sectional study was conducted by Dillen (2008), to reveal the concept of nutrition awareness and to assess the socio demographic and psychosocial correlates of nutrition awareness. For collection of data personal interview and questionnaire methods were used. Study was based on the Precaution Adoption Process Model and Stages of Change Model. The purpose of study was examination of possible correlates of nutrition awareness and the relationship with nutrition-related behaviors. This study unraveled the concept of nutrition awareness, understanding the correlates of nutrition awareness can contribute to a more effective application of behavioral change models. Results favored the increasing involvement with nutrition through personalizing and tailoring to the motivational stage.

Ha, et al., (2009) had assessed the effectiveness of implementing nutrition intervention by a general nutrition class to encourage consumption of fruits and vegetables in college students. Data of 3-day food records were collected, and analyzed before and after the intervention. Intervention emphasized on nutritional knowledge regarding prevention of chronic diseases, healthy dietary choices, fruit and vegetable consumption, dietary feedback, and interactive hands-on activities. Participants significantly improved consumption of not only total fruits and vegetables, but also fresh fruits and vegetables. Females gave better response to the intervention than males in increasing vegetable consumption. Authors had concluded that class-based nutrition intervention focusing on prevention of chronic diseases is a gainful approach to increasing fruit and vegetable consumption among college students.

Nutritional counseling is an important measure to combat dietary deficiencies. Montazerifar et al (2012) had recommended the need of nutrition education programs in schools for the prevention of diet related diseases in adulthood. In their study they evaluated the intake and food patterns of adolescent girls and found that girls had an improper dietary intake and food habits. The analysis of dietary intakes showed that energy, calcium, zinc, vitamin C and folate intake, compared to the Dietary Reference Intake (DRI), were found to be lower due to the infrequent intake of milk and dairy products, fruits and vegetables. Thus,
recommended the implementation of nutrition education programs in schools and the
designing of proper patterns towards healthier food choices could help improve eating
behaviours, the health maintenance of adolescents, and also prevent diet- related
diseases in adulthood.

Fallah et al., (2013) had conducted study to determine the effects of nutrition
education on levels of nutritional awareness of a representative group of pregnant
women in Western Iran. A quasi-experimental intervention was undertaken on a
random sample of pregnant women (n =100) attending urban health centers during the
year 2011 for prenatal care. A nutritional education program containing two to four
lessons was undertaken for small groups of between six to ten women. Nutritional
knowledge was assessed before intervention (pretest) and followed by two posttests
within three weeks interval. They concluded that nutritional education intervention
had a positive effect on nutritional awareness of pregnant women.

The knowledge and skills required to change poor nutrition and health
behaviour choices are often unavailable to those living with financial limitations.
Competing demands on time and resources may pose obstacles to their achieving
better diets. Rustad & Smith, (2013) researchers at the University of Minnesota had
conducted a study to observe the effects of three educational sessions on knowledge
and behaviours of 118 low-income women of ethnically diverse backgrounds. Results
showed that vegetable intake had increased, fast food intake was decreased. Food
behaviour of women improved after the sessions, as well as measures of knowledge.

Annunziata et al., (2011) gathered data on consumer behaviour toward
Functional Foods (FFs) through a quantitative survey conducted on 400 Italian food
shoppers. Principal components’ analysis highlighted the key role played by the
perception of healthiness in determining shoppers’ attitudes toward FFs. Findings of
this study may be useful for government bodies interested in designing public health
programs. In terms of marketing strategies, FFs need to be promoted with the aim of
making them much more visible and recognizable to final consumers in order to avoid
confusion with other generic health foods (such as light or diet products). Since the
present analysis highlighted that the perception of healthiness is the main factor
affecting consumer attitudes toward FFs. In terms of public interventions, the results
of this analysis suggest the need to focus mainly on education campaigns and
communication since consumers have a high degree of confidence in the information
conveyed by public authorities. However, such information is still scarce on a nationwide basis.

Functional Foods are foods that provide health benefits beyond basic nutrition. As consumers seek alternative ways to enhance health and prevent disease, incorporating Functional Foods into nutrition counselling plans and educational programs will become increasingly important. A study was established on Functional Foods to provide RDs with information on Functional Foods to educate consumers, assess consumer dietary intakes of nine Functional Foods (tea, broccoli, fatty fish, garlic, purple grapes/grape juice, oats, soy, tomatoes/tomato products, and yogurt) based on participation in a targeted nutrition education program and to evaluate the program content. (ADA, 2013)

One hundred forty-two educational kits were distributed to Illinois RDs. to present the kits to consumer groups within three months and distribute post-program questionnaires. Some of the information in the educational kit included an introductory video, overheads outlining specific food-health links, functional food guide pyramid and the ADA position paper on Functional Foods. In the questionnaire that was distributed, subjects indicated how often they ate each functional food. Consumption frequency was compared to existing recommended intake levels of these Functional Foods. (Pelletier 2002 et al.)

The results demonstrate that age, gender, and awareness of health benefits dramatically influence intent to change dietary habits. A positive indication was that the high percentage of subjects in study showed intent to consume more Functional Foods and they interested in proactive dietary measures to ensure good health.

Consumer Sciences Department, (2011) Institute of Food Research, and Department of Human Nutrition, University of Glasgow, Glasgow had conducted study on “a nutrition education intervention to increase fruit and vegetable intakes: impact on consumer choice and nutrient intake”. Intervention recommendation included the specific relationship of high fruit and vegetable intake with reduced risk of disease, practicalities, and portion definition with a target intake of greater than five 80 g fruit and vegetable portions per day for 8 weeks. There were statistically significant effects on weighed intakes of fruit and vegetables in the intervention group, increasing from 324 to 557 g/d and reflected by validate portion measures at 8 weeks intervention. In was concluded that the intervention considerably improved fruits and vegetable intakes chiefly via customary eating habits, with some desirable effects on
macro- and micronutrient intakes. Consumers were becoming more health conscious and were concerned in what they eat and its association to health. People are now looking for to optimize their performance, wellness and health along with reducing risk of most of modern diseases. Hence the demand and market value for promoting foods and food components is expected to grow.

Heim, et al., (2012) planned to explain pharmacologic activity of two novel preparations of berry and spinach extracts in vitro. Blueberry and cranberry showed the greatest antioxidant activity. Mixture of cranberry and blueberry extracts inhibited inhibitor of β kinase, a central node in inflammatory signal transduction. Mixture of blueberry, strawberry, and spinach extracts inhibited prolylendopeptidase, a regulator of central neuropeptide stability and an emerging therapeutic target in neurology and psychiatry. These results indicated specific molecular targets of blended dietary plants with potential relevance to inflammation and neurological health.

Xin et al (2013) planned randomized controlled trials to study the influence of fish oil on heart rate variability. It was concluded from the results that short-term fish-oil supplementation might be positively influence the frequency of heart rate variability, as showed by an enhanced vagal tone, which might be an important mechanism underlying the antarrhythmic and other clinical effects of fish oil.

Kawashima et al., (2013) had used a class of essential fatty acids, omega-3 polyunsaturated and omega-6 PUFAs, as an example of nutritional proteomics study. All vertebrate animals need to take polyunsaturated fatty acids represented by two major classes, omega-3 and omega-6, from diets. Fish is a good source of omega-3, whereas meats contain high omega-6. Fish, meat, and poultry are the two major groups of protein sources that many people consume every day unless one is a vegetarian; other sources of PUFAs are some nuts and plant seeds. It is well established that omega-3 acts as anti-inflammatory agent, whereas omega-6 as pro-inflammatory one. It is anticipated, however, that there could be unknown functions of PUFAs other than the regulation of inflammatory state. They had developed nutritional proteomics to promote a new area in functional food studies for a better understanding of the role of Functional Foods in health and disease.

Functional Foods are an effectual way to express beneficial agents. Functional Foods should become an essential part of public health programs meant to reduce disease risk. The major requirements are prevention of disease, support of health and well being, decrease of risk or delaying the onset of major diseases and consequently
reduction in the health care costs. Foods like fruits and vegetables and wholegrain cereals and their important role in disease prevention and the latest studies on dietary antioxidants and combinations of protective components in plants has helped to provide the momentum for further developments in the functional food market. Recent trends in population demographics and socio-economic changes also point to the need for foods with added health benefits. Functional Foods can make a positive contribution to health and well being when combined with a healthy lifestyle.

2.3 Functional Foods: awareness studies-countrywide

In India the popular forms of Functional Foods and nutraceuticals are available as traditional Indian Ayurvedic Medicines (IAM). In rural, inaccessible and remote areas of China and India are mainly dependent upon herbal medicines and naturally available resources which they use to treat general ailments, and as common protective and preventive remedy. Nowadays nutraceuticals and Functional Foods industry have become a multi-billion dollar industry in the world market products.

In the review article titled "Nutraceuticals and Functional Food as Future Food: A Review" Keservani (2010) wrote “In recent years there is a growing interest in nutraceuticals which provide health benefits and are alternative to modern medicine. Nutrients, herals and dietary supplements are major constituents of nutraceuticals which make them instrumental in maintaining health, act against various disease conditions and thus promote the quality of life. The explosive growth, research developments, lack of standards, marketing zeal, quality assurance and regulation will play a vital role in its success or failure.”

Dark Chocolates (DC) in recent years have gained greater significance & are recommended in the list of Functional Foods due to the polyphenols (Catechin, Epicatechin and Procyanidins) present in them. Nambiar et al., (2010) studied the effects of polyphenols from dark chocolate on the nutritional status of the middle aged gujarati jains. This study was aimed at investigating the polyphenol profile, fat as well as fatty acid profile of dark chocolate available in India and the impact of 50 g DC consumption for a period of 1 month on the nutritional as well as lipid profile of Gujarati Jain subjects. Forty [20 Exp. (M=10, F=10) & 20 Controls (M=10, F=10)] free living healthy Gujarati Jains (30-55yrs of age) were selected for the present study. Pre and post data were elicited on the socio-economic status, anthropometry, dietary pattern, FBS and lipid profile. The results of the present study supported the concept
of favorable effects of lipid health of the subjects and indicated that strong antioxidant polyphenols in dark chocolates had a positive impact on the lipid parameters. Findings indicated that dark chocolate should be consumed only as substitutes in a delightful way and not as an addition to the sweets in the daily diets. Author recommended a need of modifying the Nutritional Components of the supplemented dark chocolate in terms of decreasing the fat & CHO content, increasing the calcium content which may drive down the stearic acid content of these chocolates in vivo, increasing the cocoa content and make it more concentrated as it contains essential trace elements and nutrients such as iron, calcium, potassium and excellent source of magnesium and vitamins which are beneficial for the cardiovascular system and hypertension.

Patel et al., (2011) reviewed the chronic diseases and injuries in India. The principal causes of fatality and disability in India are chronic diseases like diabetes, cardiovascular diseases cancer mental health disorders. Most chronic diseases are similarly prevailing in poor and rural populations and often occur simultaneously. The coverage of cost effective primary and secondary prevention strategies is generally low, especially in deprived and rural populations. Chronic diseases including cardiovascular and respiratory diseases, mental disorders, diabetes, and cancers are the leading causes of death and disability in India and their burden will continue to increase during the next 25 years as a consequence of the rapidly ageing population in India Strong public policy commitments to control chronic diseases and injuries need to be implemented more robustly .

Choudhary & Grover, (2012) had studied that natural product interventions are currently being investigated on a large-scale basis as potential treatments for obesity and weight management. With advancing nutritional sciences, several nutrients such as; carbohydrates low-glycemic index with, 5-hydroxytryptophan, green tea extract, and chromium have been shown to support weight loss. The earliest two nutrients decrease appetite, green tea boosts the 24 hour energy expenditure, and chromium encourages the composition of the weight lost preferably fat than lean tissue. Each element has previously been revealed to promote weight loss independently in clinical trials.

Women have a special role in healthy nutrition of the population. The woman breastfeeds the newborn baby and prepares meals for members of her family. Women employees in food manufacturing, trade, public catering, health care and education account for the majority. In addition, public health depends upon women’s
understanding of healthy nutrition issues. According to Ghassemi (1990) focus should be on young women, simply because when women become healthier, would be better nourished and when their status in society improved, the world would be a better place, children would have a better future and development and progress would have a better chance. The role of the woman in implementing a healthy nutrition policy in the family is important as, being aware of the basic principles of healthy eating and implementing them, the woman can ensure the implementation of a healthy nutrition policy in her family. (WHO 2000) Women, therefore, play a key role in implementing a healthy nutrition policy, both in the family and in society.

The potential of women have to implement a healthy nutrition programme remains virtually unused. This is due mainly to lack of knowledge, availability of and access to healthy foods and economic difficulties faced by families.

In view of the important role of women, strategies required to achieve this multi-faceted role. If they are given the correct information, women can educate their children, husbands and relatives. The following channels could be used to implement this strategy, the mass media especially women’s’ magazines and TV programmes on cooking, dietary guidelines and recommendations by doctors and teachers, the retail trade, public catering NGOs.

Garg (2006) carried out a study to determine the nutritional status and dietary practices among deprived pregnant women, to measure the effect of nutritional counselling on their food intake, anthropometric measurements and status of anaemia. Interview of Hundred pregnant women from low socio-economic status was organised. Nutrition education was delivered in the form of simple messages to Nutrition education-group of 50 subjects for 10-16 weeks period. The remaining 50 subjects were considered as the Non-nutrition education group for comparison. Individual counselling, home visits (weekly) and group gathering were used as tools for data collection. Anthropometric measurements taken were height and weight. 24-hour recall method and food frequency questionnaire were used for collection of dietary data. Haemoglobin evaluation was done. Effect of intervention was measured by monitoring changes in dietary practices, gain in weight, and nutritional status of the women subjects.

Devi et al., (2006) had carried out a study to explore the effects of the nutrition and health education programme of the Integrated Child Development Services on the levels of nutrition and health awareness and hygienic practices of women, and on the
nutritional status of children. Education programme was carried out by Anganwadi workers in 12 sessions (one per month). Intervention group was consist of 300 children and their mothers while another 100 children and their mothers were treated as the control group. Results of the study showed that mothers in the intervention group had appreciably higher scores on nutrition and health knowledge, and hygienic practices than the control mothers. This study proved the importance of an education programme in improving the nutrition and health knowledge of rural mothers.

Gupta et al., (2009) conducted a study to determine the nutritional awareness of 50 school going rural girls of age group 13-16 years in Kurukshetra district prior and after participating nutrition education about health, nutrition and food habits. Nutrition education was delivered through audiovisual aids, demonstrations and lectures, for the duration of three months. Pre and post level of attitude, knowledge beliefs and practices about good nutrition was judged by taking interview and using questionnaire method. To observe the level of awareness, scoring system was developed which consists of scores from –1 to +1 depending on each question. After completion nutrition education, a considerable improvement in nutritional knowledge was observed and quantum of improvement was 1.67 times. In this study certain gaps in their attitude, knowledge, and practices was identified prior to imparting nutrition education. It was concluded that nutrition education is an useful measure for the improvement of food habits and food selection of the adolescent girls. The main factors responsible for poor nutritional status of the adolescent girls were poor food habits and unawareness. As the adolescent girls are future mothers, such awareness programmes should be planned to improve the health of adolescent girls which will also influence the future generation.

Rastogi et al., (2011) designed pragmatic nutrition awareness program for pregnant mothers to compare and observe the effect on birth weight of the newborn with a control group who did not receive nutrition awareness exposure. In this intercession trial of an antenatal care (ANC) program was conducted among 53 pregnant women. Awareness was provided to the participants through face to face interview and informational literature in the local language. A statistically considerable improvement in birth weight of the newborn was noticed in the intervention group. This group were made aware about required nutrition during pregnancy. Reduction in incidence of complications related with pregnancy was also recorded in the intervention group. Awareness about nutritional requirements during
pregnancy and proposing the pragmatic ways to meet up them was revealed to be one promising and successful measure to deal with pregnancy-related nutritional problems. Study showed the effectiveness of the intervention for underprivileged regions of India with scarce health care relief and lower socio-economical standards.

Different reports showed that women cover about two-thirds of the global consumer expenditure. Education, better ways to nurture themselves and their families, amplified success as executives and entrepreneurs, elevated earnings, and better ways to manage and leverage their accumulate wealth are key factors.

Rani et al., (2013) had performed a dietary intervention to combat anaemia with a functional food supplement amongst coffee plantation labourers. The trial was carried conducted in three phases. The personal background of the labourers was measured in the first phase. In second phase, the nutritional and health status of the labourers was assessed with the help of 24 Hour Food Recall method and keeping record and weighment of cooked food consumed for three consecutive days. The clinical and biochemical profile were also studied. Third phase included implementation of dietary intervention with soup incorporated with a nutrient rich nutraceuticals food supplement spirulina. The supplementation was given for a period of 120 days. The subjects were grouped into experimental and control. The experimental group was administered with soup incorporated with spirulina and the control group was given plain soup. The impact of intervention was reassessed in similar working conditions on the biochemical and nutritional profile of the labourers this study confirms the significance of dietary intervention with functional food supplement spirulina.

Sharma et al., (2013) overviewed the Functional Food market in India along with the opinions related to the marketing of functional food products. Their paper provided that urbanization and globalization are driving the Indian consumer markets and the need for a healthy variant of food is felt by the consumer who is exposed to an unhealthy lifestyle. Functional Foods, as one of the solution, are being introduced by the food marketers in various categories like dairy products, edible oils and breakfast cereals. The market is growing at a fast pace and presents a tremendous growth opportunity for food companies.

The global counterpart of common Indian woman is considerable because today’s women are more aware about the products they purchase and the necessity of their family members. The middle-class average Indian housewife has ambition; she
wants the best for her family. Ultimately women are largely responsible for the household chores and taking care of their children.

Many Functional Foods may be promising for community health. There is concern that the endorsement of Functional Foods and structure/functional claims may not rest on insufficiently strong scientific evidence. Confusion exists among claims declared for foods and those applied to dietary supplements. The explosive market growth, marketing enthusiasm, lack of standards & regulation, research and developments and quality assurance will play vital role in success or failure of the Functional Foods.

Mounting evidence supports the observation that Functional Foods contain physiologically active components either from plants or animal sources, may enhance health. Research into functional food will not advance public health unless the benefits of the Functional Foods are effectively communicated to the consumer.

Review of literature suggests that Functional Foods related studies are quite few in Indian contexts. These studies have gained much importance in West where health consciousness and concern are given most priority. The nutritional awareness creation program for Functional Foods is almost nil in Indian scenarios. The entire review of literature also suggests that no study in the state of Chhattisgarh has been ever performed to assess the impact of awareness program for women on consumption of Functional Foods. Therefore it was thought worthwhile to take up this investigation.