A Study on Impact of Covid-19 on Elderly Population

Darshan K
Department of Management Studies,
M S Ramaiah University of Applied Sciences, Bengaluru, India
darshandanny111@gmail.com

Jahnavi A N
Department of Management Studies,
M S Ramaiah University of Applied Sciences, Bengaluru, India
jahnaviankam1997@gmail.com

Ruchitha K P
Department of Management Studies,
M S Ramaiah University of Applied Sciences, Bengaluru, India
ruchiiprakash@gmail.com

Srinivasa V
Department of Management Studies,
M S Ramaiah University of Applied Sciences, Bengaluru, India
mr.srinivasav@gmail.com

Ms. Shilpa R G
Assistant Professor, Department of Management Studies,
M S Ramaiah University of Applied Sciences,
Bengaluru, India
shilparg.ms.mc@msruas.ac.in

Abstract

Early studies have already reported an increase in anxiety, and depression in the general population, especially those facing extended lockdowns. These effects are magnified in the elderly population due to stricter lockdowns, higher threat of illness, and loss of social support. Older people are being challenged by requirements to spend more time at home, lack of physical contact with other family members, friends and colleagues, temporary cessation of employment and other activities; and anxiety and fear of illness and death of their own and others. It is therefore important that we create opportunities to foster healthy ageing during the pandemic. Population considered for this study was elder individuals from age 60 to 90 of Bangalore urban region. Questionnaire survey based on Likert scale was used in this study and data was collected from 152 elder people. Prior to that, the developed questionnaire was subjected to a pilot study and reliability of the questionnaire was checked by finding the Cronbach's alpha value. Descriptive analysis and independent sample t-test were conducted to reach the objectives.

Keywords
Covid-19, elderly population, mental health, social wellbeing, digital literacy

1. Introduction

COVID-19 has spread worldwide causing an unprecedented public health crisis and drastically changing the lives of countless members of the general population. Widespread lockdown and preventative measures have isolated individuals, affected the world economy, and limited access to physical and mental healthcare (Conroy, K.M., Krishnan, S., Mittelstaedt, S. and Patel, S.S., 2020). While these measures may be necessary to minimize the spread

of the virus, the negative physical, psychological (loneliness, anxiety depression, willpower) (Raihan, M.M.H., 2020), and social effects (social support, economic wellbeing) are evident(De Pue, S., Gillebert, C., Dierckx, E., Vander Hasselt, M.A., De Raedt, R. and Van den Bussche, E., 2021). The government has initiated many health insurance policies for the individuals affected by COVID-19 but the delay in the implementation and lack of awareness among the older people lead to the ineffectiveness of such programs.
The Covid-19 pandemic has shed the light on the healthcare resources which have caused difficulty accessing healthcare resources for non-COVID-related problems, resulting in a higher risk of poor outcomes for those suffering from other diseases. Covid-19 has created increased challenges for elder populations in using the technology to access the necessities such as connecting with close ones, online shopping for medicine essential food supplies, etc.
The lack of awareness about the preventative measures, symptoms of covid, vaccination during the initial phase of covid-19, norms, and principles laid down by the Indian government. (National Programme for the Health Care of Elderly (NPHCE))

1.1 Objectives

1. To understand the awareness of symptoms, measures to be taken for the prevention of covid-19 among the elderly population
2. To analyze if they were provided assistance and support during the pandemic.
3. To analyze the challenges faced response and necessary changes they have adapted in their lives due to the pandemic.
4. To analyze the social support, economic well-being, and inconvenience of the elderly population during and after the pandemic.
5. To analyze the awareness about government initiatives and policies provided to the elderly population during and after the pandemic.

2. Literature Review

Mohammad Mojammel and Hussain Raihan (2020) discussed the mental health impact of COVID-19 experienced by the general adult population. An overlooked aspect of human health is the psychological impacts of any disaster; thus, research data on the direct mental health effect of COVID-19 on general individuals, in particular, this review suggests that existing medical conditions of adults are linked to psychological distress. Kristina M. Conroy, Srikripa Krishnan, Stacy Mittelstaedt, and Sonny S. Patel (2020) discussed the practicalities of using emerging technologies to address elderly loneliness and its implications and adaptations to the outbreak of coronavirus disease–2019. Technological advancements have already helped to address loneliness; hopefully, greater attention to the problem of loneliness will inspire new ideas for incorporating and developing new technology for the elderly. Setayesh Sattari and Soniya Billore, aims to explore the respective risk perception toward the Covid-19 pandemic among the elderly in two developing countries and their lifestyle change and adaptation behavior. This also suggests that the elderly should be considered an important resource in disaster planning, response, and outreach efforts as they seem to adapt very quickly and well to the Covid-19 situation. Lorena García-Fernández, Verónica Romero-Ferreiro, Pedro David López-Roldán, Sergio Padilla, Roberto Rodriguez-Jimenez (2020) assess COVID-19 outbreak-related emotional symptoms, identify gender differences, and study the relationship between the emotional state and environmental features in the elderly. Overall, results show that those above 60 are less vulnerable than younger participants to suffering from depression and acute stress. Daoust, J.F(2020) comments that this study will provide the following, the first thorough description of the most vulnerable population's attitudes and compliance in a comparative perspective, suggest that governments' strategies toward elderly people are far from successful and shows that methodologically, we should be more cautious in treating age as having a linear effect on COVID-19 related outcomes. Gabrielle Martins van Jaarsveld (2020) highlights the need for increased attention and resources to go toward improving digital literacy in the elderly, the need to put in place measures to offer immediate solutions during the COVID-19 crisis, and solutions to close the digital divide for good in the long-term. Kunho Lee, Goo-Churl Jeong 1, and JongEun Yim (2020), explored factors—including pandemic-induced stress, self-integration, self-literacy, and resilience—to prepare practical and detailed suggestions and guidelines using studies that considered these factors, including coping with COVID-19-induced stress, social support, and physical activity.

3. Methods

This is a very important area of research as it lays the foundation for the proposed work. The correctness and robustness of the findings depends on the design that is laid. For the present study, the components of the design are as follows:

- Sample: the elderly individuals age 60-90 from Bangalore urban region were considered

- Nature of the data and source: The investigation is based on primary, which is collected from the questionnaire survey
- Research methods: The statistical tool (SPSS software) that have been used is the T-test for comparative analysis between dependent and independent variable.

4. Data Collection

Relying on correct data is very important as the validity depends on the accuracy of the data collected. This study used primary data collected from the elderly population for the accomplishment of the objectives. Primary data was collected through a structured questionnaire consisting of 35 items. A pilot study was carried out before administering the questionnaire to the larger population to analyze the questionnaire's validity and reliability. The researcher administered the questionnaire directly to the respondents and collected data from a sample of 152 respondents belonging to the Bangalore urban region.

5. Results and Discussions

5.1 Numerical results

Independent sample T-test for each objective

The Independent Samples t-Test analyses the means of two independent groups to see if there is statistical evidence that the related population means differ substantially. A parametric test is the Independent Samples t-Test.

For Objective 1: Awareness about symptoms, measures to be taken for prevention of covid-19 among elderly population
In order to analyze the above objective, past medical history has a criterion (Independent Variable) was considered and t-test was used to analyze

From the result (Figure 1), it is clear that the mean difference for the dependent variable related to health is higher when compared to other variables. We can say that there is a high chance of the
spread of COVID-19 among elderly people who have a past medical history.

T-Test

[DataSet2]

Group Statistics

	Past medical history	N	Mean	Std. Deviation	Std. Error Mean
Technology	2	73	.0721302740	.9312486924	.1089944153
	1	79	-.066651519	1.061137437	.1193872891
Preventative_measures	2	73	-.061517671	1.045439522	.1223594410
	1	79	.0568455696	.9592758808	.1079269687
Related_to_health	2	73	-.144774247	1.032615109	.1208584570
	1	79	.1337791139	.9559724737	.1075553064
Governament_policies	2	73	.0191931507	1.036574097	.1213218215
	1	79	-.017735696	.9712880347	.1092784416
Social_wellbeing	2	73	-.055220959	1.098916960	.1286185017
	1	79	.0510267089	.9031500118	.1016123151

Figure 1. Objective 1 t-Test

For Objective 2: Assistance and support during the pandemic.
In order to analyze the above objective, Education level has a criteria (Independent Variable) was considered and and t-test was used to analyze:

From the result (Figure 2), it is clear that the mean difference for the dependent variable related to "Technology" is higher when compared to other variables.

T-Test

Group Statistics

	Education level	N	Mean	Std. Deviation	Std. Error Mean
Technology	2	63	-.044686825	1.011906339	.1274882154
	1	89	.0316326966	.9960138865	.1055772608
Preventative_measures	2	63	-.095764444	.8676800398	.1093174097
	1	89	.0677884270	1.083634967	.1148650768
Related_to_health	2	63	.4737917460	.8061546326	.1015659370
	1	89	-.335380337	.9917512668	.1051254240
Governament_policies	2	63	.2080566667	.9382095159	.1182032884
	1	89	-.147276292	1.021183045	.1082451863
Social_wellbeing	2	63	.1622342857	1.028626544	.1295947632
	1	89	-.114840225	.9686415638	.1026758004

Figure 2. Objective 2 t-Test

For Objective 3: To analyse challenges faced, response and necessary changes they have adapted in thier life due to pandemic
In order to analyze the above objective, Education level has a criteria (Independent Variable) was considered and and t-test was used to analyze:

From the result (Figure 3), it is clear that the mean difference for the dependent variable related to "Preventative measures" is higher when compared to other variables. It can be concluded that impact on the health of old people is more also to adapt to new norms people should be educated.

T-Test

Group Statistics

	Education level	N	Mean	Std. Deviation	Std. Error Mean
Technology	2	63	-.044686825	1.011906339	.1274882154
	1	89	.0316326966	.9960138865	.1055772608
Preventative_measures	2	63	-.095764444	.8676800398	.1093174097
	1	89	.0677884270	1.083634967	.1148650768
Related_to_health	2	63	.4737917460	.8061546326	.1015659370
	1	89	-.335380337	.9917512668	.1051254240
Governament_policies	2	63	.2080566667	.9382095159	.1182032884
	1	89	-.147276292	1.021183045	.1082451863
Social_wellbeing	2	63	.1622342857	1.028626544	.1295947632
	1	89	-.114840225	.9686415638	.1026758004

Figure 3. Objective 3 t-Test

For Objective 4: To analyze the Social Support, Economic Well being and inconvinence of the elderly people during and after **pandemic:**
In order to analyze the above objective, occupation has a criteria (Independent Variable) was considered and and t-test was used to analyze:

From the result (Figure 4), it is clear that the mean difference for the dependent variable related to "Social wellbeing" is higher when compared to other variables. Economic well has more impact on leading life in times of Covid.

T-Test

Group Statistics

	Occupation	N	Mean	Std. Deviation	Std. Error Mean
Technology	2	123	.0423901626	.9916947124	.0894181009
	1	29	-.179791379	1.032671787	.1917623368
Preventative_measures	2	123	-.028197642	.9966130364	.0898615712
	1	29	.1195972414	1.023165867	.1899971318
Related_to_health	2	123	.0967987805	.9788117407	.0882564825
	1	29	-.410559310	1.001327929	.1859419284
Governament_policies	2	123	.0756774797	1.004493608	.0905721385
	1	29	-.320977586	.9298396835	.1726668945
Social_wellbeing	2	123	.0407643089	1.030688747	.0929340746
	1	29	-.172897586	.8520061101	.1582135627

Figure 4. Objective 4 t-Test

For Objective 5: Awareness on Govertnment Schemes and Insurance Policy
In order to analyze the above objective, Education level has a criteria (Independent Variable) was considered and and t-test was used to analyze:

From the result (Figure 5), it is clear that the mean difference for the dependent variable related to "Government Policies" is higher when compared to other variables. Also, we had created awareness among the elderly people about the govt schemes and policies which intern is dependent on the education level

T-Test

Group Statistics

	Education level	N	Mean	Std. Deviation	Std. Error Mean
Technology	2	63	-.044686825	1.011906339	.1274882154
	1	89	.0316326966	.9960138865	.1055772608
Preventative_measures	2	63	-.095764444	.8676800398	.1093174097
	1	89	.0677884270	1.083634967	.1148650768
Related_to_health	2	63	.4737917460	.8061546326	.1015659370
	1	89	-.335380337	.9917512668	.1051254240
Governament_policies	2	63	.2080566667	.9382095159	.1182032884
	1	89	-.147276292	1.021183045	.1082451863
Social_wellbeing	2	63	.1622342857	1.028626544	.1295947632
	1	89	-.114840225	.9686415638	.1026758004

Figure 5. Objective 5 t-Test

Correlation Matrix: The correlation matrix below (figures 6) how's the correlation coefficients between several variables related to our survey. Each cell in the table shows a correlation between two specific variables.

- The highlighted cell (Blue) shows the correlation between "I have reduced my visits to crowded areas" and I have reduced follow up for acute illness "is 0.618, which indicates that they are strongly positively correlated. More reduced visits to crowded places reduce acute illness.
- The highlighted cell (Pink) shows the correlation between "I have Vaccinated" and "I have reduced follow up for acute illness "is -0.203, which indicates that they are weakly negatively correlated. Higher the percentage of vaccination results in reduced acute illness.
- The highlighted cell (Orange) shows the correlation between "Affected by Covid-19" and "To be safe and keep oneself safe, follow up the precautionary measure also perform regular exercise "is 0.00, which indicates that they are not correlated. There is very little association between the person affected by Covid-19 and the precautionary measure and exercises performed.
- Also, we can notice that the coefficients along the diagonal of the table are all equal to 1 because each variable is perfectly correlated by itself (Figure 6)

Correlation Matrix

Correlation Matrix[a]

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27
Correlation	Q1	1.000	.412	.128	.130	.382	.250	.104	.180	.251	.250	.182	.147	-.056	.286	.236	.257	.231	-.029	-.018	.084	.066	.134	.118	.176	.135	.054	.213
	Q2	.412	1.000	.420	.290	.138	.090	.196	.097	.138	.259	.248	.188	.275	.212	.159	.124	.237	.244	.162	.064	.072	.094	.200	.164	.025	.020	.129
	Q3	.128	.420	1.000	.244	.075	.079	.164	.137	.144	.032	.122	.146	.329	.150	.156	.091	.196	.270	.198	.110	.176	.133	.237	.168	.031	.087	-.082
	Q4	.130	.290	.244	1.000	.165	.158	.088	.110	.136	.054	.152	.188	.338	.262	-.005	.145	.073	.132	.110	.161	.235	.062	.231	.188	-.153	-.016	.000
	Q5	.382	.138	.075	.165	1.000	.342	.193	.207	.255	.303	.298	.091	.064	.308	.216	.320	.301	-.095	-.103	-.009	-.050	.086	.056	.031	-.009	.034	.117
	Q6	.250	.090	.079	.158	.342	1.000	.119	.134	.364	.331	.121	.138	.021	.373	.382	.319	.194	-.027	-.101	-.054	-.021	.136	.086	-.045	.198	.056	.047
	Q7	.104	.196	.164	.088	.193	.119	1.000	.364	.307	.300	.532	.494	.284	.313	.264	.076	.057	.297	.176	.158	-.041	.153	.117	.271	-.119	-.127	.134
	Q8	.180	.097	.137	.110	.207	.134	.364	1.000	.513	.263	.370	.243	.086	.148	.244	.200	.051	.190	.081	.170	.194	.084	.190	.189	.065	.048	-.048
	Q9	.251	.138	.144	.136	.255	.364	.307	.513	1.000	.509	.214	.360	.002	.400	.443	.232	.145	.000	-.003	.124	-.056	.214	.196	.196	.049	-.078	.049
	Q10	.250	.259	.032	.054	.303	.331	.300	.263	.509	1.000	.460	.484	.023	.462	.447	.217	.226	.040	.007	.092	-.059	.193	.216	.240	.144	-.119	.177
	Q11	.182	.248	.122	.152	.298	.121	.532	.370	.214	.460	1.000	.592	.306	.327	.392	.279	.194	.331	.255	.196	.077	.100	.195	.326	.130	-.029	-.016
	Q12	.147	.188	.146	.188	.091	.138	.494	.243	.360	.484	.592	1.000	.202	.303	.313	.181	.010	.218	.238	.215	.015	.176	.129	.310	-.037	-.051	.086
	Q13	-.056	.275	.329	.338	.064	.021	.284	.086	.002	.023	.306	.202	1.000	.174	.117	.023	.068	.563	.390	.315	.330	.140	.218	.237	-.118	.284	-.157
	Q14	.286	.212	.150	.262	.308	.373	.313	.148	.400	.462	.327	.303	.174	1.000	.520	.313	.284	.133	.207	.177	.041	.210	.270	.261	.092	-.008	.087
	Q15	.236	.159	.156	-.005	.216	.382	.264	.244	.443	.447	.392	.313	.117	.520	1.000	.447	.407	.116	.138	.150	.088	.267	.158	.227	.262	.019	-.024
	Q16	.257	.124	.091	.145	.320	.319	.076	.200	.232	.217	.279	.181	.023	.313	.447	1.000	.315	-.069	-.097	-.007	.033	.014	.191	.022	.288	.033	.056
	Q17	.231	.237	.196	.073	.301	.194	.057	.051	.145	.226	.194	.010	.068	.284	.407	.315	1.000	-.061	-.125	-.158	-.131	.024	.013	-.066	.122	-.057	-.014
	Q18	-.029	.244	.270	.132	-.095	-.027	.297	.190	.000	.040	.331	.218	.563	.133	.116	-.069	-.061	1.000	.422	.252	.171	.002	.137	.211	-.038	.215	-.214
	Q19	-.018	.162	.198	.110	-.103	-.101	.176	.081	-.003	.007	.255	.238	.390	.207	.138	-.097	-.125	.422	1.000	.619	.463	.200	.352	.430	-.108	.189	-.199
	Q20	.084	.064	.110	.161	-.009	-.054	.158	.170	.124	.092	.196	.215	.315	.177	.150	-.007	-.158	.252	.619	1.000	.517	.338	.356	.542	.265	.052	-.154
	Q21	.066	.072	.176	.235	-.050	-.021	-.041	.194	-.056	-.059	.077	.015	.330	.041	.088	.033	-.131	.171	.463	.517	1.000	.307	.389	.312	-.013	.403	-.088
	Q22	.134	.094	.133	.062	.086	.136	.153	.084	.214	.193	.100	.176	.140	.210	.267	.014	.024	.002	.200	.338	.307	1.000	.449	.654	-.044	.026	.116
	Q23	.118	.200	.237	.231	.056	.086	.117	.190	.196	.216	.195	.129	.218	.270	.158	.191	.013	.137	.352	.356	.389	.449	1.000	.461	.103	.082	-.152
	Q24	.176	.164	.168	.188	.031	-.045	.271	.189	.196	.240	.326	.310	.237	.261	.227	.022	-.066	.211	.430	.542	.312	.654	.461	1.000	-.024	.002	.040
	Q25	.135	.025	.031	-.153	-.009	.198	-.119	.065	.049	.144	.130	-.037	-.118	.092	.262	.288	.122	-.038	-.108	.265	-.013	-.044	.103	-.024	1.000	.124	.036
	Q26	.054	.020	.087	-.016	.034	.056	-.127	.048	-.078	-.119	-.029	-.051	.284	-.008	.019	.033	-.057	.215	.189	.052	.403	.026	.082	.002	.124	1.000	-.167
	Q27	.213	.129	-.082	.000	.117	.047	.134	-.048	.049	.177	-.016	.086	-.157	.087	-.024	.056	-.014	-.214	-.199	-.154	-.088	.116	-.152	.040	.036	-.167	1.000

Figure 6. Correlation matrix related to survey generated with SPSS software

5.2 Graphical results

Scree plot: A scree plot is a graphical technique for determining the number of relevant components or factors to evaluate in a principal components analysis or a factor analysis.

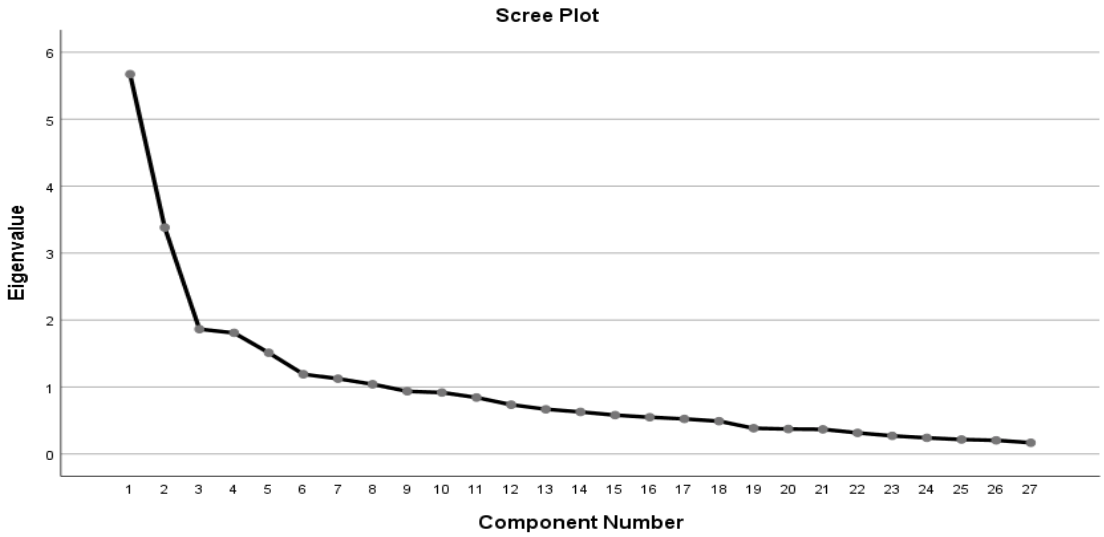

Figure 7. Scree plot

The eigen values for the components 1 to 8 are higher than 1, 8 components are considered for the factor analysis. (Figure 7).

6. Conclusions

This study was conducted aiming to understand the severity and effects of covid-19 on the elderly population.

Various aspects were analyzed to understand the situation and response of the elderly population during and after the pandemic. Different aspects were analyzed by considering the objectives of the study and the questionnaire was developed. The data was collected through a questionnaire on the Likert scale to understand the response of the elderly population.

The questionnaire was prepared considering the factors like if they were aware of the symptoms, and the preventive measures to be taken, we discovered that they were not aware of them initially during the onset of the pandemic while the awareness was created gradually which also resulted in them getting used to following the covid-19 protocols. An analysis of the challenges they faced, how they responded to the different situations, and the necessary changes they have adapted in their life due to the pandemic was done which revealed the lack of awareness on using the technological applications, difficulties in using smart devices and impact ongoing cash to the cashless transaction was studied.

The study also focused on the effects of the pandemic on mental health, the support, and assistance they were provided during and after the pandemic, the social support, economic well-being the inconvenience faced by the elderly population. Through the combined aspect of economic wellbeing and awareness, the study also had a major objective of creating awareness about the government initiatives, schemes, and policies provided to the elderly population.

References

Conroy, K.M., Krishnan, S., Mittelstaedt, S. and Patel, S.S., Technological advancements to address elderly loneliness: Practical considerations and community resilience implications for COVID-19 pandemic. *Working with Older People, 2020*.

Daoust, J.F., Elderly people and responses to COVID-19 in 27 Countries. *PloS one*, *15*(7), 2020.

De Pue, S., Gillebert, C., Dierckx, E., Vanderhasselt, M.A., De Raedt, R. and Van den Bussche, E., The impact of the COVID-19 pandemic on wellbeing and cognitive functioning of older adults. *Scientific reports*, *11*(1), pp.1-11, 2021.

García-Fernández, L., Romero-Ferreiro, V., López-Roldán, P.D., Padilla, S., Calero-Sierra, I., Monzó-García, M., Pérez-Martín, J. and Rodriguez-Jimenez, R., Mental health impact of COVID-19 pandemic on Spanish healthcare workers. *Psychological medicine*, *52*(1), pp.195-197, 2022.

Lee, K., Jeong, G.C. and Yim, J., Consideration of the psychological and mental health of the elderly during COVID-19: A theoretical review. *International journal of environmental research and public health*, *17*(21), 2020, p.8098.

Martins Van Jaarsveld, G.,The effects of COVID-19 among the elderly population: a case for closing the digital divide. *Frontiers in psychiatry*, p.1211, 2020.

Raihan, M.M.H., Mental health consequences of COVID-19 pandemic on adult population: A systematic review. *Mental Health Review Journal, 2020*.

Sattari, S. and Billore, S., Bring it on Covid-19: being an older person in developing countries during a pandemic. *Working with Older People, 2020*.

Biographies

Darshan K has completed Bachelor of commerce from Acharya Bangalore B School. He is currently pursuing Master of Business Administration in Banking and Finance from M S Ramaiah University of Applied Sciences, Bangalore.

Jahnavi A N has completed Bachelor of Engineering in Computer Science Engineering from Bapuji Institute Of Engineering Technology, figureDavanagere. She is currently pursuing Master of Business Administration in Banking and Finance from M S Ramaiah University of Applied Sciences, Bangalore.

Ruchitha K P has completed Bachelor of Engineering in Computer Science Engineering from Sambhram Institute Of Technology, Bangalore. She is currently pursuing Master of Business Administration in Banking and Finance from M S Ramaiah University of Applied Sciences, Bangalore.

Srinivasa V has completed Bachelor of Engineering in Electronics and Communication Engineering from Dr. Ambedkar Institute Of Technology, Bangalore. He is currently pursuing Master of Business Administration in Business Analytics from M S Ramaiah University of Applied Sciences, Bangalore.

Ms. Shilpa R.G. has completed Bachelor of Science and Master of Computer Applications from Shivaji University, Kolhapur, Maharashtra. She is currently pursing Ph.D. in Security Testing under Faculty of Engineering and

Technology, M S Ramaiah University of Applied Sciences. She is presently working as Assistant Professor, Department of Management Studies, Faculty of Management and Commerce. M S Ramaiah University of Applied Sciences. She has more than 22 years of experience in teaching and research and has published more than 15 papers in International and National Journals and Conferences. She has expertise in the areas of Software Engineering, Security Testing, Information Systems Analysis and Design, Operations Management, Supply Chain Management, Software Project Management, Enterprise Resource Planning (ERP), SAP ERP. She has worked as an Associate Head, RUAS Innovation Center. She is a member of IEEE Student Branch Bangalore Section. Her research interest includes Software Engineering, Supply Chain Management, Business Analytics and Entrepreneurship.