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COVID-19 FALLOUTS AND FUNGAL DISEASE OUTBREAK – AN OUTLOOK

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Abstract

COVID-19 bio-evolutions and its associated bio-revolution is jeopardizing the entire world. Its downturn with relative sudden surge in fungal co-infection during second wave needs explicit investigation and understanding of dangerous triad intersections, COVID-19, weakened immunity and the sudden emergence of fungal co-infection as it may have devastating effect in the near future. Hence, in this review an outlook of the various prevalent fungal co-infections in COVID-19 patients, their immune diagnostic methods, potential predisposing factors and available antifungal therapeutics are explained.

Keywords: COVID-19, Fungi, Aspergillus, Mucormycosis, Candidemia, Cryptococcaemia, Penumonia

Introduction

COVID-19 and its bio-evolution is a serious global health threat. The respiratory pandemic, since its identification, have victimized about nearly 18 Crore people and caused nearly 40 lakh deaths worldwide. The twist and turns with chaos observed among the scientific community are likely

due to unknown and uneven variations in their pattern of infections, severity and mortality. The differential severity and illness in COVID-19 disease might be a consequence of several predisposing risks factors such as age, lifestyle habits or co-morbid conditions viz., chronic obstructive pulmonary disease, cardiovascular disease, diabetes and hypertension or nosocomial borne co-infections or even due to other secondary or co-occurring infections. Thus, the sudden outbreak of fungal disease and their criticality drives the attention to control the new upcoming fungal disease.

Prevalence of Fungal Co-infections in COVID-19 Patients

Amidst the various reasons for increased morbidity and mortality in COVID-19 patients, the role of fungal co-infections, their frequency and impact are scarce, particularly in patients with an acute respiratory distress syndrome (ARDS). This requires preparedness envisaged Gangneux *et al.* (2020). Even the previous historical hike in mortality rate (~ 25 – 73.7 per cent) perceived during SARS-CoV secondary infection (Li *et al.*, 2003) further alerted the physicians about sudden surge in the incidence of fungal infections in COVID-19 affected and recovered patients.

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The metric analysis by Silva *et al.*, (2020) identified that COVID-19 associated fungal infection colonizes commonly in the respiratory tract and oropharyngeal mucous membrane. The fungal co-infection observed in COVID-19 cases were predominantly *Aspergillus Sp.*, *Candida sp* and to a fewer extent even by *Cryptococcus Sp.* and *Pneumocystis jirovecii pneumonia* were also observed. Moreover, the biological evolution of SARS-CoV-2 and its subsequent bio-revolution has neglected the therapeutic research funding for the fungal tropical diseases Nargesi *et al.*, (2021).

Aspergillosis

Aspergillosis is caused by *Aspergillus* genera and the most common organism among them is *Aspergillus fumigates*. They may be of invasive pulmonary aspergillosis (IPA), chronic pulmonary aspergillosis (CAPA), allergic bronchopulmonary aspergillosis (ABPA), fungal asthma, aspergillus bronchitis or chronic rhinosinusitis states Bhatt *et al.*, (2021). COVID-19 admitted critically ill patients were found affected by Aspergillosis at different rates. About 34 per cent were found to have pulmonary aspergillosis of either invasive or putative types in France (Alanio *et al.*, 2020) and Invasive Aspergillosis in Germany. Also, CAPA is found to be highly prevalent and associated with 36 per cent mortality rate in COVID-19 patients in comparison to only 9.5 per cent in COVID patients without CAPA (Lahmer *et al.*, 2021). In yet another report from Germany (Koehler *et al.*, .2020), the

prevalence rate of pulmonary aspergillosis was about 24 per cent.

Mucormycosis

Mucormycosis, a black fungus infection was widely noticed among COVID-19 patients from India. Its occurrence as post coronavirus disease with association and its sudden surge were alerted to be a most deadly addition to the pandemic spectrum that needs immediate attention and serious consideration (Sharma *et al.*, 2020). During the second wave of COVID-19, India sees record deaths parallel to the spread of black fungus fear indicated Dyer (2021). Even the systemic review reports analyzed by Singh and his colleagues (2021), proved mucormycosis to be more prevalent among Indian COVID-19 patients with a total of about 82 cases from the global 101 cases identified with 31% mortality rate. Mucormycosis were commonly observed in nose and sinuses to about ~ 90 per cent followed by lesser occurrence to about ~ 57 per cent in rhino orbits. Yet another report from north western India also reported mortality in COVID-19 patient due to rhinocerebral mucormycosis (Nehara *et al.*, 2021).

The black fungus was also maiming the COVID patients in India states the News report (Soutik *et al.*, (2021). Out of the 40 cases identified, 20 per cent lost their eye sight in Surat city of Gujarat. This raised further panic and also triggered physicians to identify the plausible reasons for vulnerability among COVID-19 recovered patients (India Today). A rare and fatal gastrointestinal mucormycosis (Zygomycosis) has also been

reported in a COVID-19 patient from Brazil (do Monte Junior *et al.*, 2020).

Candidemia / Candidiasis

Another fungal disease that affected critically-ill COVID patients in India during April - July 2020 is *Candidemia* as per the reports of Chowdhary and his colleagues (2020). The mortality rate observed with *Candida Sp.*, (*Candida auris*) was twice more to about 60 per cent than with mucormycosis. The presence of super infections of *Candida glabrata* (Posteraro *et al.*, 2021) and *Candida parapsilosis* (Evert *et al.*, 2021) have also been confirmed as secondary fungal infections in COVID-19 patients. From a study in Italy, it was also proved that incidence rate of *Candidemia* was significantly higher in patients with COVID-19 to about 10.97 per 10,000 person-days of follow up (Mastrangelo *et al.*, 2020). The frequency of *Candidemia* in COVID-19 patients was also found to increase in Southern Brazil as per reports from two tertiary hospital to about 10 folds with steroids therapy in COVID -19 patients (Riche *et al.*, 2020).

Cryptococcaemia

Cryptococcaemia has also been identified as yet another opportunistic fungal infection in a case report of COVID -19 patient treated with immunosuppressants (Khatibe *et al.*, (2020). *Cryptococcaemia* is caused by the basidiomycete, encapsulated yeast, and *Cryptococcus neoformans*. The associated high fatality rate (37%) noticed within 30 days (Jean *et al.*, 2002) alarms physicians and clinicians about their presence

in COVID-19 patients and also recommends for the steward use of immunosuppressants while managing COVID-19.

Pneumocystis pneumonia

Pneumocystis pneumonia (PCP) is a serious infection caused by the fungus *Pneumocystis jirovecii*. A case of COVID-19 and *Pneumocystis jirovecii* co-infection has been identified by (Menon *et al.*, 2020). This co-infection is not appreciable as both of these share many overlapping clinical features and making its differentiation arduous due to which misdiagnosis of PCP as COVID-19 has also been stated in two HIV infected patients (Guo *et al.* 2020). Concurrent COVID-19 and *Pneumocystis pneumonia* has also been reported in a severely immunocompromised young patient (Bhat *et al.*, 2020)

Potential Predisposing Factors of Fungal Co-infection

The paradox of what provoked the fungal disease outbreak as whether widespread usage of long term corticosteroids during SARS CoV-2 management or its previous use due to various other concomitant dermatological diseases (Kutlu & Metin, 2020) remains unclear. Many complex reasons have been put forward for the surge in fungal co-infections. Immunosuppression caused due to overuse of therapeutics, steroids could have increased the fungal co-infections among COVID-19 patients. It might have perpetrated the immunity burden while weathering cytokine storm during COVID-19 management. Thus, resulting immune suppression or the deficiency noticed in critically ill COVID-19 patients

with higher levels of pro-inflammatory cytokines (IL-1, IL-2, IL-6, tumor necrosis alpha) and anti-inflammatory (IL-4, IL-10) cytokine levels and lesser CD4 interferon-gamma expression, and fewer CD4 and CD8 cells might have increased the risk of serious fungal infections, such as *invasive pulmonary aspergillosis*, *invasive candidiasis* or or *Pneumocystis jirovecii pneumonia* states Pemán *et al.*, (2020).

A significant surge in the incidence of angioinvasive maxillofacial fungal infections especially among diabetics treated for SARS-CoV-2 with corticosteroids might be due to its unholy trinity combination argues Moorthy *et al.* (2021). Thus, clinical manifestations of immune suppression observed in any form viz., increased biological ageing or its risky epigenetic regulators such as environmental and lifestyle factors with co-morbidities (Mueller *et al.*, 2020) could also have possibly promoted the epidemic outbreak of opportunistic fungal infections in different countries which in future, might become yet another pandemic parallel to COVID-19 waves.

Experts (Vishal *et al.* 2020) argue that mucormycosis / fungal co-infections could have possibly surged due to the hypoxic conditions, a prevalent risk factor in COVID-19 patients. Hypoxia could have possibly influenced the virulence of the commensal fungi such as *Aspergillus*, *Candida* and *Mucor* to become human pathogenic fungi. Studies have also proven that a shift to hypoxic environment disturbs metabolic homeostasis and a consequence

of shift in energy synthesis pathway from carbohydrates to fatty acids such as ergosterol Chung *et al.*, (2020) with corresponding up-regulation of virulence pathogenic pathway leading to severe tissue damage, necrosis and immune cell dysfunction in the host (Soliman *et al.*, 2021).

It also remains unclear as whether fungal infections occur before or post COVID-19 disease or as contracted nosocomial infections. Pathogenically it was proven from studies (Moser *et al.*, (2021) that COVID-19 by itself could have impaired immune response and increased the susceptibility to *Candida albicans* / Invasive Fungal Yeast Infection by attenuating monocyte CD-80 up-regulation and abrogating the release of IL-6, TNF, IL-1 α , and IL-1 β . Otherwise, even the clinical factors such as prolonged ICU stays, central venous catheters, and broad-spectrum antibiotic use, also could have been certain other possible key factors for the development of secondary co-infections such as Invasive Fungal Infections/ *Candidemia* in COVID-19 patients insinuates Arastehfar *et al.*, (2020). Thus, the notable incidence of *Candida Spp.*, in COVID-19 patients also raise its probability of being a superinfection that was caused due to *aspergillosis*, a invasive fungal infection in COVID-19 or potential drug toxicity argues Heard and his colleagues (2020).

SARS CoV-2 viral interactions with various other inter-kingdoms also warn the scientific community of scary bio-evolution of many new emerging variants and diseases. The possibility of SARS CoV-2 variants with enhanced mycoviral

properties also needs further investigation to understand their interaction mechanisms and their biological impact, comments Mendes *et al.*, (2020). Moreover, the confirmed presence of double stranded RNA elements in *Mucorales Sp* in various studies (Vágvölgyi *et al.*, 1993 & 1998; Papp *et al.*, 2020) also invoked further clinical interest to understand how the mycoviruses become hyper or hypo virulent killer phenotypes (Soare *et al.*, 2020). Probably, similar type of interactions could have occurred between SARS CoV-2 viral variants and *Mucorales Sp.*, may have augmented the mucormycosis in COVID-19 affected or recovered patients.

Neglecting antimicrobial stewardship principles during COVID-19 management would increase antimicrobial resistance and potentially exacerbate in future to other disease affirms Huttner *et al.*, (2020). Silvia and his colleagues (2020) also confirmed about lack of optimal fungal treatments in COVID-19 positive patients as high-risk robust surveillance strategies in clinical settings are required to treat and reduce fungal infections. However, a probable clinical flow suggestion, outlined by Song *et al.*, (2020), helps clinicians and laboratory experts worldwide in the effective management of fungal co-morbidities in severely ill or immune-compromised COVID-19 patients helps clinicians and laboratory experts worldwide.

It's essential to understand the role of bacterial and fungal infections in COVID-19 asserts Rawson *et al.*, (2021), to remove the clinical uncertainty associated with the prescription of antimicrobials to COVID-19

patients both on and during hospital admissions and their related antimicrobial resistance to tackle super microbial infections. The alterations in the fecal fungal microbiome such as *A. flavus* and *A. niger* of patients with their presence even after clearance of SARS CoV-2 from nasopharyngeal samples and resolution of respiratory symptom requires further studies to determine the role of intestinal fungal contribution to or that results from SARS CoV-2 infection and the subsequent in disease progression states Zuo *et al.*, (2020).

Current Antifungal Therapies in COVID-19 Patients

Intubated COVID-19 associated CAPA patients treated with antifungal agent, voriconazole showed a lower trend in mortality and reduction in galactomannan index as per the prospective study reports (Bartoletti *et al.*, 2020). Similar therapeutic effects to voricanazole were also noted in critically ill COVID-19 IPA patients with extracorporeal membrane oxygenation support (Helleberg *et al.*, 2021).

Rhinocerebral mucormycosis diabetic ketoacidosis COVID-19 pneumonia patient treated with corresponding medications viz., intravenous abelcet / amphotericin B, insulin and cefepime along with three surgical debridements was discharged successfully re-emphasizing that the control of blood glucose levels followed by reversal of ketoacidosis may have improved the disease condition of mucormycosis as per the suggestions of Brunet & Rammaert (2020).

The opportunistic fungal co-infection, oral *candidiasis* in COVID-19 patients after 24 days of ICU admission were treated with systemic fluconazole and oral nystatin (Dos Santos *et al.*, 2020). In another report from Iran, the oropharyngeal *candidiasis* in hospitalized patients was treated with fluconazole, nystatin and caspofungin (Salehi *et al.*, 2020). COVID-19 associated IPA patients were also preemptively treated with empirical regimen of amphotericin B and voriconazole as antifungal therapy to oversee the fungal co-infections (van-Biesen *et al.*, (2020).

Review report by Arastehfar *et al.*, (2020) purports that new antifungals with promising pharmacokinetic and pharmacodynamic profiles are essential to overcome the complications related to CAPA treatment using broad spectrum azoles in

SARS CoV2 affected multi-organ failure renal tropism patient in them may cause azole drug resistance and drug – drug interactions.

Conclusion

The sudden upward trend in fungal infections during second wave of the novel coronavirus demands new rapid technological confirmatory immunodiagnostic innovations and also calls for new antifungals and judicious use of steroids, immunosuppressant's and broad spectrum to avoid multi drug resistance and drug - drug interactions in COVID-19 infections. Also, the interactions of SARS-CoV-2 with the other inter-kingdoms such as *fungi*, *bacteria* and *viriae* needs to be elucidated to identify their causal relationships and also to know how far these interactions could impact the severity and outcome of any other co-infectious disease in COVID-19 patients.

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GROWTH AND ACHIEVEMENT OF WOMEN ENTREPRENEURSHIP IN INDIA

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Abstract

Women are called back bone of the society. Women lead a family. Foundation of each family or society is defined by the status of the women. Community and economic progress of women is necessary for the growth of any nation. A great personality says that “No war can be fought without the help of the better half of the society whether it is economic growth, cultural growth, educational growth or social growth. Despite all the hurdles and stops, Indian women manage to raise the social status not much but a start is better than nothing. Women entrepreneurs organize all the factors of production. They are facing many difficulties and provide job opportunities to various people. Thus, women entrepreneurs are capable to contribute values to both society and their family. There are so many issues related to women entrepreneurs. But their problems are different from male owned businesses. After the widespread of education and social awareness during the last three decades, now women are showing interest in starting their own venture. Hence, there is a considerable growth of women entrepreneurs in India.

Keywords: Women, entrepreneurs, economic growth, state, India, empowerment

Introduction

The growing role of women has been a key element of economic growth over the last decades. Enhanced recruitment strategies promote talented women in leadership and management positions. (Colaco and Hans, 2018). In India, female households in rural areas accounted for 11.5 per cent, compared to 12.4 per cent in urban areas for the 68th round of the 2011-2012 National Sample Survey. The female literacy rate was 65.46 per cent per population survey in 2011. Moreover, the labour force participation rate for females was 25.51 per cent as per the 2011 population survey. Females have begun to play important roles in the decision making process. (All India Sixth Economic - Department of Statistics, Census 2013-2014). Despite tremendous growth achievements, women entrepreneurs are still facing many challenges. This paper focuses on the growth and achievement of women entrepreneurs in India. becoming successful entrepreneurs in India. (Starcher 1996).

Access to finance is one of the greatest obstacles that entrepreneurs of any gender face. In the case of Women, this is an additional burden to many other difficulties

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they face. Primarily their community duties of females often discourage women from becoming successful entrepreneurs in India. (Starcher, 1996). The estimation of the Indian women entrepreneurship reports shows that about one thousand one hundred and forty-five women start-up enterprises were hindered mainly due to lack of personal identity and lack of property in her name. Banks are reluctant to lend financial capital to women entrepreneurs, particularly if they have no male or family support states Rama. (2016). Gender inequality and the patriarchal systems that are India from is another challenge women have to cross across to become entrepreneurs. Even the gender development index shows the existing gender gap in economic growth.

In defiance of all these women have different reasons for becoming an entrepreneur states Goyal and Prakash, (2011). Most of the successful women entrepreneurs are associated with pickles, papad and flour making. In the early stages, women started to build their businesses in the cookery field. However, with the passage of time, technological interventions increased productivity and empowered them. Women entrepreneurs are an important untapped origin of talents for our country's economic growth states Narshima-Moorthy, (2009), as it generates different jobs for themselves and for others. Singh (1992) in his study confirmed that beyond the challenges women entrepreneurs are returning to the

professional front is a reflection of specific policies and programs laid to promote women entrepreneurs. He further emphasized the analysis of women entrepreneur profiles and identification of traits and motivational forces would help to improve their performance and as a reference for other women entrepreneurs. Women's empowerment and development could be achieved with equality attainment through women's constitutional rights in the society (Iyer, 1991).

With this backdrop, the study was conducted to review the growth and achievement of women entrepreneurship in India and to give suggestions for the better performances of women entrepreneurship in India.

Methodology

The study data was gathered from secondary sources viz., Sixth Economic Census, Ministry of Statistics and Program Implementation Government of India. The study covers the period of 2013 to 2018. The statistical tools used for the study are percentage analysis and rank cases.

Results and Discussion

Top ten states in establishment under women entrepreneurship is depicted in Table 1 and Fig 1. According to Table 1, ten states in terms of percentage share in total number of women entrepreneurs are in Tamil Nadu (13.51%), in Kerala (11.35%),

in Andhra Pradesh (10.56%), in West Bengal (10.33%), in Maharashtra (8.25%), in Karnataka (6.78%), in Gujarat (6.57%), in Uttar Pradesh (5.99%), in Telangana (4.43%) and in Odisha (3.10%). The Table 1,

indicated that the Government of Tamil Nadu, Kerala and Andhra Pradesh are supporting, encouraging the women entrepreneurs and created a conducive environment for women entrepreneur.

Table 1. Top ten States in Establishments under Women Entrepreneurship

States / Union territory	Women establishments	Percentage share of total establishments	Rank
Tamil Nadu	1087609	13.51	1
Kerala	913917	11.35	2
Andhra Pradesh	849912	10.56	3
West Bengal	831337	10.33	4
Maharashtra	664300	8.25	5
Karnataka	545806	6.78	6
Gujarat	528623	6.57	7
Uttar Pradesh	482379	5.99	8
Telangana	356486	4.43	9
Odisha	249600	3.10	10

Source: 6th Economic census, Ministry of Statistics & Programme Implementation, GOI

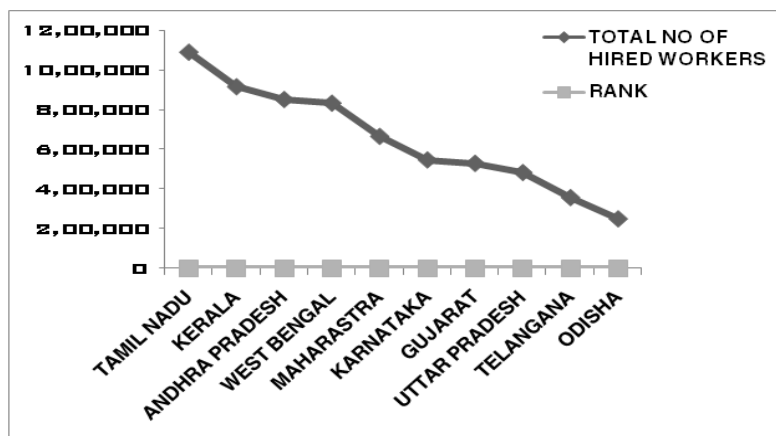


Fig 1. Top Ten States in Women Establishments

Source: Computed data

Table 2. Total Number of Persons employed in Women Owned Enterprises

State / UT	Total no of persons employed (in lakhs)	Rank
Jammu & Kashmir	69,067	22
Himachal Pradesh	70,523	21
Punjab	216,537	15
Chandigarh	10,361	31
Uttarakhand	66,003	23
Haryana	208,355	16
Delhi	159,421	17
Rajasthan	439,335	11
Uttar Pradesh	929,105	7
Bihar	282,522	13
Sikkim	9,066	32
Arunachal Pradesh	14,079	30
Nagaland	27,523	26
Manipur	110,822	20
Mizoram	26,327	27
Tirupura	19,880	29
Meghalaya	58,701	24
Assam	253,072	14
West Bengal	1,372,730	2
Jharkhand	118,413	19
Odisha	445,703	10
Chhattisgarh	147,597	18
Madhya Pradesh	398,565	12
Gujarat	1,001,256	6
Daman & Diu	1,923	35
D&N Haveli	4,419	34
Maharashtra	1,097,876	5
Karnataka	919,039	8
Goa	28,739	25
Lakshadweep	949	36
Kerala	1,147,025	4
Tamil Nadu	1,856,686	1
Puducherry	20,027	28
A & N island	4,981	33
Telangana	586,546	9
Andhra Pradesh	1,325,009	3
ALL INDIA	13,448,182	

Source: 6th Economic census (2013-2014), Ministry of Statistics & Programme Implementation, GOI

Table 2 and Fig.2 depicts the total number of persons employed in women owned enterprises. According to Table 2, the higher number of the top five states in which persons employed in women owned enterprises are Tamil Nadu (18,56,686), West Bengal (13,72,730), Andhra Pradesh (13,25,009), Kerala (11,47,025) and Maharashtra (10,97,876). The Government of Tamil Nadu encourages many women and provides many tax benefits to become entrepreneurs.

Fig.3 depicts that woman entrepreneurs are largely perennial, indicating that women are interested to invest in long term businesses. Majority of women entrepreneur were involved in long term businesses and that can create further expansion.

Table 3 depicts that almost 79% of the women entrepreneurs starting their businesses with their own capital. The second important source of finance was donations (14.65%) from various non- governmental agencies. 3.3% women entrepreneurs were getting their financial assistance from government sources.

Suggestions to Women Entrepreneurship in India

- ✓ More number of awareness programs can be conducted in women educational institutions with the help of real women entrepreneurs. So, women will be motivated to take up entrepreneurship.
- ✓ Goods and Services Tax can be exempted. So, that the sales as well as profit can be increased in women owned enterprises.

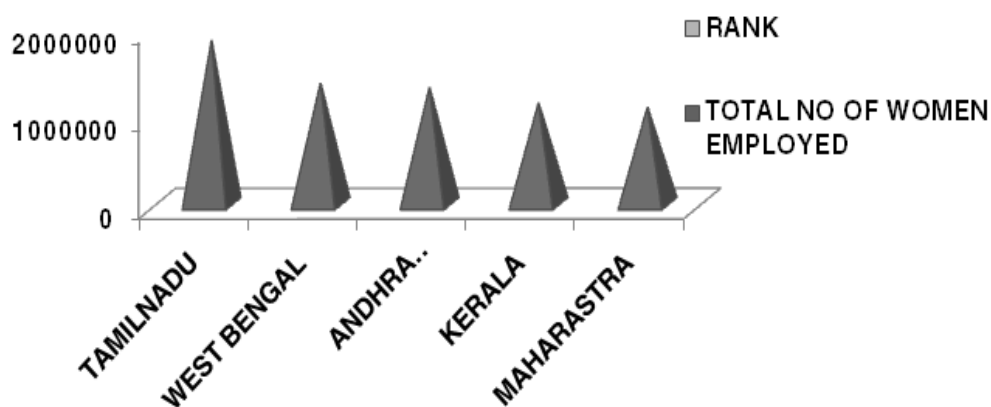


Fig 2. Persons employed in Women owned Enterprises in Top 5 States

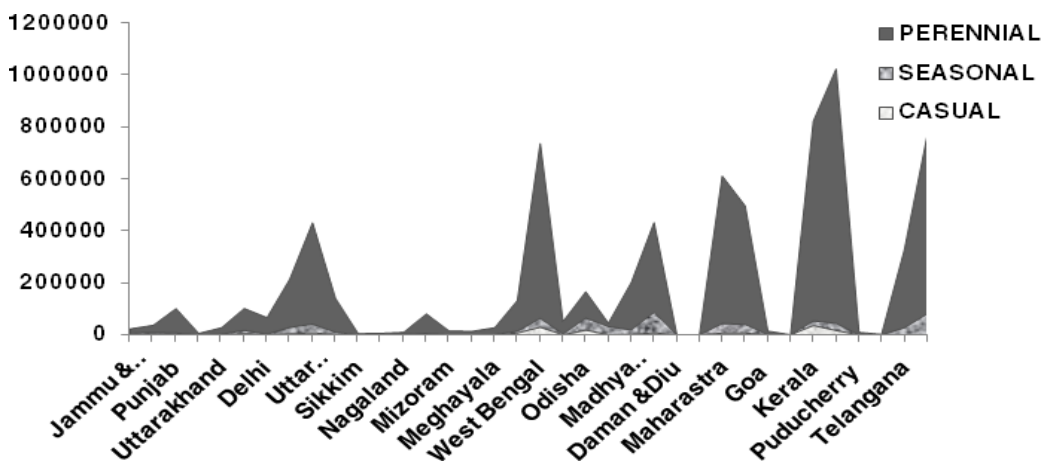


Fig 3. Nature of Establishment by Women Entrepreneurs

Source:-6th Economic census (2013-2014), Ministry of Statistics & Programme Implementation, GOI

Table 3. Source of finance of Women Entrepreneurs - All India Level

Source of Finance	Amount arranges (in Rs.)	Percentage	Rank
Self finance	63,65,447	79.1	1
Financial assistance from government sources	2,70,978	3.3	3
Borrowings from financial institutions	86,789	1.1	4
Borrowings from non- financial institutions / money lenders	67,525	0.8	6
Loan from SHG's	80,660	1	4
Donations transfer from other agencies	11,79,420	14.7	2

Source: 6th Economic Census Department of Statistics

v Skill based training to be provided to women entrepreneurs. So, that they can take technology oriented business.

Summary and Conclusion

Employment improves the economic status and provides avenues to their social status thereby, empowering women. Women entrepreneurship is a key to promote a dynamic economy and economic growth. The current study suggested that women entrepreneurs' status could be improved and

enhanced through the provision of appropriate training, opportunities and inspirations, opportunity for social recognition of their entrepreneurship abilities and family moral support. Remarkable growth and achievement of women entrepreneurship in Tamil Nadu accompanied by the other South Indian States Kerala, Andhra Pradesh provides a recommendation for every other state to concentrate and focus more on the female upliftment through entrepreneurship.

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ASSESSING THE POSSIBILITIES OF RECOVERING RESOURCE FROM VEGETABLE AND FLOWER WASTE

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Abstract

Waste can be liquid, solid and gaseous, and each type has various techniques for disposal. The Central Pollution Control Board postulate Urban India produces about 50 million tons of Municipal Solid Waste (MSW) consistently. One among the South Indian District, Coimbatore generates about 900 tons, of which half per cent is compostable and 15.52 per cent is recyclable bio-waste. The flowers and vegetable waste constitutes a large amount of biodegradable organic wastes. Its biomass feedstock waste generation increases from 1000 and 1200 tons, especially during festivals and holidays. It's recycling through the composting process to generate energy resources of manure, soil amendment to manage and avoid ill-effects to the environment and human beings is a better waste management practice. Hence, the current study was planned to utilize waste effectively for the benefit of the society and environment. Furthermore, this study enlighten the aspects such as the quantum of flower and vegetable waste generation at source points of markets, the feasibility of recovering wealth from the waste and creating awareness among the public on waste management practices.

Keywords: Flower and vegetable waste, compost, waste segregation, NPK content, manurial value

Introduction

Waste disposal is a significant concern in the world. Diversity in the content of waste creates problems in its reduction. Safe disposal of floral and vegetable organic waste has been a cause of respect for waste management (Elango & Govindaswamy, 2018). India is experiencing rapid urbanization and an uncontrolled growth rate, leading to acute problems in waste management. Future estimation depicts that by 2031, urban areas would generate 165 million tons of waste annually, and by 2050 it would reach 436 million tons. Accommodation of garbage produced will require about 43,000 hectares of land (Joshi *et al.*, 2016). The waste generated can be classified into organic (all kinds of biodegradable), dry (or recyclable waste), and biomedical (or sanitary and hazardous waste). Mixed biodegradable and inert waste is often dumped or burned in open spaces.

The composition of waste in India is entirely different when compared to western

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countries. Improvements to waste collection and transport infrastructure in India will create jobs; improve public health and sanitation (Kumar *et al.*, 2017). The large quantities of fruit and vegetable waste accumulating in markets are a source of environmental nuisance in municipal landfills because of their high biodegradability (Arvanitoyannis and Varzakas, 2008). The volume occupied by these wastes due to dumping and burning could be reduced enormously by conversion to value-added organic manure, through an inexpensive composting strategy.

Thus the current study objectives were a collection of general information about waste collection and segregation from a selective survey of two active resources, the raw material seller (vegetable and flower) and waste segregator in dump yards at chosen source points for efficient waste management in the Coimbatore City. Another objective was to prove usage of natural boosters during composting process enhances biodegradation and produces NPK rich soil amendment manures, an efficient eco-sustainable strategy to form a green city.

Methodology

Purposive sampling method was used to collect general information about the waste accumulation source and disposal areas respectively from (flower markets & vegetable market / dump yards) study respondents flower / vegetable sellers and corporation workers in waste management process.

Composting Process

A suitable polyethylene container was selected for composting process and it was allowed to stay in open space for direct sunlight. The composting constituents include two different compost sampling compositions. Sample I consisted of 5 kg of vegetable waste, 1 liter of water and 2½ kg of soil (booster) and Sample II consisted of the same constituents except for the change in bio-waste as flower waste. The solid composting constituents of both the samples were placed as alternate layers separately in the ratio of 500g: 100g at an equi-distant in two different composting containers for the biodegradation process to occur. Ten such alternate layers were packed inside each of the containers and placed in direct sun light for open aeration. For adequate moisture, water was sprinkled frequently and also the composting mixture was mixed thoroughly and turned frequently for 3- 4 days to provide additional aeration during the composting process. Two different time line for complete composting period was standardized as 60 and 52 days for both the respective samples.

Table 1. Composting Strategies

Compost	Constituents
I	Vegetable Waste + Water + Soil
II	Flower Waste + Water + Soil

Evaluation of Nitrogen Phosphorus and Potassium (NPK) content / Manurial Value of the Organic Waste Composted Sample

After the composting process, the two samples were evaluated for its available Nitrogen (Subbaiah and Asija, 1956),

Phosphorous (Olsen *et al.*, 1954) and potassium (Stanford and English, 1949) by outsourcing the compost sample for analysis at a NABL accredited laboratory in Coimbatore.

Results and Discussion

The findings of the study are presented below :

Waste Accumulation Source Point (Market) and Vendors Survey

Table 1 depicts that 62 per cent owned their shops, and 38 per cent rented the shops in the market for vending vegetables and flowers. Women seemed to engage in vegetable and flower vending jobs proportionately equal to men. Majorities (35%) of the shopkeepers had passed high school and thirty three per cent of them were illiterates. Their monthly income ranges from Rs.4000 - Rs.15000 per month. Although the educational status of female vendors is poor than males, hardworking never ends with them, and their monthly income varies from person to person. Most of the study respondents were in the age group of 50 – 60 years. It clearly shows that age is not a matter for work and generating income. Majority of them were in nuclear families. Every person in a joint family acted as a supporting pillar in running a family and keeping a family united.

Knowledge on Waste Disposal among Study Respondents

Waste disposal and management is essential to keep the environment clean and protect the humans from ill health.

Table 1. Details about Market Survey

Information collected from Market survey	Vegetable & flower market (%)
Nature of the shop	
Own	62
Rented	38
Gender	
Male	54
Female	46
Educational Status	
Up to 10 level	35
Up to 12 level	23
Under graduate level	9
Illiterate	33
Monthly Income(in Rs.)	
Low (4001 – 7500)	24
Middle (7501 – 10000)	28
High (10001 – 15000)	26
Above 15000	22
Types of Family	
Nuclear Family	77
Joint Family	23

Waste management includes maintaining and regulating the collection of wastes, transportation, treatment and waste management process.

From the table 2, it was clearly understood that the waste generated in all the markets was regularly collected and disposed off at the dump yards through corporation workers. Thirty five percent of shopkeepers expressed that the they disposed waste twice in a week, thirty per cent of them disposed the waste once every two days. The quantity

Table 2. Knowledge on Waste Disposal among Study Respondents

Waste Collection & Disposal	Percentage
Regular Collection	
Yes	100
No	-
Frequency of disposal of market Waste	
Every day	28
Once every two day	30
Weekly Twice	35
Weekly once	7
Quantity of waste produced per day	
Above 5 kg	22
Small amount (10-20 kg)	32
Medium amount (20-50 kg)	30
Large amount (50-60 kg)	16
Methods of disposal waste	
Polythene / Plastic bucket	43
Small bucket	32
Any other Container	25
Place of Disposal of Market Waste	
In the dustbin	40
By the side of the road	15
In an open empty space near the shop	24
Others	21

of waste produced per day ranges from 5 kg to 60 kg in vegetable and flower markets. Majority of shopkeepers used polythene / plastic bucket for their waste disposal.

From the survey, it was found that the study respondents disposed waste at their convenience. Only 40 percent of study respondents had knowledge to dispose waste in a garbage bin, twenty four per cent of them disposed waste in the empty spaces near their shops, fifteen percent people disposed the waste on the roadside without considering the effects of fly breeding and

other environmental issues, and the remaining 22 percent disposed in other places.

Table 3. Awareness regarding the Need for Education about the Waste Management

Education on waste management	Percentage
Camping and public education programs lead to successful waste management	
Agree	88
Disagree	2
Neutral	10
Waste collection by staff and educating people will attract their support for an effective waste management	
Agree	59
Disagree	13
Neutral	28
Waste management education and campaigning is an effective tool to manage waste.	
Agree	45
Disagree	28
Neutral	27
Creating awareness to the public through multimedia will reduce waste generation	
Agree	66
Disagree	18
Neutral	16

The study respondents agreed that various modes of education programs on waste management improved their perception to effectively manage waste (Table 3). Majority of them agreed that camping and public education programs lead to successful waste management. Only 59 percent of them agreed to the statement, that waste collection by staff and educating people will attract their support for effective waste management. The remaining 28 percent did not have any idea in this regard.

Forty five per cent of them agreed that waste management education and campaigning is an effective tool to manage waste whereas creation of awareness on waste management and reduction through multimedia reduce waste generation was agreed by 66 per cent of the study respondents.

Table 4. Attitude towards Environmental Impact of Improper Waste Disposal

Environmental Impact	Percentage
Burial of waste pollute water	
Agree	93
Disagree	2
Neutral	5
Incineration of waste causes air pollution	
Agree	56
Disagree	6
Neutral	38
Improper waste management may lead to water and air pollution	
Agree	59
Disagree	21
Neutral	20
Landfill sites and treatment plants adjacent to water bodies and marshy areas pollute water	
Agree	68
Disagree	17
Neutral	15
Improper waste management leads to depletion of certain species from the earth	
Agree	74
Disagree	9
Neutral	17
Odour around waste dumps is due to methane gas generated from the decomposition of biodegradable waste	
Agree	72
Disagree	7
Neutral	21

Awareness related to environmental protection will make people understand the importance of providing a safe environment. According to the survey, 93 percent of study respondents agreed that burial of waste pollutes the groundwater (Table 4). 56 percent accepted that burning of waste pollutes the air. A minimum of six percent denied that the earth is not affected by burning wastes and 38 percent were clueless about the contaminated air. Fifty-nine per cent of the public were aware that improper waste management would lead to water and air pollution. Many shopkeepers were not aware of the proper process of waste management and also not aware of its consequences. They were pretty cooperative and ready to learn. They assured that they would follow the procedures in the future as they understood the benefits of proper waste disposal.

Table 5: Awareness of Health Problems

Health issues	Percentage
Clogging of drain leads to unsanitary conditions	
Agree	99
Disagree	-
Neutral	1
Improper waste disposal may lead to vector-borne diseases	
Agree	95
Disagree	-
Neutral	5
Lead to rodents, animals and birds scavenging	
Agree	44
Disagree	41
Neutral	15
Causes respiratory problems, eye infection and water-borne diseases	
Agree	65
Disagree	14
Neutral	21

Health is more important than wealth. Awareness of disease and symptoms is essential for screening and early detection. Majority (99 per cent) of people expressed that throwing waste leads to health hazards (Table 5) such as chikungunya, dengue, malaria, etc. On average, 44 per cent of people agreed that animal droppings were the primary cause for many diseases. About 65 per cent of people decided that human beings are affected by the conditions like respiratory problems, eye diseases through the waste dumps. About 14 percent disagreed the statement that the improper disposal of waste may cause respiratory issues, and the remaining 15 per cent were neutral about eye diseases.

Waste Disposal Points (Dump Yards) and Waste Segregators Survey

The survey from the study respondents showed waste collection varies widely with no waste collection on certain days. It might be due to a large amount of waste collection during functions and ceremonies or no sales in vegetable and flower markets. The supervisor mentioned that most of the corporation waste segregating workers were from below the poverty line. Waste segregation by the workers is of two categories of biodegradable and non-biodegradable. The workers were paid wages of Rs.2 per kg for segregating biodegradable waste. In few cases, they are not at all paid for segregating non-biodegradable waste. Also, the corporation workers reported no observable allergies that arise due to their nature of work. Waste collection around the area, the city corporation used several modes of road transport like lorry and tempo etc.,

the traveling allowances for collecting waste cost around Rs.500-1000 per day. All the workers felt that waste segregation is quite complicated work. The majority of them works a maximum of 3 to 4 hours to segregate the wastes.

Details of Waste Disposal Collected from Vellalore Panchayat

From the survey it was found that for each and every day, the collection of waste differs, and sometimes, there will be no collection of waste. It was due to that large amount of waste was collected during functions and ceremonies conducted and also due to no sales in vegetable and flower markets. The supervisor mentioned that the workers working in the corporation were from below poverty line. It was informed that the wastes were segregated into two different categories, namely bio degradable and non- bio degradable. For segregating bio degradable waste the workers were paid with wages of Rs.2 per kg and sometimes for segregating non-bio degradable waste, the workers were not paid with Wages.

All the corporation workers mentioned that they had no allergies while working in the corporation. For collecting the waste around the area the corporation used several modes of road transport like lorry, and tempo etc., the traveling allowances for collecting waste cost around Rs.500-1000 per day. All the workers felt that segregation of waste was quite complicated because few waste can be segregated easily and remaining waste like non recyclable waste can't be segregated. Majority of them works maximum of 3 to 4 hours.

Details of Waste Disposal Collected from Kurudampalayam Panchayat

The supervisor of Kurudampalayam mentioned that they collect waste only from kurudampalayam village. It was believed that the waste was collected every day. The waste collected weighs approximately one to two tons. All the workers mentioned that they had no allergy while working in the waste corporation. They use battery bikes to collect the waste. In order to charge the bike for collecting waste they collect rupees one from each house.

The waste was segregated into bio degradable and non-biodegradable and the bio degradable and non-bio degradable were recycled. Using bio degradable waste they prepare vermicompost to make manure for plants. They send the plastic bottles to the synthetic thread industry. The chocolate wrappers were sent to road contractor to lay strong road. The monthly wages paid for the workers range from Rs. 2000 to 3000 per month. The workers felt easy in segregating the waste, because when they

collect waste from each house the households themselves segregate the waste into two categories. It is believed, that the workers work for 4 to 5 hours in day.

Manurial Value of the Prepared Organic Waste Compost

From table 6, it was understood that compost prepared with flower waste as base organic source produced compost of high manurial value rather than the compost prepared with vegetable waste as the base source. The primary macronutrients Nitrogen Phosphorus and Potassium are mineralized more from the flower waste and soil booster composition rather than from vegetable waste and soil composition. The enhanced biological nutrient mineralization observed in both the compost might be attributed to the addition of microbiome rich soil during the composting process (Palaniveloo *et al.*, 2020). Nevertheless, both of these organic wastes could be efficiently utilized through waste recycling management process and used as natural soil amendment for a sustainable environment.

Table 6. NPK Content in per 100 gm of Sample

Sample	Nitrogen* N %	Phosphorus* P %	Potassium* K %
I (Vegetable waste + Soil + water)	0.45	0.06	1.8
II (Flower waste + Soil + water)	0.52	0.075	0.025

*Result from reputed lab

Conclusion

Vegetable and flower waste disposal is a global problem. Agricultural residues, marketplace waste, temple waste, domestic

waste and oil cakes are rich in carbon content. Land-filling remediation methods do organic waste disposal. Disposal of vegetable and flower waste is one of the nuisances caused

to the environment. If the vegetable and floral wastes could be converted into compost and other fertilizers and used to raise crops, this can hasten plant growth and produce food rich in essential nutrients. The wastes can thus be converted to wealth. This process could solve the disposal of vegetable and flower waste and besides water and environmental pollution will also be reduced. Proper disposal of waste can protect humans

and animals from harmful effects caused due to toxic gases and diseases. Recycling and reuse of waste can avoid disposal of waste, minimize landfills; as a result, energy can be saved. The change should start from people in the household level by segregating waste into biodegradable and non-biodegradable. This change will help to develop a clean city and then the nation at large.

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APPRAISING SCHOOL READINESS SKILLS AMONG CHILDREN WITH HEARING IMPAIRMENT

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ABSTRACT

The first five to six years of a child's life is a critical time duration during which most of the basic foundation of education, lifelong learning and development is built off. The occurrence of hearing impairment among children during their developmental stage is challenging even for experienced health workers to identify and it adversely affects the child's personality as a whole. It affects their social and educational ties because of communication lack with the world around him or them. Hence, special children are measured using their school readiness level to succeed academically, cognitively, socially and emotionally. The present study was conducted to assess school readiness levels among the hearing impaired children in the age group of 2-9 years. Six dimensions of school readiness were analyzed based on the parameter of age-equivalent performance matched with the age of entry of formal schooling (for the first five dimensions) and average performance level (for the sixth dimension). The interpretation showed that cochlear implanted children had enhanced learning to communicate and socialize. Even

though children using cochlear implant can acquire language and communication skills, appropriate training and follow-up is required to support and enhance learning.

Keywords: Children, Hearing Impairment, Cochlear Implant, School readiness, dimensions

Introduction

Health is a central state of life for existence, being free from illness or injury. "*Health is defined by WHO (2006), as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*". In a child's development, the earliest years of life, up to the first five to six years are the most critical developmental period for providing a strong basement of health, basic education, lifelong learning and development.

Hearing is one among the five senses, and allows one to perceive sound. When the ability to perceive sound is lost either totally or partially, it is termed as hearing impairment, hearing loss, or hard of hearing. Hearing impairment is a hidden and a

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most challenging personal problem for the individual who have lost the hearing potential. Dealing with such special children at an early life stage is a challenge and it impacts their social and educational development. Hearing aids and Cochlear implants are the only option to confront such children with hearing disability to intervene and improve their early life stage development and school readiness levels

Various perceptions of school readiness levels during early child's development are available in reports. Peterson, (2018) states that preparation for school readinesses are initiated during child's birth and continues until they reach Grade 1. The concept of school readiness is usually associated with the pre-primary and primary grades. Nonetheless, it applies to learning throughout the school years. Research studies have demonstrated that the most positive perceptions of classroom structure and overall school environment by children in Grade 1 are connected to greater academic engagement, a mediator of preventing dropout (Valeski & Stipek, 2001).

While many people think of academics (e.g. writing their name, numerical counting upto Number 10, identifying colors) as the crucial school readiness skills, school readiness is much beyond with inclusion of more broad range of skills. A school readiness skill includes multitude of characteristics such as self-care, attention, concentration, physical skills, emotional regulation, language skills

and play and social skills according to Kumar (2015).

Maryland Model of School Readiness (MMSR, USA) defines school readiness as "the state of early development that enables an individual child to engage in and benefit from early learning experiences. School readiness acknowledges individual approaches towards learning as well as the unique experiences and backgrounds of each child". School readiness is a measure of how prepared a child is to succeed in school, cognitively, socially and emotionally. High-quality early childhood education and pre-school education programs can best promote school readiness by helping to secure the social and emotional foundation upon which children can build cognitive skills that promote knowledge acquisition in academic domains such as reading, writing and math.

Thus, the present studies aimed at the assessment of the school readiness of hearing impaired special children in relation to their skill acquisition and compare their learning outcomes using cochlear implant and hearing aids.

The formulated hypothesis of the study are explained in terms of H01 and H02 where H01 indicates the presence of no significant difference between dimensions of school readiness among selected sample in relation to assistive device used and H02 indicated the presence of no significant difference between dimensions of school readiness among

selected sample in relation to age group. The study findings might strengthen the hands of general and special educators, parents of children with hearing impairment regarding the basic abilities and school readiness in young children for catering unique needs of each and every child which is essential for the strong foundation of basic education, lifelong learning and future development in each and every child.

Methodology

Two Hearing impaired centres were identified from Coimbatore District to conduct the study after obtaining appropriate permission and approval. Study population of 30 respondents was chosen by purposive sampling technique. It consisted of hearing impairment children studying in the age range of 2-9 years. 17 boys and 13 girls were among the study population.

An Interview schedule consisting of 20 questions was used to elicit information on background profile of special children with hearing impairment. Keeping in mind various dimensions of school readiness, School Readiness Test for Children with Hearing Impairment (SRT-CWHI) was adapted as the test tool developed by Kumar (2015). For meaningful interpretation of scores, norms of the test were essential. In the present study, norms for the dimensions of school readiness were taken from standardized tool-manual (SRT-CWHI, 2015). About 40 minutes was taken to assess the school readiness skills

of each respondent. Assessment enabled the investigator to score the individual sample on the basis of their performance in the given activity provided the instructions (through Verbal / Sign / Prompting mode as appropriate).

Results and Discussion

School Readiness results represented in Table 1 revealed the school readiness status of the hearing impaired children with either supportive hearing aids or surgical cochlear Implanted (electronic device). It is clear that the readiness with reference to dimensions namely Perceptual Abilities (PA), Arithmetic Reasoning Skills (ARS), Memory Skills (MS) and Eye Hand Coordination Skills (EHCS) were found to be above 50 percent, while with reference to communication skills (CS) the entire samples with hearing impairment were found to lack receptive and expressive language skill ability that are necessary for school readiness and learning during early

Table 1. Status of Readiness of the Selected Sample with Reference to Different Dimensions of School Readiness

Dimensions of School Readiness	Status of Readiness	
	Not Ready (%)	Ready (%)
Perceptual Abilities	43	57
Arithmetic Reasoning Skills	40	60
Memory Skills	30	70
Eye Hand Coordination Skills	27	73
Communication skills	100	-
Social Skills	-	100

years. On the other hand, readiness with reference to social skills (SS) was found to be completely acquired on par with their normal peer group.

Duncan *et al.*, (2007) & Pagani *et al.*, (2010) studied early language and reading skills and found it as predictor of later successful reading skills. Focusing importance to the area of communication skills, Boyer (1991) reported that language ability was a highly valued dimension of early development and learning, as demonstrated by a survey of kindergarten teachers who identified language as the area where most “unready” children had difficulty. It is the basic characteristics of hearing impaired children that their speech & language development are delayed due

to the first and foremost impact of hearing loss on them. This, perhaps, may be the probable reason for paying more attention to communication skills for children with hearing impairment before entering into the schools.

Research has also proven the association between social competence and positive intellectual outcomes as well as the link between anti-social conduct and poor academic performance. Programs that have a focus on social skills have improved outcomes related to dropout and attendance, grade retention, and special education referrals. They also have improved grades, test scores, and reading, math, and writing skills (Zins *et al.*, 2004).

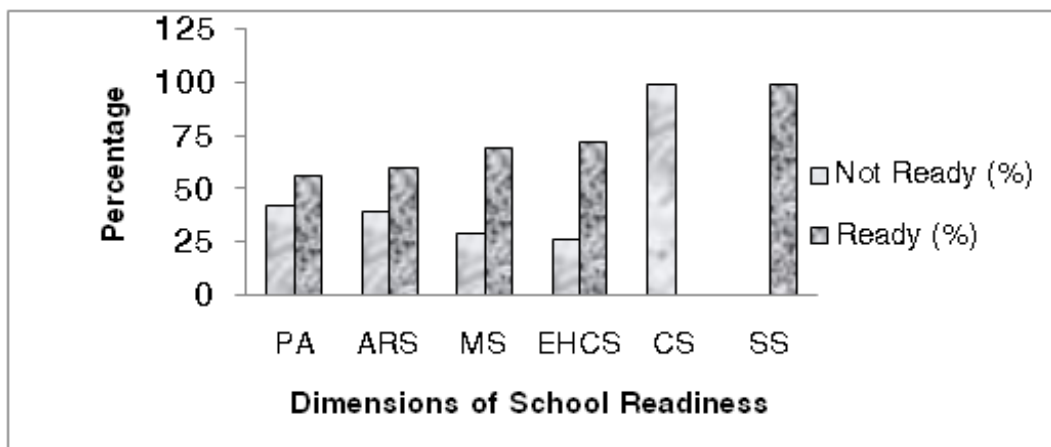


Figure 1. Status of Readiness of the Selected Sample with Reference to Different Dimensions of School Readiness

PA: Perceptual Abilities; ARS: Arithmetic Reasoning Skills; MS: Memory Skills; EHCS: Eye Hand Coordination Skills; CS: Communication Skills; SS: Social Skills

From the above Table 2 it is observed that, while comparing the perceptual abilities of Cochlear Implant and Hearing Aid users,

the correlated t-value is -2.763 which is significant at 0.05 level. Therefore the null hypothesis (H0) stated as “There is no

significant difference between dimensions of school readiness among selected sample in relation to assistive device used” is rejected.

This may be due to the difference in terms of intervention provided and the efforts that they have taken in education.

Table 2. Comparison of Different Dimensions of School Readiness of Selected Sample in Relation to the Assistive Device Used

Dimensions of School Readiness	Assistive Device used	N	Mean	SD	t- value
Perceptual Abilities	Cochlear Implant	20	1.55	0.51	-2.763*
	Hearing Aid	10	2.00	0.00	
Arithmetic reasoning skills	Cochlear Implant	20	1.50	0.513	-1.595
	Hearing Aid	10	1.80	0.422	
Memory Skills	Cochlear Implant	20	1.65	0.489	-0.826
	Hearing Aid	10	1.80	0.422	
Eye hand co-ordination skills	Cochlear Implant	20	1.55	0.510	-1.977
	Hearing Aid	10	1.90	0.316	
Receptive language skills	Cochlear Implant	20	1.00	0.00	-
	Hearing Aid	10	1.00	0.00	
Expressive language skills	Cochlear Implant	20	1.00	0.00	-
	Hearing Aid	10	1.00	0.00	
Social Skills	Cochlear Implant	20	2.00	0.00	-
	Hearing Aid	10	2.00	0.00	

* Significance at 0.05 Level

From the observations it was also clear that the t value of the dimensions arithmetic reasoning skills, memory skills and eye hand coordination skills is not significant. This may be due to the influence of three E’s namely Exposure, Environment and Experience provided.

From Table 3, it is clear that while comparing the results of different dimensions

of school readiness in relation to their age group, the corresponding t value is found to be significant at 0.05 level. It indicates that the readiness skills of the age group ‘2-5 years’ and ‘6-9 years’ differs significantly. Therefore the null hypothesis stated that there is no significant difference between dimensions of school readiness among selected sample in relation to age group was rejected.

Table 3. Comparison of Different Dimensions of School Readiness of Selected Sample in Relation to the Age Group

Dimensions of School Readiness	Age Group (Years)	N	Mean	SD	t- value
Perceptual Abilities	2-5	9	1.33	0.500	-3.254*
	6-9	21	1.86	0.359	
Arithmetic reasoning skills	2-5	9	1.11	0.333	-4.566*
	6-9	21	1.81	0.402	
Memory Skills	2-5	9	1.33	0.500	-2.763*
	6-9	21	1.81	0.402	
Eye hand co-ordination skills	2-5	9	1.33	0.500	-2.763*
	6-9	21	1.81	0.402	
Receptive language skills	2-5	9	1.00	0.00	-
	6-9	21	1.00	0.00	
Expressive language skills	2-5	9	1.00	0.00	-
	6-9	21	1.00	0.00	
Social Skills	2-5	9	2.00	0.00	-
	6-9	21	2.00	0.00	

* Significance at 0.05 level

Summary and Conclusion

There are six dimensions assessed in the study. Among all the six dimensions of school readiness, communication skills were found to pay much more attention for children with hearing impairment before entering into the schools under the existing educational programme. On the other hand, the dimensions of social skills were found to be attained equally on par with their normal peers for children with hearing impairment before entering into the schools.

Effect of different dimensions of school readiness with reference to the assistive device revealed, perceptual abilities dimension

showed statistically significant effect while, dimensions of arithmetic reasoning skills, memory skills, eye hand co-ordination skills showed statistically no significant effect.

Effect of different dimensions of school readiness with reference to the age group revealed, dimensions such as Perceptual abilities Arithmetic reasoning skills, Memory skills, Eye hand co-ordination skills showed statistically significant effect on acquiring skills at appropriate age level comparing with the standard age norms used in the study.

A child's early learning through appropriate diagnosis and intervention provides the foundation for later learning,

when the child is likely to go in for learning more complex skills. Cochlear implant enhances learning of children which enables them to communicate and socialize. Even though children using cochlear implant has the ability to acquire language and communication skills, appropriate training and follow up is required to support and enhance learning. Children with hearing

impairment were not ready on different aspects of school readiness, for gaining their education due to the lack of early intervention services. Hence, early cochlear implant and early diagnosis and appropriate early intervention services and follow up are necessary to develop school readiness skills in children with hearing impairment.

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PROBLEMS AND PROSPECTS OF UNORGANIZED WORKERS: A SPECIAL REFERENCE TO HOME-BASED WOMEN WORKERS AND WOMEN DOMESTIC WORKERS

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Abstract

Informal sector is a very significant sector of the Indian economy. Major part of the labour force in India arrived from unorganized sector. Informal workers including domestic and home-based work like beedi rolling, handloom weaving, handicrafts, and selling vegetables etc. The unorganized workers are living in the below poverty, without having any adequate facilities, working in a most vulnerable environment, and getting very low income that did not effectively meet their daily needs of life. In this study an attempt has been made to analyze the home-based women workers and domestic women workers working in unorganized sector. As it is felt that, not adequate steps being taken up and it needs more understanding and insight into the problems and prospects of such women working in the unorganized sector.

Introduction

The Indian Economy is categorized with a large number of unorganized labour employment. According to the Economic Survey 2007-08, 93 per cent of India's

workforce include the self-employed and employed in the unorganized sector. The Ministry of Labour, Government of India, has categorized the unorganized labour force under four classifications in terms of Occupation, nature of employment, especially distressed categories and service categories..

Characteristics of Unorganized Workers

Home-based and domestic works are low paid and often not regular, mostly, they do not have paid leave, holiday, leave due to sickness and so on. This kind of employment is not secure. These kinds of unorganized workers include a large number of people who are employed through an agent/intermediaries, relatives and friends. In the unorganised sector workers were don't have any fixed and regular terms regarding their employment. They were excluded from the social security measures (Diwaker & Ahamad, 2014). The majority of the workforce were invisible due to no proper accountability or registry maintained by the government or any other welfare organisations (Chandra, 2014; Kaur and Kaur, 2013).

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Home-Based Workers

Home-based workers are the workers who carry out their work at their home or adjacent surroundings or premises (Patel and Pandya, 2017; Muthusamy and Ibrahim, 2016). Unpaid housework or paid domestic work does not demote as Home-based work. There are two broad types of home-based workers: (i) self-employed and (ii) sub-contracted workers.

Domestic Workers

Domestic workers are a unique type of worker because they are neither employed by an enterprise nor self-employed (Chandramouli & Kodandarama, 2018). Rather, they are employed by households. This has implications for estimating national accounts. For this reason, the household / labour force surveys in most countries are able to identify domestic workers and the classification of occupations used in surveys contains codes to identify the full set of jobs that fall into the category of domestic workers (WIEGO: Women in Informal Employment: Globalizing and Organizing).

Statement of the Research Problem

A majority of India's workforce belongs to unorganized sector. The number of workers in the unorganized sector is incessantly growing for various reasons. The focus of women working in the unorganized sector works characterized by low wages, long working hours, exploitation, no bargaining power, illiteracy, helpless, ignorance of social security benefits and protection. So it is an important to study the home-based and domestic women workers working in the unorganized sector.

Objectives of the Study

- I To study the Socio-Demographic Conditions of Home-based Women Workers and Domestic Women Workers working in the unorganized sector.
- II To identify the Problems faced by Home-based Women Workers and Domestic Women Workers working in the unorganized sector.

Methodology

The present study population consisted of Home-based women and Domestic women working in the unorganized sector in Coimbatore city. Out of five zones in Coimbatore city, the North zone was selected as a study area. The sample of the study comprised of total 60 women working as home-based workers and domestic workers. Out of it, 30 home-based women workers and 30 domestic women workers were selected with the help of the snowball sampling method. The collected data were analyzed by using statistical tools such as the Percentage and Garrett Ranking Method.

Results and Discussion

The socio-economic conditions of home-based and domestic women workers are represented in table 1. The study analysis found that the highest (50%) per cent of the home-based women workers were in the age group of above 50 years, followed by 27 per cent were 41-50 years of age, 13 per cent of them come under 20-30 years of age group and ten per cent of them belong to 20-30 years of age group. On the other hand in women domestic workers majority (40%) of them was in the age group of above 50 years, followed by 30 per cent of them belong to 41-50 years, 20 per cent comes

under 31-40 years and remaining 10 per cent of them belong to 20-30 years of age category.

Investigation on marital status of the study population showed that majority (40%) of the home-based women workers were married, followed by 33 per cent of them were widows, likewise, 20 per cent of them were separated and seven per cent of the respondents were unmarried. While analysing the marital status of domestic women workers, the highest (83%) per cent of them were married, ten per cent of the respondents were widows, seven per cent of the respondents were separated and there were no respondents under the unmarried category.

Exploration of the educational qualification showed majority (80%) of the home-based women workers were illiterate, followed by ten per cent of them were studied up to primary level, seven per cent of them have completed their secondary level education and the remaining three per cent of them were completed their higher secondary level education. While analysing domestic workers, the highest (60%) per cent of the respondents were illiterate, followed by 23 per cent of them studied up to secondary level, likewise, 17 per cent were completed their primary level of education and there were no respondents under the category of higher secondary level.

Table 1. Socio-economic Conditions of Home-based and Domestic Women Workers

Variables	Category	Home-based workers	Percentage	Domestic workers	Percentage
Age	20-30 years	4	13	3	10
	31-40 years	3	10	6	20
	41-50 years	8	27	9	30
	Above 50 years	15	50	12	40
	Total	30	100	30	100
Marital Status	Married	12	40	25	83
	Unmarried	2	7	-	-
	Widow	10	33	3	10
	Separated	6	20	2	7
	Total	30	100	30	100
Educational Qualification	Illiterate	24	80	18	60
	Primary	3	10	5	17
	Secondary	2	7	7	23
	Higher Secondary	1	3	-	-
	Total	30	100	30	100
Monthly Income (In Rupees)	Rs.1000-5000	16	53	4	13
	Rs.5001-10000	9	30	18	60
	Above Rs. 10000	5	17	8	27
	Total	30	100	30	100

Source: Primary Data

By analysing the monthly income of the home-based women workers, the majority (16%) of the respondents were earning rupees 1000-5000, followed by 9 per cent were getting rupees 5001-10000 and five per cent of them were getting above 10000 rupees. The highest (60%) per cent of the domestic women workers were earning rupees 5001-10000, followed by 27 per cent of them getting above 10000 rupees and remaining 13 per cent of them were getting 1000-5000 rupees.

Problems Faced by Home-Based Women Workers

- The self-employed home-based workers are overworked and have limited access to education, information and skills are needed to sell their own products in the best markets.
- l Home-based women workers are socially and economically weak and have no bargaining power so it is very difficult for them to sustain.
- l The life of home-based women workers is very difficult because they have to perform the dual role of the family.
- l Inadequate housing conditions: work from home in a poor, unhealthy, congested environment with bad lighting and ventilation.
- l Lack of security measures such as safety, security, health and other needs that let home-based workers pursue their economic activities.

Problems Faced by Domestic Women Workers

- The women domestic workers are deprived of minimum wages, healthy work periods, safe working conditions

and other benefits in the absence of trade unions and state intervention.

- The wage levels of domestic workers are very less than their male counterparts. The employers do not provide extra wages for more workload. Sometimes they were forced to do other tasks which were not linked with their specified regular duties.
- l Domestic workers are highly exploited and denied just wages and humane working conditions.
- l The women domestic workers face major problems such as - low wages, extra work, and long working hours, lack of holidays, harassment, sexual exploitation, physical torture, ill-treatment, lack of welfare facilities, absence of social security measures, and lack of rest.
- l Women domestic workers do not have good socioeconomic conditions and they face problems both at home and at the workplace.

Problems Faced by Unorganized Women Workers

From Table 2, it was understood that work-related problems is the main problem faced by unorganized women workers so this problem was ranked as first. This includes job insecurity, irregular supply of work and lack of concentration in work. The second most important problem is the health problem that is general physical and psychological health-related problems. Social problems ranked as third. Followed by family problems ranked as fourth because most of the unorganized women workers are uneducated and getting very low income. Finally, personal problems ranked fifth.

Table 2. Problems faced by unorganized women workers

Reasons	Garrett Score	Rank
Personal Problems	2869	5
Family Problems	3041	4
Social Problems	3112	3
Work related Problems	3290	1
Health Problems	3257	2

Source: Computed from primary data

Summary and Conclusion

The study concluded that the informal sector workers like home-based and domestic women workers are living a life far below satisfaction. The low income of these workers cannot meet their basic needs of life. Both categories of women workers have to play a dual role of working both inside and outside the home. They live and

work in an unhygienic environment which causes dangerous diseases, due to economic compulsion which forced them to take up the work by which they can earn their livelihood. In order to improve their living and working conditions, the government should recognize the informal sector as more than just a survival sector but a potential engine of growth and have taken steps to nurture the sector.

Suggestions

As per the Unorganized Workers Social Security Act 2008, social security for unorganized workers should be implemented.

The government should develop a mechanism to pay attention to the grievances and the grievances should be redressed periodically to the unorganized labourers.

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* μðo, öÉö.

Abstract

The ancient Tamils perceived the changes in the sky and explored the seasonal changes in the earth accordingly to set up a life in harmony with nature. Investigation of the astronomical records about the planets present in Sangam Tamil literature discovers the connection between astronomical news and the motion of the planets and the life of life in Tamil Literature.

Keywords : Planets, Paripadal, Purananoru, Sangam,Tamil, Literature

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RESEARCH ABSTRACT

SHOPPING BEHAVIOR OF WOMEN DURING COVID-19

* NANDANA, T.S.

** SUNITHA, R.

Abstract

The coronavirus (COVID-19) outbreak is the first and prime human tragedy across the globe, affecting the lives of millions of people. This has seriously affected the global economy as well as the society across the world as it has affected several sectors of the society in different ways. Due to this pandemic, traditional shopping of apparel has been reduced. This current situation shows the possibility of exploring consumer's vulnerability, resilience, and consequent behavioral purchasing outcomes, especially when the COVID-19 pandemic brought uncertainties in terms of consumers' behaviour patterns and responses to companies' efforts to satisfy their needs. This study focuses on the impact of the COVID-19 pandemic on consumer behaviour and the changes in their shopping habits. The shopping behaviour of women during this pandemic, preference for online and offline shopping and the difficulties faced by the consumers due to the pandemic while shopping is surveyed. Online shopping is preferred during the pandemic and the respondents were moderately satisfied with online shopping during the pandemic. Though they were satisfied, some problems were also encountered by the respondents by

online purchase over the direct purchase. The women students were aware of the technical aspects whereas the aged persons are not. On the whole, a reduction in the purchase was also notable during the pandemic.

Keywords: Shopping, Pandemic, online shopping, Cloths

Introduction

The coronavirus disease is a highly transmittable and pathogenic viral infection caused by severe acute respiratory syndrome coronavirus which caused a global pandemic that led to a dramatic loss of human life worldwide. (Shereen *et al.*, 2020) This ongoing COVID-19 pandemic has made many changes in the pattern of the people's behaviour and they follow their preventive measures. Many companies are closed, production is reduced, many lost their jobs, schools and colleges are closed and everyone is working from home and studying from home. According to clinical science, the virus is highly transmittable to other people and it spreads primarily through contacting the infected person, by being airborne through cough or sneeze or even by touching the surface that is contaminated by the virus, so the best way chosen by the government world

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over is to insist on people to stay at home and stay safe. To slow down the rapid spread of the virus, most of the countries across the world restricted social life by avoiding the functioning of schools, universities, offices, institutions, large events and functions. Because of all these the use of energy or electricity demand has reduced. (Ziel, 2020) Due to this unexpected pandemic, most people are anxious, feared due to the new way of lifestyle. This COVID-19 has affected many of their mental health due to many changes caused by the virus in their life. The job loss, lockdown, education, economic problems and all make many of them stressed and depressed due to this pandemic. The positive effect of the lockdown is the non-pollution of the air and water of the environment. The daily increases in the COVID-19 cases and deaths have led to worldwide lockdown, quarantine and some restrictions which have a huge impact on the common people. (Atalan, 2020) Then due to the increase in the number of online shoppers during this pandemic, many of them are using their gadgets most of the time and many online shopping apps are being downloaded in this situation. (Chen *et al.*, 2021). Along with this most of the retail stores and services are also closed. (Mahajan-snidha, 2020). The pandemic has spread fear among all the people in the world and has brought rapid changes in almost every business all over the world and it has changed the behaviour of consumers in their shopping and nature of trading. (Bhatti *et al.*, 2020). Due to the eccentric containment measures, some consumers for instance had to move to online shopping, home deliveries or cashless payment, which

they never used before this pandemic. (Eger *et al.*, 2021) This unexpected lockdown creates an influence on consumer buying behaviour. Online marketing and shopping trends among customers are also squeezed by this epidemic. If the circumstances continue for a longer period, it will not be possible for the big giants such as Myntra, Flipkart, Amazon to retain their workforces as they have huge turnover (Jhamb 2020).

Methodology

The questionnaire is the research instrument that consists of a set of questions that aims to collect information from the respondents. The questionnaire was prepared for the survey to find out the shopping behaviour of women during the COVID-19 pandemic. The questions were in the form of multiple-choice, check box and short answers. The online survey method was used to gather primary data in which a structured questionnaire is filled online by the consumers. So the prepared questionnaire was uploaded in the Google form for the respondents to fill them. The circulation of the questionnaire was done among women through social media platforms like Whatsapp and Instagram. Circulation of questionnaires in online mode was noted to be cost-effective and it helped to reach larger samples too within a short time. Thus the information was collected for the study during May 2021. For the sample size, 250 consumers (respondents) were considered. Out of the overall 250 women, a maximum of the respondents was below the age of 20 and most of them were college-going students. The data collected were then analysed.

Results and Discussion

A maximum of 69.2 per cent of the respondents belonged to the age 20-25 years while 22.4 per cent of them were below 20 years and the remaining respondents who participated in the study were above 25 years of age. Among all the respondents, 51.6 per cent were from urban and 48.4 per cent of them were from rural areas. Majority of the student respondents are residing in urban area. A maximum of 81.2 per cent of the study respondents were students followed by 11.2 per cent of them who were employed and a few were homemakers and businesswomen. Hence, most of the respondents are students and the least of the respondents are doing business. About 54.8 per cent of the respondents earned below Rs. 5000 per month, followed by 24.4 per cent 12.4 per cent and 8.4 per cent of them who earned Rs. 5000 - 25,000 per month, 25,000-45,000 and above 45,000 per month.

About 74% of the respondents prefer to choose online shopping during pandemic and 21.6% of the respondent prefers offline shopping and 1.2% of the respondent choose both online and offline shopping. Then rest of the least respondents buy the materials and stitch their cloth and others did not buy cloth during this pandemic. It was observed that most of the respondents choose online shopping during this pandemic. Among the respondents, 50.4% of them purchase cloth once in 3 months followed by 21.6% respondents purchase once in 2 months and 12% of respondents purchase cloths monthly and 1.6% of the respondents but cloths daily during COVID-19. Others choose cloth once

in 6 months, twice a year or occasionally or when there is need for the same. Hence it is clear that most of them purchase cloth once in 3 months and least respondents purchase cloth daily during the pandemic.

Among the 250 respondents, 73.6% of respondents choose online shopping during this pandemic to reduce the risk of COVID transmission by going out. 20% of the respondents preferred online shopping because of the availability of a wide variety of products and then the least of 4% of the respondent choose online shopping due to easy online mode of payment. Few other respondents had more preference for offline shopping than online shopping. The reason for the preference for online shopping was to avoid the risk of going out and the ease in the mode of payment. As far as the products purchased by the respondents during the pandemic were considered, among 250 women, 62.4% of casual wear, 48.4% of mask and gloves, 22% of home textiles, 13% of functional wear, 6.8% of lounge and followed by 1.2% of products like sustainable cloth, cosmetics, skincare products, personal wear, formal wear, sanitiser, hand wash, study material. Hence, it is understood that most of the respondents purchased casual wear during this pandemic.

As for the comfort of the online shopping of the respondents, the maximum of them expressed that they were comfortable while purchasing by online shopping during COVID-19 as 20.8% of the respondents expressed that they were extremely comfortable while 40.8% of them expressed that they were quite comfortable, 30.4%

of them moderately comfortable and only 8% of them expressed that they were not comfortable with the online shopping. In the analysis made for the problems encountered by the respondents, 46.4% of them underwent problems while doing online purchase and it is understood that they felt delay in delivery during covid-19 and the least of them felt non-delivery of the product as a problem. About 32.8% of them strongly agree that the shopping of cloths during the COVID-19 is less compared to earlier, 39.6% of the respondents agree to the statement, 22% of them gave a neutral response, 5.2% of them disagree with the statement and 0.4% of them strongly disagree with the statement. A maximum of 78.4% of respondents expressed that their personal factors influenced their shopping behaviour and the least of the respondents consider cultural factors while shopping for cloth. A maximum of 59.2% have felt that they were unable to check the fitness of the dress, 48.4% have felt that they were unable to touch and analyze the fabric while shopping and about 27.6% of them felt product unavailability as the difficulty faced in the shopping of the apparel during COVID-19.

Among the respondents, 58.8% preferred cash on delivery, 30% of them prefer net banking and 9.2% of them prefer digital wallets. Others chose Gpay or Google pay. Among the 250 respondents, 76% of the respondents are satisfied by the shopping made during the pandemic and 24% of the respondents are not satisfied by the shopping made during the pandemic. Most of the respondents are satisfied with the shopping made during this pandemic. Among the

250 respondents, 44 had mentioned the reason for non-satisfaction of shopping during COVID-19. Some of them were to avoid the risk of shopping, unable to get more collections within their budget, network issues affect the online shopping, financial crisis due to pandemic, liking towards traditional shopping than online shopping, could neither choose correct fitted garments not touch and feel the material while purchasing them.

Summary

The survey was made to elicit information on the shopping behaviour of women during COVID. There were 250 respondents. From the respondents, the maximum number of the respondents belonged to the age 20-25 years and the least number of respondents were above 30 years of age. Most of them were from urban areas. As for the shopping mode was concerned, the respondents mainly preferred online shopping to offline shopping during this pandemic period. The predominant reason for the preference of online shopping was to avoid the risk of coronavirus attack. The frequency of purchase of cloths was noted to be once in three months and the purchase was made for casual wear during this pandemic. Most of the respondents were quite comfortable with the online shopping done during the pandemic as only a lesser number of them expressed that they were not comfortable with online shopping done for the purchase of dresses during COVID-19.

From the survey, it is obvious that most of them were aware of the latest technology of purchase from social media. The main issue faced by most of the respondents during

online shopping was a delay in delivery of the product, mainly due to sudden lockdowns and high corona cases in some areas. It is vivid from the survey that the main factor that affected the purchase of cloth during COVID-19 was that people were scared of the disease which made them stay at home without going out for purchase. As far as the factors that influenced the shopping behaviour of the respondents were considered, the maximum of them expressed about their personal factors followed by social and psychological factors and the least was the cultural factors. Also, it was noted that the shopping behaviour of the respondents was mainly influenced by their family members while shopping. About the satisfaction level of shopping, it was noted that most of the respondents were

satisfied with the shopping made during this pandemic as others expressed that they are more comfortable in the traditional way of shopping than online shopping and hence a reduction in purchase was noted.

Conclusion

Online shopping is preferred during the pandemic and the respondents were moderately satisfied with online shopping during the pandemic. Though they were satisfied, some problems were also encountered by the respondents by online purchase over a direct purchase. The students were aware of the technical aspects whereas the aged persons were not. A reduction in the purchase was also notable during the pandemic COVID 19.

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NEWS MAKER

COVID-19 VACCINATION DRIVE IN INDIA

* SHANMUGA PRIYA, M.

Emergency Use Authorization (EUA) is a regulatory mechanism to permit and facilitate using medical countermeasures viz., vaccines, drugs or medical devices in an exigent conditions to save people and/or to reduce the effect of life-threatening sickness. Thus, emergency authorization and approval is provided only based on the rigorous scrutiny of the laboratory, manufacturing unit, medicinal product's manufacturing process and its safety clinical trial data for its safety, quality and efficacy. Safety is the essential criterion element of EUA scrutiny wherein the approval is provided only based on the testification that benefits overweighs the risks. COVID-19 emergency crisis demanded the consent of local regulatory body, CDSCO (Central Drug Standard Control Organization) to approve Covishield® (AstraZeneca/Oxford vaccine formulation manufactured in Serum Institute of India) and Covaxin® (Bharat Biotech Limited) vaccine usage for COVID-19. Even, Sputnik - V has also been granted EUA usage in the month of April 2021.

Covaxin® is an indigenous vaccine manufactured using whole-virion inactivated vero cell derived platform technology, a conventional oldest vaccine manufacturing process used for the synthesis of vaccines for

other viral diseases., Influenza, Rabies and Hepatitis-A. In addition to whole inactivated Coronavirus, Covaxin® consists of other components such as Aluminum Hydroxide Gel, TLR 7/eight Agonist, 2-Phenoxyethanol and Phosphate Buffered Saline [NKA1].

Covishield® on the other hand uses viral vector based technology that consists of inactivated adenovirus with segments of coronavirus, Aluminium Hydroxide Gel, L-Histidine, L-Histidine Hydrochloride Monohydrate, Magnesium Chloride Hexahydrate, Polysorbate 80, Ethanol, Sucrose, Sodium Chloride, and Disodium Edetate Dihydrate (EDTA).

Both of these Indian COVID-19 vaccines have completed their Phase I & II trials. Covishield® has finished its Phase III trials in UK and the bridging trial in India.

In common, clinical trial of an Investigational Medical Product (IMP) either (Vaccine / Drug / Device), consists of a clinical developmental cycle that includes three distinct phases. The clinical development process for the vaccine product is explained below:

Pre-clinical: Vaccine development is initiated using laboratory test animals.

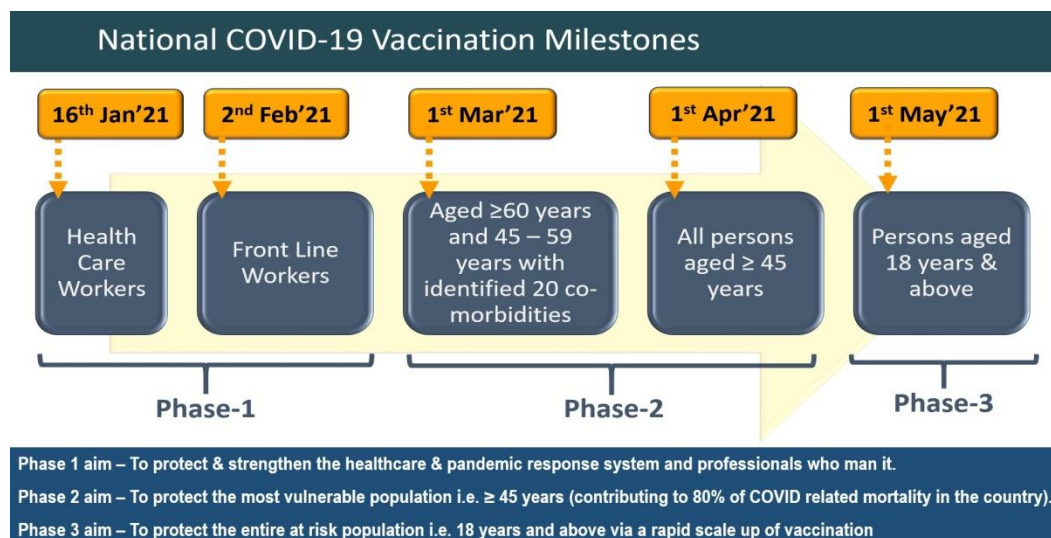
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Phase 1: The trial vaccine is administered to a small wide variety of healthy volunteers to assess its safety, immune response and for the determination of right dosage for a short period

Phase 2: The trial vaccine is administered to few hundred of human participants to assess safety and its ability to develop an immune response for a brief period

Phase 3: The trial vaccine is administered to a large population (1000x) to determine vaccine's efficacy against the disease and safety for a longer duration between 1-2 years.

The COVID-19 vaccination drive began in India on 16th January, 2021. According to the health ministry of India, the first priority of vaccination was given to healthcare and frontline workers followed by elderly people above 60 years of age as of January 1st, 2021 and selectively forty five and fifty nine year old people with co-morbid situations. From the four month period of April 1st, 2021, the people above the age of forty five years (born earlier than 1st Jan, 1977) were allowed to vaccinate. Later on the fifth month of May 1st, 2021, all the eligible residents above 18 years of age were asked to get vaccinated with COVID-19 vaccine.



Despite the fact that COVID-19 impacts all age groups; morbidity & mortality instances are reported to be lesser in adults with age fifty years and above. Also, children are reported to be less affected with asymptomatic, slight or combined SARS nCoV-2 infections. As an ethical safety consideration, any new vaccine is always tested and evaluated in older populace

followed by its evaluation in an decreasing trend of age in life stage and atleast among the paediatric populace. Covishield® and Covaxin® are so far not evaluated in kids. Hence, together with these two, parallely few other COVID trial vaccines are now underway to check their effectiveness and protection against SARS nCoV-2 in kids.

There is no head-to-head assessment executed in between the two vaccines approved on emergency basis and hence one can't pick out one over the other. The protection and efficacy facts of trial vaccines are validated through CDSCO headed by DCGI (Drug Controller General of India) prior to approval. Hence overall, it is presumed that all emergency approved COVID -19 vaccines in India have similar protection and efficacy. It is also essential to note that COVID-19 vaccines aren't interchangeable. However, vaccination drive agenda must be completed as early possible with any one of these two vaccines to come to a conclusion of any possible existence of indirect protection / population immunity / herd immunity. When more people inside a community get vaccinated, it is supposed that oblique safety will arise via the development of herd immunity. Since, the herd immunity varies with disease, the percentage of people who needs to get vaccinated to develop heard immunity is not clear for COVID-19.

Hence, as an numerative assessment aid, Co-WIN portal was launched by Indian government with a goal of all getting vaccinated as early as possible people getting vaccinated from India. COVID Vaccination Centres (both government and private health facilities) are listed for easy registration through online mode and / or offline appointment via Co-WIN portal for vaccination. Few primary steps of individuals

identity details are required to be provided from adhaar card to get registered on-line. In case of Aadhar card usage as identity document, a consent was also received and recorded. Other than the Covid Vaccination listed centres portal also provides dates and time of vaccination slots for each individual registered. An OTP verification is done prior to registration and a affirmation slip/ token is generated after registration with a confirmatory message. For Private Hospitals, early registration and appointment are required as the simplest approach of registration. For Government hospitals, a percentage of slots are prebooked for on-line registrants with few relaxations. Appointments for the vaccination center on any date are not available at 12:00 pm on the day prior to the vaccination. The registration of beneficiary is obligatory for COVID-19 vaccinations. Once registered, notification about the vaccine consultation date and time may be shared with the beneficiary registered mobile number. There may be a provision for walk-in to vaccination centres. However, even for that, a online sign up is required earlier to vaccination. The walk-in alternative is available only for persons above the age of forty five. Registration for vaccination can be done at the Co-WIN Portal vaccination with prior appointment (<https://www.cowin.gov.in/domestic>). Vaccines aren't interchangeable, hence it's essential to acquire the second dose of identical vaccine as the first one.

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SHORT COMMUNICATION

BITE-SIZED LEARNING

* VIDHYA, S.

Learning is a continuous process happening throughout the life of human beings. Systematized learning is the prime concern of the education system. Learning is much deeper than memorization and information recollection. Deep and long-lasting learning involves understanding, relating ideas, and making associations between prior and new knowledge, liberated and critical thinking, and the ability to transfer knowledge to new and different backgrounds. Learning is not somewhat done to students, but rather something students themselves do. It is the direct result of student's understanding and response to their experiences.

Like other fields, the face of education has also evolved radically over the period. Modern education sees a vast scenario that encourages learners to study profoundly and study to satisfy their curiosity. Different teaching and learning methods are introduced along with innovative ways to teach and learn. As a teacher, it could be kept in mind that along with the content, attention must be paid to thinking processes and the types of learning.

In recent years, the scope of knowledge in the field of science and technology has dramatically changed and student's ability to adapt to new knowledge has risen. To cope with the modern world and the knowledge-

driven era of technology, adopting the modern way are the only means to survive.

Accordingly, Digital learning becomes base for all education programs like formal, non-formal, and informal education in the modern era of studying. Digital learning is any type of learning that is accompanied by technology or by instructional practice that makes effective use of technology. It integrates the application of a wide range of practices, including blended and virtual learning.

Good things come in small packages. We live in the age of instantaneous gratification. Over the longer traditional full-length courses, many corporate training professionals are adopting shorter learning sessions. Nowadays, this can be transferred to classroom teaching and learning. This is to help learners engage and retain information. Digital teaching methods offering both teachers and students the ability to learn in an environment that makes use of now-common devices such as smartphones, laptops, and tablets. This can be known as the "bite-sized" approach to learning.

"Bite-Sized Approach" to Learning

Bite-sized learning, or speed learning, is a relatively new approach that takes into account the contemporary demands of learner

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lifestyles that might hinder longer periods of focused study and time spent in the classroom. It utilizes short, focused activities with the explicit aim of increasing learners' knowledge and skills in the target language. Because learners need to fit in with the demands of a modern lifestyle as well as balance their studies with other responsibilities and social activities.

What is Bite-Sized Learning?

Bite-sized e-learning modules are small, self-contained information nuggets. They typically range in duration from 1 to 15 minutes and are usually focused on one or two firmly defined learning objectives. Bite-sized learning, also called microlearning (deal with presenting information on a topic or with a specific learning objective in a quick lesson), is short, and highly focused content based on a single topic or problem. Each unit should have a single learning objective and cover just the information needed for the learner to achieve that objective. It is an e-learning paradigm that helps learners flesh out their understanding of more complex subjects by introducing them slowly to smaller pieces of content that build on each other. A bite-sized training course tries to achieve a specific learning objective, unlike traditional classroom training which focuses on multiple learning objectives.

How Does it Help Teachers?

The "bite-sized" learning concept helps teachers and implementers to pass important information to learners. The study materials/concepts are broken down into

smaller segments, reducing the load on the cognitive memory. Bite-size information makes learners less astounded and helps increase knowledge retention. In this way, the information delivery becomes easier to resume and even shorter periods of teaching/learning can be best utilized.

Three Good Reasons to Adopt Bite-Size Teaching

1. It takes less time to consume and is more flexible
2. Shorter sessions suit modern learners
3. Demand for mobile learning is growing

Advantages of Bite-size Teaching Sessions

- ▮ Creates a better teaching-learning environment
- ▮ Improves retention of difficult concepts
- ▮ Gets more done efficiently in less time
- ▮ Deals with distractions and interruptions
- ▮ Allows easy goal setting and meeting expectations
- ▮ Deals with procrastination
- ▮ Encourages more effective and productive teaching sessions
- ▮ Leads to better results
- ▮ Improves overall performance

Techniques to Plan Bite-sized Teaching Sessions

- ▮ **Shorter PowerPoint presentation:** Long presentations and monotonous PowerPoint sessions tend to distract learners. Short, high pointed important information can involve learners during the presentation.
- ▮ **Use videos:** Short videos of length 5-7 minutes help learners visualize the concept and retain the information.

- 1 **Infographics:** Presenting data and numerical information with useful graphics can be used for a variety of subjects.
- 1 **Keeping sessions shorter and spread them out:** Giving “one bite at a time” i.e. presents one topic during a session and cut short a longer session into a few shorter ones.
- 1 **Making it more informal:** Carrying out teaching sessions in a convenient, fun, informal, and timely manner.

What is a Bite-sized Learning App?

A bite-sized learning app works to provide information in focused bursts for the maximum captivation and maintenance of knowledge for the learners. EdApp is a bite-sized learning app used to train learners in topics chosen by learning and development teachers.

Features of Bite-Size Learning App

- 1 **Short and Concise:** The success of microlearning or bite-sized learning

can be attributed to the fact that modern learners have no patience with long-form of content nowadays. Thus, only the most important information is provided to the learners.

- 1 **Mobile friendly:** It was designed for smartphones. It allows learners to access their course content anytime and anywhere on their smartphones.
- 1 **Just-in-time Learning:** As microlearning is short, it can be used to train the students in a specific skill.
- 1 **Easy to produce:** It is easy for instructional designers and e-learning professionals to produce. The content used in microlearning modules is a compressed and focused form of a much-longer content.
- 1 **Learner-centered:** Microlearning embodies everything that would make it easier for the learners of the future to absorb and retain information, and apply it successfully to their roles and responsibilities.

Micro Learning Apps	Applications
Word of the day	to expand vocabulary
Duolingo	for teaching foreign languages (awarded for the app of the year in 2013)
Instanerd	understanding fun facts
TED-Ed	video library
Chegg's Flashcards+	flashcard maker
Primer	5 minute lessons
Venngage-Infographics	a bunch of information in one large and appealing image
Explain Everything	an interactive screen casting whiteboard
Canva	create presentations, social media graphics, and compelling images
Bookwidgets	interactive lesson with short YouTube videos and game widgets
TES teach	digital lessons
ED puzzle	deliver videos

The following apps are real micro learning applications that anyone can use to become smarter

Along with the upgrades made to the student educational system, the face of teaching is witnessing a transformation in the 21st century. The facility to mix elements such as images, videos, audio and graphics proved to be a more consistent way of keeping learners engaged compared to traditional learning.

Students who are exposed to bite-sized learning, have a better understanding and retention of the subject. For students, who have short attention spans, it offers a quick way to learn without being overwhelmed. Bite-sized courses are fast-paced and interactive. Bite-sized content is easier to

digest, understand and remember. Unlike the traditional approach, it focuses on meeting the needs of modern digital learners.

Bite-sized learning helps to learn content with a more interactive, engaging experience and allows greater control over the time spent on the courses. It is cost-effective, saves time, improves performance, and greater productivity with a lower environmental impact. Thus, technology provides us with powerful tools to try out different designs. Furthermore, bite-sized learning can get delivered in many forms: including e-learning, as long as it's focused on a specific learning objective. It offers more benefits including flexibility, accessibility, and just-in-time training for learners.

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BOOK REVIEW

INSTITUTIONAL RURAL CREDIT MANAGEMENT

Author : Madhu Shreya
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The book entitled “Institutional Rural Credit Management” narrates the evolution and growth of banking in India. It covers medieval, time, colonial era and the modern time development of banking. The revolution in the field of credit management has brought enormous benefits to the banking sector.

The Reserve Bank of India (RBI) plays a important part in the Development Strategy of the Government of India. The central banks is an independent apex monetary authority which regulates banks and provides important financial services like storing of foreign exchange reserves, control of inflation, and implement monetary policy with its instruments and thereby help the smooth functioning of the economy. Qualitative and qualitative credit control measure give wide scope for taking steps to promote the working of banking sector.

The author gives the different types of financial institution prevailing in several parts of the globe. He explains these with typical examples and the diverse ways in which it works. Cooperative banks are often regulated under both banking and cooperative legislation. They provide services such as

savings and loans to non – members as well as to members and some participate in the wholesale markets for bonds, money and even equities.

A credit union is a member - owned financial cooperative, controlled by its members and operated on the principle of people helping people, providing its members credit at competitive rates as well as other financial services. Credit unions proved that they could meet the demand for financial services that banks could not do for professional, middle class and poorer people. Those that served poorer urban and rural communities became an important source of microfinance.

Further the history and development of cooperative banking in various countries are highlighted by the author. He comments on the Federations and auditing associations. The federating approach marked a distinctive departure from conventional thinking about economies of scale in business. Traditional businesses achieved scale through a single, centralized head-office with power delegated to braches.

Small finance banks are a type of niche banks in India. Banks with a small finance can provide basic banking services of acceptance of deposits and lending. The aim behind these is to provide financial inclusion to sections of the economy not being served by other banks, such as small business units, small and marginal farmers, micro and small industries and unorganised sector entities.

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Microfinance includes microcredit, the provision of small loans to poor clients; savings and checking accounts; micro insurance; and payment systems. Microfinance services are designed to be more affordable to poor and socially marginalized customers and to help them become self-sufficient. Micro finance 's emphasis on female - oriented lending is the subject of controversy, as it is claimed that microfinance improves the status of women through alleviation of poverty. It is argued that by providing women with initial capital, they will be able to support themselves..

Micro-financing is based on the philosophy that even small amounts of credit can help end the cycle of poverty. Another benefit produced from the micro-financing initiative is that it presents opportunities, such as extending education and jobs. Families receiving micro-financing are less likely to pull their children out of school for economic reasons. As well, in relation to employment, people are more likely to open small business that will aid the creation of new jobs.

Micro credit is widely used in developing countries and is presented as having "enormous potential as a tool for poverty alleviation." Microcredit is a tool that can be helpful to possibly reduced feminization of poverty in developing countries.

Lending to women has become an important principle in microcredit, with banks and NGOs catering to women exclusively. The author highlights a new strategy to combine micro credits with health - care services, since the health of their clients is crucial to the success of micro credits. Though Grameen Bank initially tried to lend to both men and

women at equal rates, women presently make up seventy - five percent of the bank's clients. Exclusive lending to women began in the 1980s when Grameen Bank found that women have higher repayment rates, and tend to accept smaller loans than men.

In India, the national bank of agriculture and rural development (NABARD) finances more than 500 banks that on - lend funds to self - help groups (SHGs). SHGs comprise twenty or fewer members, of whom the majority are women from the poorest castes and tribes.

There is a mention on Demonetization in the book. He describes how India demonetised its 500 and 100 rupee notes on 8 November 2016. The demonetisation action was intended to unearth hoarded money, unaccounted cash, and sponsorship of terrorism, but the impact was terrible on common man which o led to long queues in front of banks,, leaving more than 30 people dead and inadequate supply of cash.

Restructuring is the corporate management term for the act of reorganizing the legal, ownership, operational, or other structures of a company for the purpose of making it more profitable, or better organized for its present needs.

The book offers information on several aspects in Agriculture, Banking, Microfinance, Monetary policy and other related issues .The book can be recommended for students in Economics, Management and Sociology. For the laymen also it gives a very useful information in understanding the functioning of the economy.

* **Sherly Thomas**

Research Highlights

Vol. 31, No. 3, 2021

RESEARCH ARTICLES

- | | |
|---|--|
| 1. COVID-19 Fallouts and Fungal Disease Outbreak - An Outlook
Thyagarajan, S.P. ... 129 | 5. Problems and Prospects of Unorganized workers: A special reference to Home-based Women Workers and Women Domestic Workers
Jayarath, G., Baranipriya, A. & Sivasankaran ... 160 |
| 2. Growth and Achievement of Women Entrepreneurship in India
Kashuri, B. & Venkita, D. ... 139 | 6. தமிழ் இலக்கியங்களில் காமம்
Ravi, B. ... 165 |
| 3. Assessing the Possibilities of Recovering Resource from Vegetable and Flower Waste
Vinuthini, R. & Suresh, D. ... 145 | RESEARCH ABSTRACT ... 170 |
| 4. Appraising School Research Skills among Children with Hearing Impairment
Sathi Velu & T Geetha ... 153 | NEWS MAKER ... 175 |
| | SHORT COMMUNICATION ... 178 |
| | BOOK REVIEW ... 183 |