

CHAPTER – II

Contextual Reference

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2.0. Introduction

This chapter deals with the studies related to the importance of teaching chemistry at Secondary level curriculum, hidden curriculum, models of teaching values. The literature widens knowledge, deepens the understanding and builds up ideas and insights for better perspective, therefore it is an essential aspect of any research. In this chapter the literature is reviewed under six headings, namely studies related to Teaching and Learning of Chemistry, Food and Nutritive Value, Health and Hygiene Value, Medicinal Value, Environmental Value, and Hidden Curriculum.

2.1. Studies related to Teaching and Learning Chemistry

Hargrove Tracy (2003) worked on “Science Note-books and tools for increasing achievement across the curriculum”. Results showed that the Science note books exposed students thinking and understanding.

Idorenyl, N.M. (2004) made an attempt to study about “Self-concept, attitude and achievement of Secondary school students in science”. This study showed that the academic achievement in science was significantly predicted by their attitude, academic self-concept and science self-concept.

The study of Battakins (2003) emphasized “The effectiveness of Student Team Achievement Division (STAD) in teaching 10th grade chemistry.” The student teams trained in assessing the achievement in

chemistry. This is more effective than traditional, in teaching 10th grade chemistry.

Saskatchewan (1988), did research on "Student assessment in Chemistry". 30 final examination papers in Chemistry were prepared and administered by Saskatchewan with continuous open book system of examinations. Results revealed that the student's assessment in Chemistry was good in the open book system of examinations when compared to the traditional system.

Adesoji F. A. worked on "Student and teacher related variables as determinants of secondary school students academic achievement in chemistry in Lagos state in Nigeria." The sample was two hundred and one students of senior secondary school in Lagos state. All chemistry teachers from the selected schools took part in the study. The administration and collection of all the necessary information were done during the normal class periods. The results revealed that 7.6% ($R^2 = 0.076$) of the total variation is increased in students achievement. This was accounted by the independent variables, gender, age, study habit and mathematical ability, qualificationis considered in the study. She had studied the academic achievement of students.

Sharma (2004) did "A study on academic achievement". This study showed that the income of the various caste groups and student's family size did not influence the academic achievement of students' family size.

All the commissions have given stress on teaching, methods, evaluation, text-books, and training programmes to teachers in chemistry. All India Seminar on the teaching of Science in Secondary Schools (1950), Secondary School Commission (1953), Indian Parliamentary and Scientific

Committee (IPSC, 1962), UNESCO Planning Commission (1963 - 64), Kothari Commission (1964-66), Science Education Programme (NPE, 1986) and National Policy of Education (NPE, 1986), laid stress on the role of teaching Science in schools without referring food and nutritive, health and hygiene, medicinal, and environmental of chemistry teaching.

Tewksbury (2005), worked on "Teaching methods in science course in U.S". John. Richardson, Cehoon, and James Rutledge worked on the materials, limited to books, magazines, pamphlets, motion pictures, filmstrips and slides and laboratory and demonstration equipment plays an important role in teaching of science.

Kumar (2004) did on "A study on the impact of inductive thinking model on the learning of Physical sciences at secondary school level". The investigation concluded that inductive thinking model in teaching was superior to ordinary classroom practices like verbal illustration and demonstration in learning Physical sciences.

Anne M. H. (2007), worked on, "Carbon Monoxide Detectors." He explained why Carbon Monoxide is dangerous to health and how carbon monoxide detectors and alarm work. Regina Bailey, wrote an article "Carbon Monoxide, and carbon monoxide poisoning". Carbon monoxide is a toxic gas. How carbon monoxide affects the health? Hidden chemistry of Carbon Monoxide creates awareness among students.

Majority of the researches stressed only on the achievement, few researches on methods, very few researches on Models of teaching, only one research on the inculcation of awareness on the hidden value of chemistry teaching were identified from the above contextual literature.

2.2. Studies related to Food and Nutritive value

Aristotle defined, "Education is creation of sound mind in a sound body." Sound mind and sound body refers to a healthy and normal mind and a healthy and good physique.

Janet Novotny and his colleagues of the USDA explained that when an average person eats almonds receives only 128 calories nper serving rather than 170 calories "On the label".

A study by RobDunn (2012) in "The Hidden Truths about Calories Guest Blog", explains different kinds of foods have different number of calories. Fat has been estimated nine calories per gram, whereas carbohydrates and proteins have four; fiber has two. Peanuts, pistachios and almonds all seem to be less completely digested than their proteinlevels.Readymade food stuffs such as coffee, tea, fermented beverages, coloredfood stuffs, wine, beer, brewery, spices and drugs are readily availablein the market creates health problems. The food can measure through calories. Different kinds of food have different number of calories.

Barbara Orland did research on"Chemistry of everyday life". The research mostly included on nutrition and food, drugs, detergents, colours and bleaching agents, heating and lighting. The causes of the structure of substances, organic compounds,substances for nutrition, spices and its use,adulteration of food and consumer goods.

"The secret ingredient in the Orange Juice food" by Renegade (July 29, 2011), expressed about the natural juices, like Tropicana available in tins in the market, though the fruit juice gives health, but now-a-days chemicals are found in pretty much in all kinds of food. Panicking and saying Orange juice is unhealthy just because chemicals does not sound reliable. Says even

the most “Natural” packaged foods have hidden poisons, are sensitive systems are affected more than others. Natural flavor is another scary chemical additive that is essential, just as bad as artificial flavor.

“Reducing childhood obesity” by Academy of Nutrition and Dietetics (1995-2013), explains a key to reducing the prevalence of childhood obesity is good nutrition- but its more than simply eating the recommended number of servings from all food groups. Parents and care-givers play a vital role in children’s nutrition: they teach children about healthy foods, practice what they teach and make sure physical activity is incorporated into each day. They learn more about how healthy eating and active living can eliminate childhood obesity. <http://www.eatright.org/ADAPAC/>.

Another review by Academy of Nutrition and Dietetics (November 2012), on “Food and Nutrition Topics,” explains every day, we were faced with an abundance of food and nutrition information and choices. Whether it’s maintaining a healthful diet while eating in the favorite restaurants, navigating the shelves at our local grocery store, or fueling up for an upcoming 5k run making the right book and nutrition choices is a necessary part of every one’s daily life. Eat slowly about 20 minutes for the brain to get message from the stomach that are no longer hungry. Fast eaters often are overeaters, while slow eaters tend to eat less and are still satisfied. Calcium is important at all ages, but especially for growing bones. To get more calcium, drink low-fat or fat-free white or chocolate milk or add a slice of cheese to their sandwich.

“Dietary supplements” by Academy of Nutrition and Dietetics (1995-2013) in the popular diet reviews, says most people don’t need supplements. Eating a wide variety of nutrient-rich foods is the best way for most people to

obtain the nutrients they need to be healthy and reduce their risk of chronic disease. There are some people who may need supplements to help meet their nutrition needs. Then the doctor or registered dietician might recommend a Vitamin mineral supplement on a restrictive diet, eating less than 1600 calories per day.

“Pop corn packed with anti-oxidants, hidden health benefits” - U.S.A.Today (May 25, 2012) by Maurenlinke and NanciHellmich., says “The hull is where the most nutritional goodies (Polyphenols) are not the white fluffy part”. Popcorn has an antioxidant called Phenolic acid that found in beans, Rice, Corn, Wheat, barley and many other grains which exhibits a wide range of therapeutic effects against cancer, diabetes, cardiovascular and neuro-generative diseases largely because of its strong antioxidants and anti-inflammatory activity. Popcorn is not an alternative to vegetables and fruits which contains polyphenols along with vitamins and minerals not found in popcorn.

Silvia Martinez in an article on “Why Coffee keeps you awake?” explains that the caffeine in coffee operates using the mechanisms of amphetamines, cocaine, and heroin to stimulate the brain, though with milder effects. It manipulates the same channels as the other drugs, and that is one of the things that give caffeine its addictive qualities. The chemical adenosine in human brain activates by taking a big cup of coffee, the caffeine also increases the dopamine, which is associated with the pleasure system of the brain, providing feelings of enjoyment reinforcement.

She also wrote an article “About Commercial milk”. She says many types of milk are sold in market namely Homogenized, Pasteurized, Ultra-

pasteurized, (UHT), Skimmed, evaporated, sweetened condensed and powdered milk. It is healthy to drink milk, but the commercial milk is not the same after those processes. In Homogenized milk fat particles are dispersed uniformly. Ultra-pasteurized milk is hard packed milk including vitamin A and other soluble vitamins are removed in skimmed. Sweetened and condensed milk is having very calories. Water fully evaporated in powder milk. It is healthier to drink the original milk instead of all these types of milks.

Kinigema S. worked on, "The effect of low temperature storage on the formation of total volatile bases and Tri-methylamine as Indices fish spoilage". The results shows that the extent of formation of total volatile Bases or Total volatile acids of the compounds with respective to time may be exploited as an alternative for diminishing the incidence of fresh food poisonings. These two researches indicate that how the food spoils at low temperature storages. Spoilage depends on the storage basing on the temperature.

Vandana Shiva (2005), worked on "Hidden Hazards of Adulteration oils". Resultsshowed that adulteration of oils were more dangerous to health as it gives bad effects on the working condition of liver.

Barbara. (2006), conducted a research on "A heart-healthy diet is the best way to eat:",says avoiding harmful saturated and Trans fats, limiting empty calories and consuming plenty of vegetables, fruits, whole grains and legumes.

Mary L.G(February 2006), emphasized on "Food labels", which provide more than just nutrition facts. They also tell what was in a packaged food (i.e., the ingredients). Some food labels also state, whether the food was organic, and certain health claims.

In the United States, “Food and Drug Administration (FDA) and the Department of Agriculture (USDA) worked on “who decides and what information goes on a food label”. Stated that food labels show the same nutrition and health information, allows consumers to compare different foods and make the choices that were right for them. Food labels unable to tell what foods to eat. That was the decision of a person! But helps to find out the taste of good foods, and treat the body right.

In an article in National Geographic News, William Hopkin’s commented in “Aquatic impacts and Protection”, focuses on how coal combustion liberates trace elements that were subsequently transferred through food chains.

ICMR conducted a seminar in 7th International Congress held in 1966 on “Nutritional Care of the infants and preschool children,” the following projects and researches were presented.

Preschool children malnutrition among children of 1 to 15 years was considered as protein deficiency corrected / overcome by the supplementation of concentrated sources of protein was advocated as a preventive measure of the hidden value of the nutritive food. A multicentre study conducted by ICMR on the dietaries of preschool children also given stress on this. Many researches stressed and demonstrated on protein malnutrition. The following researches explain that the judicious combination of cereals and legumes raises the protein quality.

Patwardhan (1961) explained that a mixture of rice and red-gram, or Bengal-gram or green gram or black-gram possessed a higher protein. He had worked on young children of 1 to 5 age using rice and pulses and skimmed milk, resulted that the growth of the child was increased.

Daniel et al (1964) discussed in a study where young children were fed with peanut flour very long period of time of 75 to 150 grams per child daily and nitrogen retention was observed. Resulted the peanut flour is equal in value to milk mixtures.

Doraiswamy et al (1964) expressed that a daily supplement of 40 grams of protein food based on a 1:1 blend soybeans and peanut flour for a period of 6 months brought a significant increase in height and weight of preschool children.

Another researcher Rajyalakshmi (1966) explained at the 7th International Congress on the education in “The nutritional care of the infants and preschool children with vegetable foods”. Cereals and pulses used in the form of sprouting, roasting, and fermentation, resulted that the gain of weight was more in children. Inclusion of various legumes and animal proteins can improve the condition of children suffering from malnutrition and underweight.

Swaminathan et al (1973), emphasized on programmes, where several recipes were tested for their, “Acceptability in the feeding programme of the children and the adult community,” It was observed that the preparations, wheat and green gram laddoos were best accepted, followed by the groundnut-wheat biscuits and sweet porridge. The wheat and green gram laddoos were selected for the feeding programmes. Solving protein malnutrition, by developing a protein rich food

The vegetable mixtures were already well developed in the year 1966. These mixtures were based on the well known principle of mutual supplementation of mediocre proteins. In the year 1965 (Asfour et. al), in Laubna, 24 infants were tested, who were attending a well baby clinic. Each infant (5 months) received 100. gms. of vegetable mixture supplement

to mothers milk, till the age of one year. The acceptance, tolerance, and growth were favorable in EG than CG.

UmeshKapil (1990) conducted a study on “ICDS has been proved to be a successful model for the delivery of early childhood health, nutrition and education services. It has limitations and short comings but they were manageable, being tackled continuously. The expansion of programme made it clear that it was highly desirable that monitoring of programme should be decentralized for effective implementation.

Jayalakshmi (1991) conducted a study on “Integrated approach of nutrition invention and education”, in the ICDS programme. It had got beneficial effect on its subjects due to the integrated approach of nutrition invention and education. The quantity of supplements given to children seems to be inadequate to substantiate the normal growth pattern.

The Laubina vegetable mixtures were developed in the Middle East. Donald, (1966), extensively tested both in laboratory experiment and in normal and malnourished infants in the community.

The above researches are on the growth and development of the pre-school children and on infants and nutritive values of food. Few researches are there on the awareness of values of foods. But there were no researches on the Food and nutritive value of various foods.

2.3. Studies related to Health and Hygienic value

Chemistry is an exciting experimental science which lets us to understand our world and makes our life easier. Chemistry in our everyday life colon in our body at home, in nature: in every second of our lives.

Chemistry in every person's daily activities from the moment we were born. What role does chemistry really play in everyday life. Many numbers of advertisements on soaps, deodorants, body sprays, lipstick, room-fresheners', etc are coming in media. A common man must know the toxins behind them, before using.

"Slow Death by Rubber Duck", (25 Oct, 2009)" by Rick Smith, Bruce Laurie, Sarah Dope says how chemistry of everyday life affects our health. It talks about how manufacturers sneak chemicals in toys; non stick cooking pans are scary, because the things in this book are in our everyday lives. What is so scary, the average person has only so much control over how many of these toxins, get in our system.

"There is lead in the lipstick" by Gillian Deacon (1 Jan 2011), in his reviews, "toxins in our every day body care and how to avoid them". By the time she heads out the front door, the modern woman has spirited and slathered herself in more than 127 different chemicals, many of them more toxic than beautifying. These are completely eye-opening and enlightening. She says that she had no idea on the amount of toxins and carcinogens in our everyday body care and is appalling. She says her current beauty products were going in the trash. Scariest book ever, just throw out half the stuff in her bathroom, she had a feeling some of the stuff, here was exaggerated a bit, all for lessening the chemicals in life, but this is getting ridiculous.

"The Healthy home on simple Truths", explained to protect our family from hidden household dangers. In the Healthy home, a father and son – Dr. Myranwentz, well-known microbiologist and founder of the USA NA corberatam and Dave Wentz, CEO of the USANA Corporation, take readers

on tour of a specific home for a look at the surprising health risks posed by the everyday products and behaviors of a modern family. Beginning the bedroom and ending in the garage and backyard, readers about the degenerative effect of toxins in the home and receive simple solutions to help, and minimize exposure with any foregoing convenience. The healthy home is not a comprehensive, on modern health hazards, nor is it a treasure on eco-con living. This book focuses on the most easily lessened or eliminated busy problems that can most easily be lessened or eliminated. Busy parents who suspect that they should be doing more to protect family but don't know where to start with about practical changes they can make in the next 15 min, 15 days or 15 months to create a heaven for healthy living.

“Why onions make you cry” (1 Jan 2011) by Silvia Martinez explains the chemical compounds in the onion cells contain sulfur, transforms into a more volatile sulfur compounds released into air by cutting them, and reacts with the moisture in air forms sulfuric acid produces a burning sensation and irritation in our eyes. The brain reacts by telling more tears to dilute the irritating acid. So we cry. There are some tricks to make onion-dicing less problematic. Chopping onion under cold water, the volatile sulfur compound reacts with water before reaching eyes. Freezing onions before cutting, the cold temperature slows down the reaction of the volatile sulfur compounds stop crying.

“How soap cleans” (1 January 2011), from the internet on “The chemistry of life” by Silvia Martinez explains that the soap molecules with a ‘head’ which likes water” Hydrophilic” and a long chain that hates “Hydrophobic.” In washing an oil cloth with soap, an emulsion is formed in which the oil particles become suspended and liberated in the water. When in rinsing in the water, the emulsion is taken away the oil from the cloth.

Brunswick (1989) had conducted a study on "General health of children of 12 to 18 years", using interview technique and enquiry had collected the information from 21 boys and 20 girls. Students expressed that eating right kind of food, not smoking, and sleeping for sufficient time leads to good health.

Rajeswari, (1990) studied on "The secondary school children and college students in Vellore town in Tamil Nadu". The focus of the study was to identify the views of higher secondary school children and college students about health, health behavior, illness and illness behavior. The need for balanced diet was given less priority by the adolescents, who were usually healthy regarding personal hygiene, except for long nails fashion conscious among the students.

In order to improve the safety of foods produced by "cottage" industries, including street vended, food WHO has advocated the application of the hazard analysis critical control Point (HACCP) system to identify and characterize possible hazards to establish priorities for intervention and control May (1993).

"(HACCP) Hazard Analysis Critical Control Points of vending operations at a railway station and a bus station in Pakistan", was analyzed by Bryan et al., (1992). Critical Control Points varied with food, preparation steps and duration of holding and display, but in most cases they were holding and reheating. "Hazard analysis of a street vender chat in Pakistan" was also done by Bryan et al., in (1992). Staphylococci reached the cooked products during pecking, cutting and handling. These bacteria increased up to 10 while the contaminated foods were hold for several hours' counts up to 105. Bacillus cereus was isolated from the coked dough after a 6 hour a

longer holding period. Large number of coli forms bacteria and aerobic mesospheric colonies were isolated from all food handling after cooking and holding on display.

According to Bryan et al., (1992) holding at ambient temperatures and free ring are the critical control points of the intercom mix. "Hazard and Critical Control Points of foods preparation and storage in home in a village and town in Pakistan", was studied by Bryan et al. in (1992). Hazards were primarily associated with holding the foods after preparation, critical Control points are cooking, manipulation of foods after coking holding cooked foods reheating.

According to Bryan et al., (1993), The HACCP approach consists of the following successive actions.

- (a). Analyzing hazards, assessing the severity of outcomes, if hazards are not prevented or controlled and estimating risks of occurrences of successive hazards.
- (b). Determining critical control points (A Critical Control point is an operation practice, procedure, process or location) at which a hazard can be delimited prevented or minimized.
- (c). Selecting effective preventive or control measures and appropriate criteria.
- (d). Monitoring critical control points.
- (e). taking prompt corrective actions when results of monitoring show that a hazard exists or that control either has been or being lost.

(f). Verifying that monitoring is being done effectively and the HACCP systems is in effect.

In Australia a project was conducted by Desmaxhalor (1993), on “The food safety Control procedure among street food outlets in the central business of Kota Bharu”. To assessthe aspects of food safety control procedure employed. A HACCP analysis of the preparation of food for distribution via street hawkers identified prolonged ambient temperature storage of food as a major critical control point. Hazard analysis of Critical Control Point for all food groups indicate that proper handling, impure water and environmental factors were mainly responsible for deterioration of food quality. (Chakravarthy, 1993).

According to Dayue (1993) on “Cleaning and disinfection of containers and utensils” and avoiding of food contacted with hand, keep storage temperature at less than 5⁰ C and selling out the products in a short time are the critical control points of stewed chicken.

Hemamalini (1940), explained that “HACCP analysis of plantain bajji”, indicated high coli form count (>1,00,000cfug) only during handing procedures and during display and samples tested fresh from the pan was free from micro-organisms.

Institute of Natural and Modern Cosmetic, (2005), gives information on herbs in “The Useful cosmetic Herbs for Skin care, Hair care, Beauty care, and toiletries.” This book provides the information on all the herbs which were either used in the past still used for their cosmetic and related applications from various sources. Discussions include cosmetic and medicinal plants used for skin , hair care, dental and oral care, soaps and detergents, deodorants, hallooing, body coloring and skin painting, foot and

hand, and lip care, aromatic and medicated baths, aromatherapy, and color cosmetics, plants from the Americas, Europe, Africa, Asia, Australia, the Pacific islands and India are included. The book is set up in alphabetic order by genus, with the family noted, complete taxonomic identification along with common names in Various languages, the plants distribution, applications, the category of cosmetic and action or uses such as “astringent, bacterial.”

Majority of the above researches shows about healthy, hygiene, food safety control procedure, useful cosmetic care, how modern cosmetics, boutiques and colors affects the health, why we need HACCP values available on the market products and on useful cosmetic herbs.

2.4. Studies related to Medicinal Value

Living things require elements for their growth. The major elements are sodium, potassium, iron, phosphorus, sulphur, carbon, oxygen, hydrogen, calcium, manganese etc. i.e. the importance of manganese is a mineral that is found in several foods including nuts, legumes, seeds, tea, whole grains, leafy green vegetables. It is considered an essential nutrient, because the body requires it to function properly. People use manganese as medicine.

Manganese is used for prevention and treatment of manganese deficiency, a condition in which the body doesn't have enough manganese. It is also used for weak bones (osteoporosis), a type of “tired blood” (anemia), and symptoms of premenstrual syndrome (PMS).

Manganese is sometimes fruits contain an especial kind of chemical compound included with chondroitin sulfate and glutamine hydrochloride in multi-ingredient products promoted for osteoarthritis. Manganese is an essential nutrient involved in many chemical processes in the body, including processing of cholesterol, carbohydrates, and protein. It might also be

involved in bone formation; manganese is “hidden” in some supplements. Certain supplements, including those commonly used for osteoarthritis (e.g., CosaminDs), contain manganese. When using these products, it’s important to follow label directions carefully. Consuming more than 11mg per day of manganese could cause serious and harmful side effects. Androgenic-anabolic steroids were used with particular success to virilization of adolescent girls and female athletes. (Doping in Sport Symposium: Werner W. Franke and BrigitteBerndonk Hormonal doping and androgenization of athletes: a secret program of the German Democratic Republic government Clinical Chemistry1997;v. 43, p1262-1279.

“Vegetables and colors” by Silvia Martinez in her article, an object is colored because of the light (having wavelength) that it reflects. Strongly colored vegetables and fruits contain especial kind of chemical compounds called carotenoids. These compounds have an area called chromophore which absorbs and gives off light, generating color that we then perceive. The chromophore is formed by a sequence of linear carbon-carbon double bonds (C=C), remains the atoms closer to each other. Bigger the number of bonds conjugated, bigger the light absorbed with more wave length appears to red.

Tomato is red as it has carotenoid lycopene, contains 11 conjugated carbon-carbon double bonds. This compound is generated by the plant to protect itself from the air oxidation. So it is good antioxidant useful for us too, protecting our cells against the action of free radicals (potent oxidants), which are one of the main responsible of cardiovascular diseases, cancer and aging. The pigment in the beta-carotene, contains 9 linear conjugated double bonds having orange (smaller wavelength than red) color. This is also a potent antioxidant, transformed our body into Vitamin A, very important for the maintenance of healthy skin, good vision and a robust immune system.

Everywhere on earth people use home remedies. In some places the order of traditional ways of healing, had been passed down from parents to children for hundreds of years. Many home remedies have great value. For many sicknesses, time tested the remedies work aswell as modern medicine or even better. They were often cheaper and in some cases they were safer (Werner, 1934).

Silvia Martinez (1st January 2011) on "What is cholesterol?" explains the cholesterol is a fatty substance found in the human blood. The cholesterol comes from liver production; meat, fish dairy products of diet. Bad cholesterol (LDL) deposits cholesterol on the artery causing, higher risk of coronary heart dieses. HDL cholesterol levels are lower in smokers, People who eat lot sweets leads to overweight and in active.

In 2002 the US Geological Survey sampled streams in 30 states for to say, "Do not flush medications, Vitamins and other supplements down the toilets unless noted differently on the medications packaging." Drugs flushed down the toilet were found in the water supply, and flushing them only adds to the environment burden. Water from 139 streams were tested. 80% had measurable concentrations of prescription and nonprescription drugs, steroids, and reproductive harmones. Small amount of drugs have been found in some drinking water.

The Drug enforcement Administration in US advised to follow the most medications as follows:

Remove the drugs from their original containers. Mix them with water and put in coffee ground, sawdust, charcoal, or powdered spices. This step makes the medication less appealing to pets and children, remove the labels or scratch on empty bottles in the trash.

Some medications pose problems for disposal because they are toxic or they carry a high risk of misuse to pets and children. They are chemotherapy drugs returned to clinic, as these are extremely dangerous drugs cause damage if they are even touched, never flush them down the toilet.

The FDA of US issued a warning to health providers and caregivers on Fentanyl (Patch), on April 19,2012, as Fentanyl is a powerful prescription pain reliever. Fentanyl patch is a chronic pain. In its warning, the FDA that at least 10 children have died and 12 have hospitalized after they were exposed to the patches for instance.

Narcotics: In some states, such as California, narcotics are considered hazardous waste and cannot be thrown in the trash. A drug recycling center cannot accept narcotics unless a law enforcement officer is present.

“Did you know,” Acetanophen (Paracetamol), marketed as Tylenol and found in many over-the-counter cold and cough remedies, is the most common cause of drug overdose in the United States.

“How to dispose of asthma inhalers.” A disposal problem of the device of Asthma inhalers that deliver medicine directly into lungs of people (by a propellant), who have asthma or other chronic diseases. The FDA called for a phase out of CFC’s (Chloro- fluorocarbons as a propellant) in inhalers because of concern about their impact on the ozone layer of the Earth’s atmosphere. Some inhalers contain CFC’s. These inhalers may be considered hazardous waste, and should not be thrown into a fire or punctured or to give to local trash or recycling center.

Kim, Sung.and Potter worked on “Medicinal efficacy of 27 plants utilized as temple food in traditional Korean Buddhism”. They studied from

1977 to 2002. Twenty-one plant parts were utilized as food in 42 different preparations. Approximately 82% of the plants studied had medicinal effects, with wide range of efficacies, of the medicinal plants, 52% were used for digestive problems, circulatory illness, and respiratory diseases.

The Irula Tribal Women's Welfare Society (ITWWS) was a non-governmental Organization established in 1986 to promote the traditional knowledge of medicines that they possess and for the empowerment of Irula women, with the aim to address public health needs and the issue of protection of medicinal herbs and forest resources, the organization brings together herbal doctors and practitioners of traditional medicine. ITWWS is committed the cause of promotion Irula cultural and indigenous expertise.

In Health Action Report (1995) magazine, was reported that in Ayurveda measles was due to variation of kapha and Pitta. Before appearance of rash, the following Ayurvedic preparation should be given 4 times a day sarramakihikebhasma, kasturibhairava 12mg, shringabhasma 10 mg. sowbhagyavate 240 mg. and this mixture had to be given with the juice of bitter guard and honey in order to cure measles.

Daisy Francis (1996) explained in "Curing of diseases" that Arishtam prepared of Hibiscus Rosa sinensis (Shoe flower) was taken in any form was recommended. Buds or flowers or flowers boiled in milk were taken on empty stomach. Decoction, juice or powder of the bark of Ashok tree was also recommended for dysmenorrheal. Pulp of Alovera with jaggary or sugar candy on empty stomach is recommended for leucorrhoea. Leaves of drumstick tree in any form or decoction of the stem cockle's cordifolius is recommended. Lawsonialba (Gorintaku in Telugu) was used for Menorrhoea. Grind the leaves together and make pill – one tablet in the morning and one in

the evening on empty stomach for 3 – 7 days as per the need is recommended. The juice or decoction or powder of the same can be used. One tea spoon of coriander powder mixed in glass of rice wash water is recommended, one glass per day. Coriander juice flush out the toxic elements from the kidneys.

Home remedies alone are followed for many of the illness like cold and cough, ear-ache, tooth-ache, headache, sore mouth, cuts and wounds, eye infection, indigestion, constipation, boils, scabies, bleeding gums and dysmenorrheal. Preferring home remedies are mainly because of local availability and low cost and passed from generation and their confidence. With reference to use of various materials for different type of illness, all the indigenous materials are produced from the locally available plants. The indigenous materials used and method of preparation of medicines are obtained mainly for illness such as fever, chicken pox, measles, cold and cough, stomach ache, fever indigestion, vomiting, toothache, headache, cuts and wounds, scabies, boils, sores in mouth, arthritis, diabetes, dysmenorrheal, white discharge and jaundice.

All these medicines were mostly self prescribed and prepared and were used only for cure but not for prevention. None of the prepared medicines were stored beyond a day. They were freshly prepared during illness. Village practitioners existed and all of them are highly experienced.

Ziyaurrahman.Saife.Sikander,.andDehghan, (2006), worked on “Herbs for diabetes” Mellitus. Plant derivatives with anti-diabetic properties had been used to folk medicine and traditional healing systems around the world. Modern medicines despite offering a variety of effective treatment options can have several adverse effects. Many modern medicines used today also had

natural plant origins. From ancient times, some of these herbal preparations had been used for treatment of diabetes. The paper reviews the herbs that have anti - diabetic activity and that had been scientifically documented with their proposed mechanism of action.

Bhalla. (2005), on "Indian Eucalyptus and their Essential oils," in Health Action Report Magazine, given the information on the Essentials, distilled from the leaves and sometimes from the fruit, were valuable to the medical, industrial and perfume traders grows in all areas of the country. Few drops of Eucalyptus oil putting in boiled hot water, and steaming by face, instantly cures the cold. Applying the Eucalyptus oil on the back, heals the water in the lungs. In conclusion, it may be said that medicine in India gradually dissociated itself from superstitions and exorcisms and developed into a scientific medicine long before Hippocrates. The pace continued till Gupta period after which compilations and commentaries came (Sharma. 1992).

India had different systems of medicine like Ayurveda, Siddha, Unani, homeopathy, nature cure, yoga, folk medicine or native medicine including herbal remedies and modern system of medicine. i.e. Allopathy which were in vogue. The rural folk depend on naturopathy which was known as grandparent remedy and it was in practice from ages. Unani medicine and homeopathy had come to India from other lands in the more recent times over the countries. Allopathy or western medicine however draws its inspiration and information essentially from the west (Jaggi, 1969). All the systems of medicine complement each other rather than contradict one another. The importance of health practice was to prevent disease, promotion of health and improvement of the quality of life of individuals and groups communities.

Good health is defined as “A state of complex Physical, mental and social well being and not merely an absence of disease or infirmity. (WHO, 1948)

The US Geological Survey on “Do not flush medications, Vitamins and other supplements down the toilets unless noted differently on the medications packaging.”, Silvia Martinez (1st January 2011) on “What is cholesterol?” “How to dispose of asthma inhalers.” By FDA, “Did you know,” acetanophen (Paracetamol),

The above researches stressed mostly on home remedies, vegetables on health, and on some medicinal plants and their uses in curing the diseases. Usage of home remedies by the material in and around the houses gives no side effects. By using fruits, vegetables, herbs, and some locally available materials in the houses some diseases can be prevented and some diseases can be controlled and some diseases can be cured with little chemistry background.

2.5. Studies related to Environmental value

Environmental education is a process to promote the awareness and understanding of the environment and its relationship with man and his activities. It also aimed at developing responsible action necessary for presentation, conservation and importance of the environment.

The International Union for conservation of Natural and natural resources (IUCN) commission of Education, in the international working meeting on environmental education in the school curriculum held under the auspices of UNESCO in Paris in 1970 had defined “Environmental Education”,

as the process of recognizing the values and classifying the concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness of man, and his culture and his bio–physical surroundings. To safeguard the natural environment from the above constraints environmental education is to be imparted to each and every citizen of the world. Organization of American states conference on Environmental Education, 1971 stated that “Environmental Education involves teaching about values judgment and the ability to think clearly about complex environmental problems which are political, economical and philosophical.”

According to Connect (1989), Environmental Education is the corner stone for long term environmental strategies for –

- I. Preventing environmental problems
- II. Solving environmental problems which arise or occur
- III. Assuming environmentally sound sustainable development.

Thus environmental education is a pragmatic response to the defacement of the environment. Environmental Education is a kind of education which seeks to make pupils fully aware of the problems connected with their environment, to tackle these problems with a sense of responsibility and with ethical skills which enable them to contribute their solutions along with other members of the community. Alarm about the pollution of environment was raised by ecologist in the technologically and scientifically advanced nations. A survey of the literature reveals that environmental education as an independent field of study arrived on this world scene in the early seventies. But the roots of environmental education can be traced back to the history of human civilization, the story of how man gradually becomes aware of his surroundings. In the early stages of evolution of man, the awareness of environment was limited to his understanding the various process of nature

by using resources to fulfill his basic needs with better awareness, there is a gradual change in man, from continued with the establishment of civilization.

The NCERT (2001) had developed a Training module for Southern Region, on Environmental Orientation to School Education in 2001. In this, importance was given to the inculcation of values such as Food and Nutritive value; Human Health and Hygiene and Environmental values among the school children. So the researcher has taken these values inculcation as a piece of her research work. Environmental Education has been recommended as one of the core curricular concern of National Policy on Education–1986 and reviewed in 1992. RIO conference on ‘Environment and Development’ organized in 1992 also emphasized the importance of environmental education in a big way and stressed the need for sustainable development. Considering the relevance of environmental education, National Council of Educational Research and Training (NCERT) had included environmental education as one of the major concerns in school curriculum cutting across all disciplines.

Bibhuti Narayan Biswal (2003) emphasized in his project work on “A study on hazards of chemicals used in organic qualitative analysis part-I chemistry laboratory in schools,” that the laboratory is the unique place for the students to verify the principles of science and to build scientific aptitudes and developing interests. In his findings he emphasized that the schools should maintain better laboratory environment as well as greater economy of the laboratory chemicals to minimize the harmful and hazards of chemicals in their surroundings. This was an important finding and the students must know about the harmful and hazardous chemicals usage in their surroundings.

The project, "Pilot project on Environmental education in school system (EESS, 2004, 2005)", was earlier launched with the basic objective of strengthening environment education in the formal school system. During phase-I the EESS project was implemented in 8 states A.P., Assam, Goa, Jammu and Kashmir, Maharashtra, Orissa, Punjab and Uttaranchal on a pilot axis. Under phase-II, one hundred schools in each state were selected for pilot project implementation. Highlighted on the activities like development and printing of educational materials including text books, training of master trainers, and training of teachers, introduction of Green text books in these schools etc., was completed in the seven states. In all the states the SCERTs took part in Greening the text books, training of teachers at all levels to implement environmental education in all the selected high schools in the selected districts.

Ravindranadhan (1996), undertook research on MHRD project on "Environmental components in school system". The project incorporated environmental components at school level. He surveyed different communities for identification of specific local environmental activities. He had consulted 150 teachers, 60 administrators, and 25 curriculum planners.

Mary (2001), used Television, Radio, Newspaper, Text Books, Teachers, Library and other sources as different types of aids for collection of data from high school pupils on "Nature that cause environmental problems", and suggested thorough modification of syllabus was necessary with regard to the specific topics in the environmental issues.

"Study highlights hidden dangers in everyday products-Even the "Green ones." (3.8.2012) in Green Tech by Amy Westervelt an innovation at the interaction of health and environment. A first-of-its-kind, peer-reviewed study

published in Environmental Health perspectives today reveals an alarming number of unlabeled chemicals of concern in commonly used household and personal care products. The study was funded by Silent Spring Institute, which had 213 consumer products (in 50 categories) independently tested by Battelle Labs in Ohio for 66 specific chemicals associated with either endocrine disruption or asthma.

News papers by blogs on Canada.com in (TIFF 2012) by CanWest News Service on “Top10 most common environmental Toxins” by Dr. Joseph mercola, New York Times best selling author reported that the following toxins are among the most prevalent in our air, water, and/or food supply.

Thousands of other Toxins are also circulating that is still in our environment.

1.PCBs (Polychlorinated biphenyls) an industrial chemical is a persistent organic pollutant that is still present in our environment causes risk of cancer and impair fetal brain development, comes from farm-raised salmon, are fed meals of ground-up fish that have absorbed PCB's in the water.

2.Pesticide residues cause risk cancer, Parkinson's disease, miscarriage, nerve damage, birth defects from sources environment are food, fruits and vegetables.

3. Mould and other Fungal Toxins caused by Mycotoxin's gives risk heart disease, asthma, diabetes from contaminated buildings, food like peanuts, wheat, corn.

4.Phthalate chemicals used in fragrances and soften plastics risk endocrine system damage from plastics, plastic wrap, plastic bottles, plastic food containers.

5.VOCs (volatile organic compounds), air pollutants, to be in indoor than outdoor risks sources from carpet, paints, deodorants, cleaning fluids, varnishes, cosmetics, deodorants dry cleaned clothing, air fresheners'.

6.Dioxin's a chemical compound from the incineration of municipal waste, risks skin rashes, mild liver damage from eating commercial fats.

7.Asbestos, an insulating material releasing fibers into air causes cancer, from insulation on floors, ceiling etc.,

8. Heavy Metals like Arsenic, Mercury, Lead, Alluminium, and Cadmium risks foggy head, fatigue, damage to blood vessels from fish, vaccines, pesticides, dental amalgams,etc.

9.Chloroform. causes risk cancer, headache, liver and kidney damage from water, and food containing chloroform.

10. Chlorine. Highly toxic causes risk sore throat, blue coloring of the skin, lung collapse from industrial processes.

There are researches on environment and environmental pollutants and on hazardous chemicals in the environment. But there were no researches on secondary school chemistry teaching and on the development of awareness of environmental problems among the students. The researcher identified this as a major gap in research.

Majority of the researches show that how threat occurs in environment and lays stress on protection of environment, common environmental toxins and on hazardous chemicals. A person with knowledge of chemistry observes do's and don'ts on environment and act accordingly.The researcher identified that there were no researches on environmental value at secondary school chemistry teaching.

2.6. Studies on Hidden Curriculum

The following are some of the studies on the hidden values of the curriculum..

Jen Anyon's (1980) – worked on “Social class and Hidden curriculum”, with a sample of five schools. Results show that the schools which provided the customs, rituals, rules, routines, relationships, organizational habits, social roles, which form an important part of their socialization of students in which new members acquire the values and norms from the older members.

In the past, less attention was paid to the hidden curriculum. The study of Giroux shows that the hidden curriculum forces students to learn roles, feelings, norms, attitudes and organizational structures of the classroom and observed that the schools are not giving them enough social and civic education.

In an article “Schools worked on hidden curriculum”, Wah, Y. distinguishes schools worked on hidden curriculum from other schools. The schools were value-oriented hidden curriculum was both necessary and sufficient for personal growth, crucial for the betterment of life of others in society through reflection: formation of values determines how people act with information. Hidden curriculum shows that everyone may have different sets of values. Self- learning, reflection, a joint stream of Arts and Science, to serve and lead, respect for Chinese traditions are some fine values of Jesuit education.

The study of Eisner (1999) on “The hidden curriculum and manifest curriculum,” emphasized that the hidden curriculum was more effective than manifest curriculum, and the lessons it teaches were long remembered because it was so pervasive and consistent over many years in which the students attend school were experienced daily and firmly.

The research of Anderson.T.(2001), on “Hidden curriculum and Distance education”.focuses on unveiling the supposed “real” agenda of formal education. The distinctive physical and international context of distance–learning environments may define a different concept and experience of the hidden curriculum than that experienced by participants in traditional campus–based education.

Myles et. al (2001), undertook a study on “Intervention in school & clinic”. The study emphasized on the development of skills through hidden curriculum in middle school children. Abramovich, Sergei Brawer Peter, (2004), worked on “Developing technology-mediated entries into hidden mathematics curriculum area”. The school mathematics, as one of the key subjects, generally belongs to hidden domains of the curriculum. The knowledge of hidden concepts and structures in the mathematics curriculum can be used to extend importance of exploring a hidden curriculum framework.

Science Education necessarily contains values. John Dewey (1938), emphasized on “The experience in education referred to the collateral learning of attitudes that occur in schools”. Kay Sambal; Liz Mc Dowell, (1998), studied on “The construction of the hidden curriculum: Messages and meanings in the assessment of student learning”, Results show that student perspectives were significant. Assessment was a powerful factor. Students import a range of experiences, motivations and perspectives which influence their response.

Research conducted by Barrett et. al (2009), on “The hidden curriculum of a Teacher Education Program-Ontario Teacher.” This study involved interviews with 47 teacher educators from eight faculties of

education. Results revealed that the new probationary teachers were competent in their teaching than the regular teachers.

Mediba, et. al. (2009), conducted a research on “Hidden curriculum on gaining the value of respect for human dignity.” A qualitative study conducted in two elementary schools at Adana in Turkey to investigate the functions of hidden curriculum in respect for human dignity, with low and high school life. The data gathered through observations and interviews from teachers and students. Observed results revealed that both schools were inappropriate features for democracy in gaining the human dignity.

At a general level students hear and understand the explicit communication about assessment offered by their lectures but they are also aware of the embodied sub-texts and have their own individual perspectives all of which come together to produce many variants on a hidden curriculum. The outcomes of assessment ‘as lived’ by students are never entirely predictable, and the quest for a ‘perfect’ system of assessment is in one sense, doomed from the outset. As further encouragement, it is important to recognize that our research has identified shifts and developments in student’s attitudes and approaches to studying in their typify Haitians of assessment. Innovative assessment has played a part in altering students’ readings of the latent messages of assessment, potentially minimizing the gap between the stated formal curriculum and the hidden curriculum. The fact that it has not done so far for all students, or for all students in the same way, is an important insight which can assist in further developments in this important aspect of the higher education curriculum. The official transition from Herbertarian to the progressive ideology, is that the ‘question-answer’ type of educational method on the rhetorical level was gradually replaced by the Dewey-inspired progressivism and ‘learning by doing’ (Dewey, 1916,

1938). In these days more emphasis is given to objectives, subjects, timetable, and syllabuses, standards and technologies and moreover results oriented. These are all important issues, but they seem to be like the tip of the iceberg, what we can see and hear and talk about: the ‘overt’ part of a curriculum. But what we do not see is just as important, it is the hidden or “covert” curriculum, and this is made up of what people-teachers, students, parents, administrators-individuals and social group should acquire awareness and knowledge, bring to it, in terms of their beliefs, attitudes, expectations, motivations. It seems that this “submerged” curriculum is largely unknown, rarely spoken about, and very often underestimated.

Major researches are only on clinics, schools, Medical students, Social studies class, and Mathematics. There were no researches related to Secondary School Education and Students. So the researcher identified this gap and taken up the present study.

2.7. Conclusion

The researcher surveyed the various researches, related to values of teaching chemistry but not the inculcation / development of hidden values of chemistry among Secondary school students. The hidden curriculum of subjects has attracted a number of researches in foreign Countries whereas a less number of Indian scholars have focused their attention on this vital aspect. The Indian studies related to the topic focused their attention mostly on the colleges and in working places. Few further strikingly reveal that no attempt was made by any researcher to find out the relationship between hidden curriculum and hidden values of chemistry teaching at Secondary School Education. This is a major research gap. In order to fill this gap the researcher has taken up the present study.

The inculcation of hidden values in chemistry curriculum among secondary school students is never incorporated in any of the above studies. So it is necessary to inculcate the subject values among secondary school students in regular teaching of the subject. In the present study an attempt has been made to enhance the hidden values of Food and Nutritive Value, Health and Hygienic Value, Medicinal Value, and Environmental Value through teaching the hidden curriculum of Chemistry among Secondary school students. Research gaps identified with respect to hidden values in chemistry curriculum, and chemistry teaching abroad and in India at school level. So the investigator selected the topic as

“An Experimental Study of imparting Values through Hidden Curriculum of Chemistry among Secondary School Students.”

CHAPTER - III

METHODOLOGY