

Ecologists' Experiences on 'Work from Home' during the COVID-19 Pandemic

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ABSTRACT This paper's primary objective was to investigate the experiences of ecologists in an Indian research institute regarding Work from Home (WFH) during the first wave of the COVID-19 pandemic. Purposive and volunteer sampling of 52 respondents of different age groups (21-30, 31-40, 41-50, 51-60 years) and professional positions (research fellows, research scholars, research associates) was conducted. The study revealed that young ecologists perceived a steady decline in productivity and working hours during WFH. Furthermore, there was no significant relationship between the perceived increase in working hours and the perceived increase in productivity while working from home. Ecologists are usually recognised as scientific workers in outdoor fields and this paper analysed their work-life experiences when their fields got restricted to indoors. Providing a new perspective on human's collective interaction with their job environment, this paper is metaphoric to an intermediate progress report preparing the world for future virtual working scenarios.

INTRODUCTION

The sudden outbreak of the COVID-19 pandemic propelled everyone to question when their lives shall return to normalcy. In addition to risking physiological health, such pandemics can cause mental disorders like stress, anxiety, and panic attacks depending on socio-personal drivers (Person et al. 2004; Wheaton et al. 2012). While the biomedical world strived to develop the COVID-19 vaccine, people were left with the options of physical distancing and sustaining social connections within households (Nilima et al. 2021). Public health policies were largely reformed and it was reiterated to stay at home as per the guidelines of the World Health Organisation (WHO 2020; Haleem et al. 2020). Facemasks were mandated with the stringent imposition of penalties for breaching the health directives (Rab et al. 2020). In addition to the social health advisories, on the professional front, this viral pandemic restricted most professionals to digital meetings and virtual discussions (Deshmukh and Haleem 2020), which is otherwise referred to as Work from Home (WFH).

The concept of WFH evolved through innovations in telecommunications technology (Shamir and Salomon 1985; Venkatesh and Vitalari 1992). Baker et al. (2007) suggested that WFH is an attractive option to workers with eldercare responsibilities, and to men seeking to engage in home career activities. Similar studies have observed that many more employees are interested in WFH than engage in the work arrangement (Eiszele 1998; Peters and den Dulk 2003; George et al. 2021). Productivity and job satisfaction were found to be higher among call centre employees in China after they were allowed to work from their homes for nine months (Bloom 2014). In a study conducted on Indonesian teachers, Purwanto et al. (2020) reported that the respondents felt WFH curtailed work motivation due to electricity and internet costs, data security problems, and technological complications. Evidently, the experiences in WFH are profession-specific and cannot be generalised. With that context, this study attempted to explore the experiences of ecologists, seeking to understand their responses to the notion of WFH during the first wave of the COVID-19 pandemic in 2020. Specifically, the paper will adopt a mixed method to analyse the differences in WFH perceptions of ecologists through the organismic variables of age groups and professional positions. The findings of this paper can help improve the manage-

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ment of research institutions, in particular, ecology institutions, on a global scale such that the recurrence of similar pandemics can be dealt with more empathy towards the research employees.

Review of Literature

The temporal scale of this literature review is restricted to the recent works on WFH during the past two years, primarily focusing on Indian WFH situations. The span of 2020-2022 provided different nuances to the idea of WFH through macro and micro-scales. In the United States, WFH was more widespread among highly educated, high-income, white workers (Bick et al. 2020) while Dubey and Tripathi (2020) argued that the WFH experience had a positive perception worldwide. Another study conducted during the first wave of the COVID-19 pandemic implied that thirty-seven percent of jobs in the United States can plausibly be performed at home (Dingel and Nieman 2020). In the same study, Dingel and Nieman (2020) found that lower-income nations (of the 85 nations studied) have lesser professional options to be executed from homes. Employees reported increased workplace toxicity in the WFH set-up like incivility, belligerent behaviour, and poor interpersonal conduct (Goswami 2022).

The Indian government announced a national lockdown from midnight on 24 March 2020 to control the community transmission of the Coronavirus (Navinya et al. 2020). A WFH policy was imposed in light of the closure of educational (and/or research) institutes (Viner et al. 2020) and offices. Before the pandemic, the Indian society was unaware of the WFH concept except for call centres, freelancing, and IT professionals (Bloom et al. 2015; Srivastava et al. 2015). During the pandemic, in the Indian context, Chauhan (2021) observed that the WFH has created time poverty for the employed women and exacerbated the state of homemakers through a surge in unpaid work. In a similar line, working parents realised the difficulty to balance the work and the need of their children while WFH endangers the child-parent relationship (Attavar 2021; Hazarika and Das 2021). A study on corporate sector employees and university students in India revealed that the WFH policy negatively affected the majority's well-being (Majumdar et al. 2020). Sanchez et al. (2021) observed that India has fewer jobs that can be performed at home with a

lack of Internet access as a constant constraint. The sectors of agriculture, tourism, hospitality and construction have reported serious economic losses during the pandemic (Debata et al. 2020). Mann and Chitranshi (2021) traced the incremental decrease in the employment rate across the nation owing to various reasons. Exploring the WFH perceptions of 50 employees across different sectors, Neog and Goswami (2021) found mixed responses where a section of them appreciated the WFH set-up while the other section found it onerous to meet the professional commitments. Lowered job performance(s) in the WFH situation, stemming from family distraction and occupational discomfort, was found to significantly reduce life satisfaction among public and private professionals based in Delhi and the NCR region of India (Kumar et al. 2021). Kurian and Thomas (2022) demonstrated that the perceived stress among Indian IT professionals while working from home is associated with gender, marital status, and parental status. Sentiment analysis of Indians concerning the lockdown reflected employment-related sadness among the majority of the respondents (Barkur and Vibha 2020). Majumdar et al. (2020) suggested the WFH policy threatened the urban corporate professionals through social isolation, technology dependence, and muddled work schedule.

Rationale of the Study

This paper is theoretically based on the principle that an individual's well-being is positively related to satisfaction in work life (Shamir and Salomon 1985). These qualitative attributes are influenced by multiple factors like payoffs or rewards, perceived supervision quality, working conditions, and individual determinants that include designation and seniority, age group, marital status, and professional experience (Mosadeghrad et al. 2008). It is also observed that employee engagement is highly related to their professional commitment, satisfaction, and attachment to the workplace (Bin 2015). In a related study, Lin (2007) found that job satisfaction comes from professional autonomy and relationship with colleagues. Work-life satisfaction is not only rewarding for the individual concerned, but it also improves the quality of professional outputs and services (Hurley and Estelami 2007; Luthans and Peterson 2002; Schlesinger and Zornitsky 1991). In the last decade, there have been

many studies that documented the importance of effective communication with employees and its benefits. The commonality in all these studies is the fact that employees feel their identity is more valued when given the scope to communicate (Khan et al. 2020). Employees' ability to communicate also increases their engagement in the workplace and affects the culture therein (Karanges et al. 2015). It is, hence, a prerequisite that employees are provided with opportunities to be vocal about their experiences to sustain a healthy work-life.

Limited as is the scope of WFH in the Indian setting, the unprecedented arrival of this pandemic made its enforcement rather than a choice. This, therefore, raises the question, "Are all professional sectors adaptable to WFH?" Though certain professions are well adapted to the concept of WFH, research as a profession is always associated with the usage of laboratories and experiments. In the regime of research, ecological researches are highly dependent on field-based data collection, conducting surveys with the communities, and interaction in the wild among many other outdoor activities. Ecologists belong to a unique profession that is largely interdisciplinary and outdoor-based. Their research is not amenable to closed-door laboratory-based inquiries. This reliance on open-air research approaches was in contradiction to the normative of WFH during the pandemic.

That being the rationale, this paper provides a platform for the ecologists to vent their perceptions about WFH during the pandemic's first wave. This empirical study, based on mixed methods, considers a *terra incognita* domain of study, that is, ergonomics of WFH through ecologists' experiences. The investigators assume this sudden transition to WFH might have caused professional and personal discomfort to the employees, particularly for the ecological researchers whose field of study is the environment itself. In the ambit of this study, some terms need to be defined like productivity and working hours. Both these subjective terms were measured through the perception of the respondents and the authors have used perceived productivity and perceived working hours in the entire paper. That being said, this is one of the merits of this paper where the results are analysed from the lens of respondents' experiences (with no external bias). Besides a novel addition to the literature on ergonomics of working from home, this paper will serve as a reflection of the ecologists'

community such that their voices are heard, to inform the organisation for being more empathetic towards the employees. Moreover, this unique cohort of professionals that are ecologists, sharing their experiences of WFH will help research organisations worldwide to better their professional milieu for repetition of such pandemics. This pandemic opened the market for WFH ecologist jobs, and therefore, the insights of this paper can up-skill the industrial and corporate sectors to amend their services for hiring WFH ecologists.

Objectives of the Study

The present study attempted to address the following objectives:

1. Investigation of ecologists' experiences on the feasibility of WFH policy during the first wave of the COVID-19 outbreak.
2. Co-relationship between the perceived increase in productivity and the perceived increase in working hours during WFH.
3. Qualitative analysis of the benefits and limitations of WFH policy through the perceptions of ecologists.

METHODOLOGY

Sample and Sampling Technique

The study was conducted among researchers from an ecology and environment-based research organisation with their main office located in Bengaluru, India. It is a global non-profit organisation that engages research fellows and scholars in interdisciplinary research of ecological and social sciences. Data was collected from all its sub-offices including the head office in Bengaluru (Karnataka), regional office (eastern Himalayas) in Gangtok (Sikkim), and liaison and development office in New Delhi (New Delhi). The sample population of ecologists included three groups of respondents, that is, research fellows (alternatively, faculties), research scholars (alternatively, doctoral students), and research associates (including Junior Research Associates (JRAs), Senior Research Associates (SRAs), and Research Assistants (RAs)). Obtaining the informed consent of the respondents, it was ensured each of these groups consisted of a minimum of 15 individuals.

The respondents were chosen through purposive and volunteer sampling from the entire staff of the institution (Etikan et al. 2016). Given that the number of respondents will differ in every group, the data analysis was done through percentages to avoid statistical errors. The study was carried out through an online Google Form that was made available to the respondents from 16 April 2020 to 1 May 2020. The study period was after 3 weeks of the national lockdown announcement in India, which provided the respondents with the requisite experience of WFH. The Google Form bore an option of consent for participation with options of anonymity.

Research Design

The research was designed through mixed methods and the questions were drafted to understand the feasibility, flexibility, technicality, variability, utility, profitability, and difficulty of WFH from the experiences of ecologists. The study was outlined through a simple scheme of the EAR, wherein,

E = Elicit the experiences of the participants towards WFH (data collection)

A = Assessment of WFH experiences through their responses (analysis)

R = Remediation of the problems through institutional interference (implications)

The present cross-sectional study was designed through descriptive (Hoonakker et al. 2013) and exploratory (Wells et al. 2015) surveys. There were three sections to the questionnaire. The first section gathered the demographic profile (age, gender, marital status, and professional position) of the respondents, the second section included questions for quantitative data collection relating to working hours, productivity, and other related facets of WFH, while the third section was meant for qualitative data collection, with questions relating to the advantages and disadvantages of WFH through the experiences of ecologists.

The collection of demographic information was to ensure that the research participant(s) were a representative sample of the target population and aid statistical analysis of the responses. The survey can be divided into three sections with Likert items, close-ended, and open-ended questions. A Likert item is a specific statement that rates respondents' attitude/opinion/experience. Likert items

collect ordinal data and are not integrated into a composite scale. The investigators used Likert items for their simple structure and ability to predict the respondents' behaviour. A close-ended question provides the respondents with a fixed number of options from which they choose their responses. It is essentially made up of a question stem and a set of closely related response alternatives. For this research, the investigators used the close-ended questions to derive measurable (dichotomous and polychotomous) data to analyse associations among the responses. Open-ended questions are effective tools to stimulate responses that are otherwise neglected in the close-ended approach. In the scope of this research, the investigators used open-ended questions to qualitatively analyse the challenges and benefits of WFH from the ecologists' perspectives.

Format of the Research Tools

The given survey-based study involved three research tools, that is, 5-point Likert items, close-ended and open-ended questions. In this study, the format was a 5-point Likert item, the conventional type with one statement/question accompanied by two positive and two negative response options and a neutral option in the middle. The close-ended questions carried two and three options depending on the intent of the question. The open-ended questions were structured in one sentence followed by a considerable gap for writing the responses.

The statements and questions (collectively called items) in the tools were validated by relevant experts. The item validity was determined through the face and content validity. Rating of the face validity involved scoring the clarity, precision, and understanding of the items (Trochim 2006). 10 social scientists scored 1 or 0 on each of these aspects individually for the items. The inter-agreement among the raters was calculated through Fleiss' kappa index (Osorio and Jaimes 2019). The content validity was assessed through the classes, that is, essential, useful but not essential, not necessary, by the raters. 15 ecologists ascribed a particular class to each item based on their judgment of the content and the Content Validity Ratio (CVR) was calculated through the Lawshe index (González et al. 2016), which is,

$$CVR = \frac{n_e - N/2}{N/2}$$

Wherein,

n_e = number of experts who marked the “essential” category

N = total number of experts

Any item with a CVR below 0.60 ($n=15$) was not be considered for the study (Ayre and Scally 2014) and Content Validity Index (CVI) was measured by averaging the CVRs of the accepted statements. In both the validity tests, the raters did not belong to the study organisation.

Average values of rating on clarity, precision, and understanding entailing the face validity were calculated to be 0.78, 0.72 and 0.83, respectively. The Fleiss’ kappa index of inter-rater agreement was 0.531 (clarity), 0.498 (precision), and 0.547 (understanding). The acceptable range of Fleiss’ kappa index lies between 0.41 and 0.60 (Patacsil et al. 2015), and it can be deduced that the 10 raters agree with each other on the face validity of the items in this study. For content validity, CVI was calculated to be 0.91 (much in the higher end) and no item had a CVR less than 0.60. Therefore, all the items were used in the study.

Data Analysis

The responses from the survey were analysed through PAST 4.0 software (with $\alpha=0.05$ taken as statistically significant) after converting the responses into percentages. The quantitative analysis included formulating a hypothesis within the brackets of the objectives. Apart from general analyses of responses, Fisher’s exact tests were done to check if there are significant associations between the responses of items for both professional positions and age groups. Fisher’s exact test examines the null hypothesis of independence through hypergeometric distribution when there are response values lesser than 5. In this study, more than twenty percent of response values were less than 5. Furthermore, paired t-tests were used to check the relationship between the perceived increase in productivity and the perceived increase in working hours. In the qualitative analysis, ecologists reported the benefits and limitations of WFH. As a practical implication of the study, the findings were communicated to the concerned institu-

tion such that administrative interventions can better the then situation.

RESULTS

Demographic Statistics of the Respondents

The total number of participants in the study was 52, wherein 26 respondents belonged to the age group of 20-30 years, 14 respondents belonged to the age group of 31-40 years, 8 respondents belonged to the age group of 41-50 years, and 4 respondents belonged to the age group of 51-60 years. Professionally, 16 respondents were research fellows, 19 respondents were research scholars and 17 respondents were research associates (Table 1). The percentage shares of the respondents are stated in the parentheses against the numbers in Table 1. Professional positions and age groups were related to each other, and the research fellows were mostly in the higher age groups while the research scholars and young research associates were mostly in the lower age groups.

Table 1: Distribution of respondents through the organismic (categorical) variables

<i>Professional positions</i>	<i>Number of respondents</i>	<i>Age groups (in years)</i>	<i>Number of respondents</i>
Research Fellows	16 (30.8%)	20-30	26 (50%)
Research Scholars	19 (36.5%)	31-40	14 (26.9%)
Research Associates	17 (32.2%)	41-50	8 (15.4%)
		51-60	4 (7.7%)
Total	52		52

Descriptive Statistics of the Ecologists’ Perceived Feasibility of WFH Policy

The feasibility of WFH is largely dependent on the nature of work and infrastructural conveniences. Given that ecologists spend maximum time in outdoor fields followed by laboratory-based analyses, the researchers examined the feasibility of WFH through their experiences. 36 respondents (13 research fellows, 10 research scholars, and 13 research associates) found the WFH policy flexible for their work type. It can be assumed that they could access necessary infrastructural facilities for their nature of work. 15 respondents perceived WFH as flexible to some extent (3 research fellows,

8 research scholars, and 4 research associates). 1 research scholar found WFH rigid concerning the work type (Table 2). Upon investigating the 16 responses that said 'somewhat flexible' and 'not flexible', it was found that 7 respondents found the lack of access to the herbarium room, laboratory, and library as reasons for their inflexibility. Other inflexibilities were due to restrictions to traveling sites (2), lack of Internet facilities (2), and lack of a professional (work) environment (5). The numbers in the parentheses account for the number of respondents. 18 respondents belonging to the age group of 21-30 years perceived WFH as flexible followed by 8 respondents from the age group of 31-40 years. One implication derived from this observation can be the youth's ability to adapt to "new" easily as compared to their senior counterparts. Youth are resilient to technological evolution and thus, WFH being one such was found flexible by the majority of them. In this study, even the senior respondents nodded 'yes' to perceived flexibility in higher numbers as compared to the 'somewhat' and 'no' responses (Table 3). The reasons senior ecologists felt a lack (or somewhat lack) of flexibility while working from home were mostly due to the absence of a suitable working environment.

Descriptive Statistics of the Perceived Productivity and Perceived Working Hours during WFH

In this section, the ecologists' perceptions regarding their working hours and productivity were examined through the lens of professional positions and age groups. The initial section dealt with a general analysis followed by paired t-tests to

comment on the relationship between the perceived increase in productivity and perceived increase in working hours (for both organismic variables). The final section inquired about the presence of significant associations between the responses of a given item through the organismic variables using Fisher's exact test, as this would reveal patterns of (any) associations in the responses within the variables.

Ecologists' Perceptions of Working Hours during WFH

For the tabular representation, the time slabs per day were divided as 2-6 hours, 6-10 hours, and more than 10 hours. The ecologists marked the class based on their WFH experiences. Table 2 offered an overview of their responses, that is, in the slab of 2-6 hours, maximum responses (16) came from the research scholars followed by (9) research associates and (7) research fellows. In the slab of 6-10 hours, the highest responses (8) were obtained from research associates followed by (5) research fellows and (2) research scholars. It can be assumed that the professional commitments rendered the professionally senior individuals to work more than their juniors. Additionally, research associates ought to have more engagements for their multiple project deliverables, as a single associate is often occupied with 3-4 projects at a given time. A similar argument applies to the research fellows who have to supervise multiple students and that subsequently, increases their working hours through meetings and presentations. Working for more than 10 hours in a day was reported by 4 research fellows and 1 research scholar. The contrast in the response frequency is un-

Table 2: Ecologists' experiences on different parameters of WFH through their professional positions during the first wave of the COVID-19 pandemic

Professional positions	WFH perceived flexibility			WFH perceived productivity			WFH perceived working hours (per day)		
	Yes	Some-what	No	Increased	No change	Decreased	2-6 hours	6-10 hours	> 10 hours
Research	13	3	-	7	4	5	7	5	4
Fellows	(25%)	(5.8%)	-	(13.5%)	(7.7%)	(9.6%)	(13.5%)	(9.6%)	(7.7%)
Research	10	8	1	2	1	16	16	2	1
Scholars	(19.2%)	(15.4%)	(1.9%)	(3.8%)	(1.9%)	(30.8%)	(30.8%)	(3.8%)	(1.9%)
Research	13	4	-	4	7	6	9	8	-
Associates	(25%)	(7.7%)	-	(7.7%)	(13.5%)	(11.5%)	(17.3%)	(15.4%)	-

derstood, owing to the differences in the professional responsibilities.

Investigating the working hours through the age groups, it was noticed that all the ecologists who worked beyond 10 hours a day belonged to the age group of 31 years and above. This resonated with the findings from Table 1, that is, the respondents in the higher end of age groups are representatives of family men and women. They have spouses, aging parents, or children with domestic responsibilities, which made them invest more time at work. In the slab of 2-6 hours, the highest responses (20) were received from the age group of 21-30 years followed by 31-40 years (8). In the slab of 6-10 hours, the proportion of respondents in the age group of 21-30 years decreased markedly as compared to the number of responses in the slab of 2-6 hours. It can be inferred that younger ecologists needed to work less both due to lesser professional and family-related commitments. Table 3 sketched the responses for each time slab from all the age groups.

The researchers have not surveyed whether the ecologists were following the usual 8 hours of regular work duration at the organisation (9 am- 5 pm) or not, nor did that lie in the scope of this study.

Ecologists' Perceptions of Productivity during WFH

Working hours inform the time duration a person is working, but there are no details on productivity. During this study, respondents were surveyed for their 'perceived' productivity through Likert items and close-ended questions. The results were compared within the organismic variables. The aspect of productivity was considered significant in the given study since the social anxiety due to the coronavirus pandemic crippled everyone's personal and professional life. In this study, there was no index set for productivity, and respondents marked the options based on their perceptions.

The analysis on productivity reflected that half of the respondents (27) believed their productivity decreased during WFH, including 5 research fellows, 16 research scholars, and 6 research associates. It can be inferred that revocation of access to outdoor field trips and restricted infrastructural facilities at home caused them to feel a decrease in

their productivity. On top of that, in today's context, the research work is collaborative and seeks collective effort. WFH did not allow in-person meetings, therefore, decreasing perceived productivity. Time management and regulating online discussions while working from home took time to get normalised. 13 respondents perceived that their productivity has increased, including 7 research fellows, 2 research scholars, and 4 research associates (Table 2). Distinctions in the response frequencies can be attributed to the ability of independent working. For example, maximum research scholars experienced a decrease in productivity given they need to meet their supervisors and thesis committee members for regular research updates. This reliance on meetings caused them to feel decreases in productivity given WFH curbed this situation. At times, scholars waited for multiple weeks to get in touch with their supervisors and thesis committee members for mutual dissociation in time and technical facets. On the contrary, research fellows and research associates do not need as much guidance and they, in their way, kept up the productivity while WFH. The perceived increases in productivity can be ascribed to relaxed working environments at home and saving time through limited or no traveling.

While assessing productivity through the age groups, it was found that the highest responses (16) for the perceived decrease in productivity were received from respondents in the age group of 21-30 years. It was followed by 8 respondents in the age group of 31-40 years and 2 respondents in the age group of 41-50 years (Table 3). These are cognate to the findings of Table 2. The young respondents were mostly research scholars and the absence of supervision made them feel less productive. In normal times, these young scholars sit together to peer-critique each other's ideas and progress which was not plausible during WFH, and this also negatively impacted their perceived productivity. No change in the perceived productivity was reported by 5 respondents in the age group of 21-30 years, 3 respondents in the age group of 31-40 years, 2 respondents each in the age groups of 41-50 and 51-60 years, respectively. It can be opined that these ecologists were mostly engaged with self-dependent and theoretical work like drafting thesis chapters and manuscripts that are activities that can be performed without much human and infrastructural interaction.

Table 3: Ecologists' experiences on different parameters of WFH through their age groups during the first wave of the COVID-19 pandemic

Age groups (in years)	WFH perceived flexibility			WFH perceived productivity			WFH perceived working hours (per day)		
	Yes	Some-what	No	Increased	No change	Decreased	2-6 hours	6-10 hours	> 10 hours
1-30	18 (34.6%)	7 (13.5%)	1 (1.9%)	5 (9.6%)	5 (9.6%)	16 (30.8%)	20 (38.5%)	6 (11.5%)	0
31-40	8 (15.4%)	6 (11.5%)	0	3 (5.8%)	3 (5.8%)	8 (15.4%)	8 (15.4%)	5 (9.6%)	1 (1.9%)
41-50	7 (13.5%)	1 (1.9%)	0	4 (7.7%)	2 (3.9%)	2 (3.9%)	2 (3.9%)	3 (5.8%)	3 (5.8%)
51-60	3 (5.8%)	1 (1.9%)	0	1 (1.9%)	2 (3.9%)	1 (1.9%)	2 (3.9%)	1 (1.9%)	1 (1.9%)

Relationship between Ecologists' Perceived Working Hours and Perceived Productivity during WFH

Studies on relationships between working hours and productivity (Collewet and Sauermann 2017) concluded differently based on the sample population and nature of work. Contextual in its meaning, this study considered perceived productivity and perceived working hours through ecologists. The null and alternate hypothesis was formulated as follows.

H₀: There is no significant relationship between the perceived increase in working hours and the perceived increase in productivity.

H₁: There is a significant relationship between the perceived increase in working hours and the perceived increase in productivity.

The researchers considered the responses for more than 8 working hours/day as a perceived in-

crease in working hours given that the (usual) official working hours are 8 hours/day. These responses were compared with the responses under a perceived increase in productivity. The paired t-tests were carried out for both the organismic variables, and results are tabulated in Table 4. The null hypothesis was failed to reject for both the organismic variables (p > 0.05) and it can be concluded that there existed no significant relationship between the perceived increase in productivity and the perceived increase in working hours for the ecologists at WFH. Based on the empirical findings, it can be implied that working for more hours does not warrant an increase in productivity for this cohort of professionals. For the ecologists and researchers in general, there is a mental investment in their genre of work, longer working hours at WFH lead to fatigue and exertion, thereby marginalising productivity. Moreover, this study was

Table 4: Relationship between increased working hours and productivity during WFH for different professional positions and age groups

Professional positions (comprising all the categories)						
Parameters	Responses (in%)	Mean	Mean difference	95% confidence level	t-value	p-value
Perceived increase in working hours	23.05	8.333	0.65	-4.879, 6.179	0.506	0.663
Perceived increase in productivity	25	7.683				
Age groups (comprising all the categories)						
Perceived increase in working hours	23.07	6.25	0.483	-7.174, 8.139	0.201	0.854
Perceived increase in productivity	25	5.768				

conducted during the first wave of the pandemic, wherein the ecologists who depend on outdoor field-based research practices found it taxing to adjust to this new change of indoor professional life and perceived working more but not necessarily yielding more productivity.

Associations between the Ecologists' Perceptions of WFH Parameters

Fisher's exact test was performed to study any significant (non-random) associations between the responses of the ecologists. The null and alternate hypothesis was designed for the two organismic variables as follows.

H_0 : There are no significant associations among the ecologists' perceptions of WFH parameters (for both professional positions and age groups).

H_1 : There are significant associations between the ecologists' perceptions of WFH parameters (for both professional positions and age groups).

The p-values obtained through the Fisher's exact test for every question for both the organismic variables were reported in Table 5.

Within the professional positions, the null hypothesis was rejected for questions 2 and 3 and failed to reject for question 1, indicating significant associations within the perceptions of research fellows, research scholars, and research associates for WFH productivity and working hours. Within the age groups, the null hypothesis was failed to reject for questions 1 and 2 and rejected for question 3, suggesting a significant association between the perceptions of ecologists from all age groups about WFH working hours.

Ecologists' Perceptions of WFH impacting their Quality of Life

Quality of life is largely influenced by professional experiences and contentment, which is in

turn regulated by multiple factors like work-life balance, career prospects, stress level at work to name a few. Quality of life is quite an intangible unit that is shaped through personal experiences as well, like life satisfaction, affection (feelings and emotional states), and eudaemonics. Defining the scope of this study, quality of life was determined through respondents' perceptions. Here, the ecologists, based on their perceptions and acuties on life's attributes, responded to how WFH policy was impacting their quality of life. A 5-point Likert item was used for this purpose. In the range of disagreement, maximum responses (7) were obtained from ecologists in the age group of 41-50 years while in the range of agreement, maximum responses (9) were obtained from the age group of 21-30 years. One interpretation of this dissimilarity is younger ecologists were more affected by WFH and that could be because of their professional stakes. Most of the younger ecologists were research scholars enrolled for the doctoral degree. Doctoral programs are stressful and isolating under the best of circumstances. This tensile state in their professional lives was aggravated due to the sudden transition to WFH affecting their perceived quality of life. 13 ecologists in the age group of 21-30 years (Table 6) responded neutrally to this item followed by 4 ecologists in the age group of 31-40 years. It can be inferred that these respondents were in a state of confusion and could not decide if WFH was impacting their perceived quality of life or not. Since the study was conducted during the first wave of the pandemic, it is understood that ecologists were trying to chalk out the situation and could not espouse WFH's effects on their perceived quality of life. No one in the age group of 51-60 years agreed to WFH impacting their perceived quality of life, and it is likely that they are more comfortable working in the home environment due to their advancing age.

Table 5: p-values from Fisher's exact tests to check for associations within ecologists' perceptions concerning WFH parameters during the first wave of the COVID-19 pandemic

<i>"For professional positions"</i>	<i>p-values from Fisher's exact test</i>	<i>"For age groups (in years)"</i>	<i>p-values from Fisher's exact test</i>
Question 1: WFH flexibility	0.266	Question 1: WFH flexibility	0.722
Question 2: WFH productivity	0.005*	Question 2: WFH productivity	0.391
Question 3: WFH working hours	0.012*	Question 3: WFH working hours	0.021*

* p-values equal to or less than 0.05 are statistically significant p-values.

Qualitative Analysis of Ecologists' Perceived Benefits and Limitations of WFH

From the perspective of ecologists, the benefits and limitations of the WFH policy were inspected with the help of open-ended questionnaires. WFH was perceived to be advantageous in dipping travel and fuel expenses, saving time, increasing work efficiency, spending more time with family, a relaxed working environment, and flexible working hours. Daily commuting to the workplace required spending money on public transport or personal cars but with WFH, this expenditure got saved. In a similar vein, it saved time due to no waiting in the traffic jams and signals. WFH was perceived as positive, as it allowed the ecologists to devote more time to the family. Ecologists also travelled back to their natives and WFH allowed them to be close to family. There was an increase in the perceived work efficiency, which can be accredited to saving time through travels. Also, when young ecologists (bachelors) did WFH from their native locations, they could care less about household and kitchen chores since family members (mostly, mothers) were around taking care of that. Similarly, a relaxed working environment was a perceived benefit of WFH for homely ambiance, flexible working arrangements, and saving time through

no or fewer travels. The typical 9 a.m. to 5 p.m. work schedule was much more flexible now, and ecologists could choose their working schedule. Thus, a perceived benefit of WFH was offering a greater latitude in choosing particular hours of work (Table 7).

Perceived limitations of WFH as marked by ecologists were lack of direct contact with colleagues, lack of access to resources/internet connectivity, difficulty in interaction with students/peers through online platforms, no access to fields and laboratory, and unregulated time management in absence of proper work environment. Ecology research seek interdisciplinary approaches where multiple discipline experts consociate to develop and execute a project. WFH disallowed such in-person collaborations and therefore, ecologists pointed to the lack of direct contact with colleagues as a perceived limitation of WFH. Lack of access to resources and technical limitations included low Wi-Fi bandwidths at homes/tenanted houses as compared to institutional Wi-Fi. Ecologists often engage in big data analytics, and personal laptops could not support the heavy software required for big data analysis (like ecological niche modelling and acoustics). There is limited access to archival and journal websites in the absence of institutional login portals (Wi-Fi). All of these factors were

Table 6: Ecologists' perceptions (through their age groups) of WFH affecting their quality of life during the first wave of the COVID-19 outbreak

Age groups	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
21-30	2 (3.8%)	7 (13.5%)	13 (25%)	4 (7.7%)	-
31-40	-	4 (7.7%)	7 (13.5%)	1 (1.9%)	2 (3.8%)
41-50	-	1 (1.9%)	-	3 (5.8%)	4 (7.7%)
51-60	-	-	3 (5.8%)	-	1 (1.9%)

Table 7: Ecologists' perceptions about benefits and limitations of WFH during the first wave of the COVID-19 pandemic

Perceived benefits	No. of respondents	Perceived limitations	No. of respondents
Reduction in travel and fuel expenses	17 (32.7%)	Lack of direct contact with colleagues	14 (26.92%)
Time-saving	9 (17.3%)	Lack of access to resources/internet connectivity	11 (21.15%)
Increase in perceived work efficiency	4 (7.7%)	Difficulty in interaction with students/peers through online platforms	10 (19.23%)
More time with family	8 (15.4%)	No access to fields and laboratory	6 (11.54%)
Relaxed working environment	12 (23.1%)	Insufficient time management due to absence of work environment	10 (19.23%)
Flexible working hours	1 (1.9%)	Others	2 (3.85%)
Others	1 (1.9%)		

reasons behind the perceived limitation of lack of access to resources/internet connectivity. Fellows perceived difficulty in interacting with students over the online platforms and the same issue was reported for peer interaction. The online transition was unanticipated and with technical deterrents, it is understood how that can be perceived as a WFH limitation. Inaccessibility to fields for data collection and laboratory for data analysis was a self-explanatory perceived limitation of WFH. Ecologists are, at times, engaged in jobs that required a highly technical and remote location. The perceived limitation of insufficient time management due to the absence of a work environment reflects the same. Drafting manuscripts and analysing statistical data are few of many such activities that cannot afford home-life distractions.

Technical Facilitation for WFH: A Beginning Report to Future Implications

The role of the organisation in promoting WFH was studied through facilities provided to the ecologists. 30 respondents were provided with institutional laptops/PCs while 22 respondents had their laptops/PCs to work during WFH. The institution provided 12 respondents with Internet facilities that stayed in the research scholars' hostel while 40 respondents used their Internet services through their homes/tenanted houses.

DISCUSSION

The elements of contingency in the nature of ecologist's profession in a situation of social crisis would make this study an intriguing inclusion in ergonomics research. WFH emerged as a remedy to contain the spread of the pandemic, thereby defining the conventional features of professional lives. Not all jobs can normalise remote working and more when they are ecological researchers who study practical, real-world and spatially bigger problems of the ecosystem. The findings from this study can be employed in Indian and international research organisations to give a facelift to this unique cohort of researchers. Besides that, this study also encourages similar studies in other organisations given collection and acknowledgment of employees' experiences have proved to be beneficial for better functioning of the organisational workplace (Silverman et al. 2005).

To begin with, studies on WFH parameters and experiences are highly circumstantial, marking the importance of this study. Redmond and McGuinness (2020) aptly pointed out that the practice of WFH is conceivable in highly paid jobs and sectors of education (and research), computer-based industries, and finances. In that vein, this paper is an empirical approach to assessing the WFH experiences from an ecologist's standpoint. The investigators have invariably assessed the experiences of WFH through different professional positions and age groups of the ecologists. Findings reported that 69.23 percent of ecologists perceived that their work type is flexible enough to be performed from home, as ecological research or any research per se is a high-tech profession and digital technologies promote more resilience to such professions during unforeseen shocks, thereby catering better feasibility (Bai et al. 2021). Dewi and Adiarsi (2020) observed a similar line when the employees at an oil and gas company in Indonesia reacted positively to the feasibility of working from home. WFH feasibility is positively associated with income (Bonacini et al. 2021), and ecologists' salaries were unaffected by WFH due to the pandemic and that justified the higher positive responses for WFH feasibility. In the present study, perceived productivity has gotten higher responses for 'decrease' during WFH. Wu and Chen (2020) studied differences in productivity between regular work and WFH of 13,000 US-based employees from 7 different occupational categories in May 2020 and found researchers showing a decline in productivity by 0.38 ± 0.97 while working from home. Within the responses on the decrease in perceived productivity, the majority were the younger ecologists (research scholars and respondents in the age group of 21-30 years). A cross-sectional study during the first two months of COVID 19 occurrence (March-May 2020) in Austria supported that perceived productivity decreased in 30.2 percent of the working population and that the WFH experiences were unequally distributed across young and senior professionals (Weitzer et al. 2021). Etheridge et al. (2020) used the UK Household Longitudinal Survey (UKHLS) to assess the self-reported productivity of UK-based WFH workers after the end of the first lockdown. The authors reported lesser deliverables, technical limitations, and non-ergonomic settings at home as the primary reasons for the decline in self-reported produc-

tivity of employees. More senior ecologists informed increase in perceived productivity (research fellows and research associates in age groups of 31-40 and 41-50 years), and this reflects a good future of remote working in the Indian scenario, as it transcends the social stereotype that older people are technologically debilitated. Perceived working hours was another WFH parameter in this study and it was observed that the younger ecologists (research scholars and respondents in the age group of 21-30 years) worked for lesser hours as compared to the other groups. Li et al. (2020) believed that generational age groups would differ in their WFH perceptions. In a quantitative study on WFH experiences through Twitter data during April 5 to 26, 2020, it was found that older people show more positive sentiments toward WFH and worked for more hours than the other age groups (Xiong et al. 2021). Beck and Hensher (2021) surveyed the perceived working duration of 956 Australian respondents through three age groups of 18-34, 35-54, 55 or older, in the span of August-October 2020. The older respondents in this study reported significantly higher average working duration at WFH compared to the younger cohorts, which is similar to the present study. Deciphering the relationship between working hours and productivity is not facile because of unobservable characteristics of job types and external biases (Collewet and Sauer mann 2017). No significant relationship was traced between ecologists' perceived increase in working hours and perceived increase in productivity in WFH during the first wave of the COVID-19 pandemic. In a recent study on WFH productivity of 10,000 skilled professionals at an IT company, Gibbs et al. (2021) deduced that increase in working hours is causing a decrease in productivity.

In this study, around fifty percent of ecologists mentioned that they were provided with institutional computers and twenty-three percent of ecologists could access institutional Internet connectivity during the first wave of the pandemic. Mukherjee and Narang (2022) conducted a study with 96 respondents who were actively involved in WFH since the first lockdown in India, and the authors reported fifty-one percent of respondents acknowledged support from their organisation(s) for Internet connectivity. In the perceived benefits of WFH, the highest responses were received for reduced expenses of travel and fuel and a relaxed

working environment. Fukumura et al. (2021) used a questionnaire with 30 Likert-type and categorical response questions to explore the benefits of WFH for 988 respondents. Most replies of WFH benefits were framed through two themes, namely, time use and considerations of working in the home space. In their qualitative analysis, a respondent viewed 'simply being away from the typical office environment' as a perceived benefit of WFH. Reduction in transportation-related factors (costs and time) was stated as a beneficial factor of WFH in a comparative study of WFH influences on employees' productivity (Thorstensson 2020). WFH offered flexibility due to no commuting to the workplace, providing the comfort of homes, and the ability to enjoy healthier lifestyles (Daud et al. 2021). Ecologists also perceived these factors as beneficial in the WFH settings. WFH was perceived beneficial, as it allowed the ecologists to spend more time with family, and similar observations were reported by Tudy (2021) where family time was one of the most significant benefits conveyed by 11 Filipino professionals. Ecologists' perceived limitations of WFH included the inability to build rapport with colleagues, technical inhibitions, restrictions in field visits, research fellows' inability to teach students and research scholars' inability to get requisite supervision, procrastination due to home-life distractions or personal work taking precedence over official work and social isolation. In a study on 42 employees working from home, the absence of eye contact with students was reported by the majority of teachers (Mathias and Kumar 2020). Hayes et al. (2020) tabulated WFH challenges of 326 respondents across different genders, job types, and age groups, and 21.36 percent of respondents had trouble conversing with team/colleagues, 19.2 percent respondents had difficulty with technology, 18.42 percent respondents failed to manage time and 8.98 percent respondents struggled to receive clear communication from supervisors/managers. In a similar line, lack of work environment and fewer social connections were listed as perceived WFH limitations by software engineers at Microsoft, USA (Ford et al. 2021). Inadequate tools such as missing the required equipment and data/document were cited as one of the WFH disadvantages in a survey of 5748 knowledge workers, conducted during the early stages of lockdown (Ipsen et al. 2021). From an ecologists' purview, at times, there are elements of confi-

dentiality in research data that needs careful handling and WFH might pose problems for such data sharing. WFH breached privacy as per 46.58 percent of respondents from IT organisations in India (Phadnis et al. 2021). Social disquietude arising from a pandemic takes a huge toll on mental health and working from home in such a situation can be enervating, and this is beyond the scope of this study.

CONCLUSION

Justifying the nature of this study, the current empirical study is cohesive, exploratory, descriptive, and cross-sectional. It is cohesive for its reliance on one subject, that is, ecologists' experiences on WFH, and interpreting the evidence to support that subject. It is exploratory, as it explored along the lines of a relatively new ergonomic regime of remote working in the ecologist's profession in India. Given the study discerned two selected WFH parameters at one specific point in time, it can be tagged as descriptive and cross-sectional. This study was a discourse at great length on the experiences of WFH building upon the insights of ecologists, an unheard cohort of professionals. The findings led to informative narratives drawing from its mixed methods outlook and revealed the scale at which the ecologists' experiences lie to evolve WFH for the days to come. On an overall scale, WFH as modus operandi of professional lives has been appreciated by ecologists. The present study concluded that perceptions of WFH feasibility, productivity, and working hours vary across the age groups and professional positions and it is essential to address the problems at such levels. The absence of any significant relationship between the perceived increase in productivity and the perceived increase in working hours implies that one need not physically work for more time to be productive. The dichotomy concerning the perceived benefits and limitations is influenced by many factors (that for some are a benefit, while for others a limitation). Given the premise of this study, there are future opportunities for research like a comparative assessment of during and post-WFH experiences of ecologists, examining the changing landscape of the workforce of ecologists at the global scale (due to the pandemic), and the future of ecological work in the pandemic era.

RECOMMENDATIONS

WFH was an alien concept in the ecologists' community, more in the context of India. It is, therefore, necessary that ecological research institutions are more empathetic towards their employees and students. One of the primary recommendations will be to conduct regular surveys for providing a space for the ecologists to convey their challenges and suggestive measures to improve the WFH dynamics. It is also proposed that the research fellows (supervisors) assist the research scholars (students) to develop their core self-evaluation. The supervisors can give feedback to enhance the students' confidence and self-efficacy while working from home. Additionally, WFH perceptions are unique to an individual based on their professional position and age group, and thus, institutional interventions should serve the nuances of these groups rather than devising a policy on a generic level. Lastly, it is recommended that ecologists should interact with each other through online platforms, engage in virtual talks and symposiums, and keep updating their peers and colleagues about research plans and outcomes.

LIMITATIONS

The results and interpretations are limited by not considering gender and family structure (like nuclear family, family with no children, family with toddlers and teenagers, etc.) for the study, and thereby introducing those variables would have detailed more about ecologists' perceptions of WFH.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The investigators took consent from the respondents before they participated in the survey. The entire study abided by the ethical guidelines of social science research as prescribed in '*Guidelines for Research Ethics in the Social Sciences, Law and the Humanities*', National Committees for Research Ethics in Norway.

CONFLICT OF INTEREST

The authors declare no competing interests. There is not any clash of attentiveness in this study.

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REFERENCES

- Attavar SPK 2021. Connected to devices, disconnected from children: Struggles of urban, dual-earning parents in India during COVID-19. *Journal of Children and Media*, 15(1): 138-141.
- Ayre C, Scally AJ 2014. Critical values for Lawshe's content validity ratio: Revisiting the original methods of calculation. *Measurement and Evaluation in Counseling and Development*, 47(1): 79-86.
- Baker E, Avery GC, Crawford JD 2007. Satisfaction and perceived productivity when professionals work from home. *Research and Practice in Human Resource Management*, 15(1): 37-62.
- Bai JJ, Brynjolfsson E, Jin W, Steffen S, Wan C 2021. *Digital Resilience: How Work-From-Home Feasibility Affects Firm Performance (No. w28588)*. Cambridge: National Bureau of Economic Research.
- Barkur G, Vibha GBK 2020. Sentiment analysis of nationwide lockdown due to COVID 19 outbreak: Evidence from India. *Asian Journal of Psychiatry*, 51: 102089.
- Beck MJ, Hensher DA 2021. Australia 6 months after COVID-19 restrictions part 2: The impact of working from home. *Transport Policy* (in press).
- Bick A, Adam B, Karel M 2020. Work from Home After the COVID19 Outbreak. *Working Papers 2017*, Dallas: Federal Reserve Bank of Dallas.
- Bin AS 2015. The relationship between job satisfaction, job performance and employee engagement: An explorative study. *Issues in Business Management and Economics*, 4(1): 1-8.
- Bloom N 2014. To raise productivity, let more employees work from home. *Harvard Business Review*, 92(1/2): 28-29.
- Bloom N, Liang J, Roberts J, Ying ZJ 2015. Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1): 165-218.
- Bonacini L, Gallo G, Scicchitano S 2021. Working from home and income inequality: Risks of a 'new normal' with COVID-19. *Journal of Population Economics*, 34(1): 303-360.
- Chauhan P 2021. Gendering COVID-19: Impact of the pandemic on women's burden of unpaid work in India. *Gender Issues*, 38(4): 395-419.
- Collewet M, Sauermaun J 2017. Working hours and productivity. *Labour Economics*, 47(C): 96-106.
- Daud K, Turiman MS, Rahmat NH, Kasi PM 2021. Working from Home in the New Normal: Perceived Benefits and Challenges. *Manuscript presented in International Virtual Symposium: Research, Industry & Community Engagement (RICE 2021)* in Akademi Pengajian Bahasa, UTM Shah Alam, Selangor, 25 June, 2021.
- Debata B, Patnaik P, Mishra A 2020. COVID 19 pandemic! It's impact on people, economy, and environment. *Journal of Public Affairs*, 20(4): e2372.
- Deshmukh SG, Haleem A 2020. Framework for manufacturing in post-COVID-19 world order: An Indian perspective. *International Journal of Global Business and Competitiveness*, 15: 49-60.
- Dewi I, Adiarsi GR 2020. Leveraging the COVID-19 crisis in making work-from-home a mainstream practice in the oil and gas industry. *International Journal of Multicultural and Multireligious Understanding*, 7(6): 305-316.
- Dingel JI, Neiman B 2020. How Many Jobs Can be Done at Home? *Working Paper No. 26948 at Working Paper Series*, Cambridge: National Bureau of Economic Research.
- Dubey AD, Tripathi S 2020. Analysing the sentiments towards work-from-home experience during covid-19 pandemic. *Journal of Innovation Management*, 8(1): 13-19.
- Eiszele H 1998. Telework: Nice in theory. *Australian Financial Review*, 27-28.
- Etheridge B, Wang Y, Tang, L 2020. Worker Productivity During Lockdown and Working From Home: Evidence from Self-Reports (No. 2020-12). *ISER Working Paper Series*, Essex: Institute for Social & Economic Research.
- Etikan I, Musa SA, Alkassim RS 2016. Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1): 1-4.
- Ford D, Storey MA, Zimmermann T, Bird C, Jaffe S, Maddala C, Butler JL, Houck B, Nagappan N 2021. A tale of two cities: Software developers working from home during the covid-19 pandemic. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 31(2): 1-37.
- Fukumura YE, Schott JM, Lucas GM, Becerik-Gerber B, Roll SC 2021. Negotiating time and space when working from home: Experiences during COVID-19. *OTJR: Occupation, Participation and Health*, 41(4): 223-231.
- George TJ, Atwater LE, Maneethai D, Madera JM 2021. Supporting the productivity and wellbeing of remote workers: Lessons from COVID-19. *Organizational Dynamics*, 100869: 1-9.
- Gibbs M, Mengel F, Siemroth C 2021. Work from Home & Productivity: Evidence from Personnel & Analytics Data on IT Professionals. *University of Chicago, Becker Friedman Institute for Economics Working*

- Paper*, (2021-56), Chicago: Becker Friedman Institute for Research in Economics at University of Chicago.
- González GMC, Herrera BS, Rosero RV 2016. Development and psychometric tests of the instrument “caring” -short version to measure the competence of care at home. *Rev Univ Ind Santander Salud*, 48(2): 222-231.
- Goswami M 2022. Factors affecting overall life satisfaction for Work-From-Home employees: Evidence from India. In: Perfecto Gatabonton Aquino Jr., Revenio Cabanilla Jalagat Jr (Eds.): *Navigating the New Normal of Business with Enhanced Human Resource Management Strategies*. Pennsylvania: IGI Global Publishers, pp. 41-67.
- Haleem A, Javaid M, Vaishya R 2020. Effects of COVID 19 pandemic in daily life. *Current Medicine Research and Practice*, 10(2): 78-79.
- Hazarika OB, Das S 2021. Paid and unpaid work during the Covid-19 pandemic: A study of the gendered division of domestic responsibilities during lockdown. *Journal of Gender Studies*, 30(4): 429-439.
- Hayes S, Priestley JL, Ishmakhametov N, Ray HE 2020. “I’m not Working from Home, I’m Living at Work”: Perceived Stress and Work-Related Burnout before and during COVID-19. PsyArXiv 2020. From <https://psyarxiv.com/vnkwa/> (Retrieved on 30 March 2022).
- Hoonakker PL, Carayon P, Brown RL, Cartmill RS, Wetterneck TB, Walker JM 2013. Changes in end-user satisfaction with Computerized Provider Order Entry over time among nurses and providers in intensive care units. *Journal of the American Medical Informatics Association*, 20(2): 252-259.
- Hurley RF, Estelami H 2007. An exploratory study of employee turnover indicators as predictors of customer satisfaction. *Journal of Services Marketing*, 21(3): 186-199.
- Ipsen C, van Veldhoven M, Kirchner K, Hansen JP 2021. Six key advantages and disadvantages of working from home in Europe during COVID-19. *International Journal of Environmental Research and Public Health*, 18(4): 1826.
- Karanges E, Johnston K, Beatson A, Lings I 2015. The influence of internal communication on employee engagement: A pilot study. *Public Relations Review*, 41(1): 129-131.
- Khan MR, Wajidi FA, Alam S 2020. Effects of communication on employee motivation: Study of Pakistan’s State-Owned Oil Company. *Journal of Business and Economics*, 12(1): 77-84.
- Kumar P, Kumar N, Aggarwal P, Yeap JA 2021. Working in lockdown: The relationship between COVID-19 induced work stressors, job performance, distress, and life satisfaction. *Current Psychology*, 40(12): 6308-6323.
- Kurian RM, Thomas S 2022. Perceived stress among information technology professionals in India during the COVID-19 pandemic. *Theoretical Issues in Ergonomics Science*, 23(2): 182-198.
- Li J, Ghosh R, Nachmias S 2020. In a time of COVID-19 pandemic, stay healthy, connected, productive, and learning: Words from the editorial team of HRDI. *Human Resource Development International*, 23(3): 199-207.
- Lin HF 2007. Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2): 135-149.
- Luthans F, Peterson SJ 2002. Employee engagement and manager self-efficacy: Implications for managerial effectiveness and development. *Journal of Management Development*, 21 (5/6): 376-722.
- Majumdar P, Biswas A, Sahu S 2020. COVID-19 pandemic and lockdown: Cause of sleep disruption, depression, somatic pain, and increased screen exposure of office workers and students of India. *Chronobiology International*, 37(8): 1191-1200.
- Mann S, Chitranshi J 2021. Challenges faced by employees in maintaining work-life balance during work from home in Covid-19 pandemic in India. *Natural Volatiles & Essential Oils*, 8(5): 5504-5519.
- Mathias YL L, Kumar S 2020. Employees’ perceived benefits and drawbacks from “Work from Home” during Covid-19. *Palarch’s Journal of Archaeology of Egypt/Egyptology*, 17(6): 2943-2957.
- Mosadeghrad AM, Ferlie E, Rosenberg D 2008. A study of the relationship between job satisfaction, organizational commitment and turnover intention among hospital employees. *Health Services Management Research*, 21(4): 211-227.
- Mukherjee S, Narang D 2022. Digital economy and work-from-home: The rise of home offices amidst the COVID-19 outbreak in India. *Journal of the Knowledge Economy*, 1-22.
- Navinya C, Patidar G, Phuleria HC 2020. Examining effects of the COVID-19 national lockdown on ambient air quality across urban India. *Aerosol and Air Quality Research*, 20(8): 1759-1771.
- Neog S, Goswami R 2021. Work from Home and the young workforce of India in times of COVID-19- A qualitative analysis. *Vidyabharati International Interdisciplinary Research Journal*, 12(1): 22-33.
- Nilima N, Kaushik S, Tiwary B, Pandey PK 2021. Psycho-social factors associated with the nationwide lockdown in India during COVID-19 pandemic. *Clinical Epidemiology and Global Health*, 1(9): 47-52.
- Osorio VML, Jaimes LE 2019. Content and face validity of the Spanish version of the Sexual Self-Concept Inventory for early adolescent girls. *Investigacion y educacion en enfermeria*, 37(1): 10-19.
- Patacsil FF, Malicdem AR, Fernandez PL 2015. Estimating Filipino ISPs customer satisfaction using sentiment analysis. *Computer Science and Information Technology*, 3(1): 8-13.
- Phadnis S, Sengupta S, Chakraborty A 2021. Work from home, mental health and employee needs: A pilot study in selected information technology organizations in India. *Asia Pacific Journal of Health Management*, 16(3): 103-110.
- Person B, Sy F, Holton K et al. 2004. Fear and stigma: The epidemic within the SARS outbreak. *Emerging Infectious Diseases*, 10(2): 358-363.
- Peters P, den Dulk L 2003. Cross cultural differences in managers’ support for home-based telework: A theo-

- retical elaboration. *International Journal of Cross-Cultural Management*, 3(3): 329-346.
- Purwanto A, Asbari M, Fahlevi M, Mufid A, Agistiawati E, Cahyono Y, Suryani P 2020. Impact of Work from Home (WFH) on Indonesian teachers' performance during the Covid-19 pandemic: An exploratory study. *International Journal of Advanced Science and Technology*, 29(5): 6235-6244.
- Rab S, Javaid M, Haleem A, Vaishya R 2020. Face masks are new normal after COVID-19 pandemic. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 14(6): 1617-1619.
- Redmond P, McGuinness S 2020. Who Can Work From Home in Ireland. *ESRI Survey and Statistical Report Series* (87), Dublin: The Economic and Social Research Institute.
- Sanchez GD, Parra NG, Ozden C, Rijkers B, Viollaz M, Winkler H 2021. Who on Earth can work from home? *The World Bank Research Observer*, 36(1): 67-100.
- Schlesinger LA, Zornitsky J 1991. Job satisfaction, service capability, and customer satisfaction: An examination of linkages and management implications. *Human Resource Planning*, 14: 141-149.
- Shamir B, Salomon I 1985. Work-at-home and the quality of working life. *Academy of Management Review*, 10(3): 455-464.
- Silverman SB, Pogson CE, Cober AB 2005. When employees at work don't get it: A model for enhancing individual employee change in response to performance feedback. *Academy of Management Perspectives*, 19(2): 135-147.
- Srivastava K, Sethumadhavan A, Raghupathy H, Agarwal S, Rawat SR 2015. To study the Indian perspective on the concept of work from home. *Indian Journal of Science and Technology*, 8(S4): 212-220.
- Thorstensson E 2020. *The Influence of Working from Home on Employees' Productivity: Comparative Document Analysis between the Years 2000 and 2019-2020*. Informatik B-Thesis, Karlstad: Karlstad Business School, Karlstad University.
- Trochim WM 2006. The Research Methods Knowledge Base. 2nd Edition. From <<http://trochim.human.cornell.edu/kb/index.htm>> (Retrieved on 20 June 2020).
- Tudy RA 2021. From the corporate world to freelancing: The phenomenon of working from home in the Philippines. *Community, Work & Family*, 24(1): 77-92.
- Venkatesh A, Vitalari NP 1992. An emerging distributed work arrangement: An investigation of computer-based supplemental work at home. *Management Science*, 38(12): 1687-1706.
- Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, Mytton O, Bonell C, Booy R 2020. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child and Adolescent Health*, 4(5): 397-404.
- Weitzer J, Papantoniou K, Seidel S, Klösch G, Caniglia G, Laubichler M, Laubichler M, Bertau M, Birmann BM, Jäger CC, Zenk L, Steiner G, Schernhammer, E 2021. Working from home, quality of life, and perceived productivity during the first 50-day COVID-19 mitigation measures in Austria: A cross-sectional study. *International Archives of Occupational and Environmental Health*, 94(8): 1823-1837.
- Wheaton MG, Abramowitz JS, Berman NC, Fabricant LE, Olatunji BO 2012. Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. *Cognitive Therapy and Research*, 36(3): 210-218.
- Wells S, Rozenblum R, Park A, Dunn M, Bates DW 2015. Organizational strategies for promoting patient and provider uptake of personal health records. *Journal of the American Medical Informatics Association*, 22(1): 213-222.
- World Health Organization/Regional Office for Europe. Coronavirus Disease (COVID-19). From <<https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19>> (Retrieved on 23 June 2020).
- Wu H, Chen Y 2020. The impact of Work from Home (WFH) on workload and productivity in terms of different tasks and occupations. In: C Stephanidis, G Salvendy, J Wei, S Yamamoto, H Mori, G Meiselwitz, F Fui-Hoon, Nah K Siau (Eds.): *International Conference on Human-Computer Interaction*. Cham: Springer, pp. 693-706.
- Xiong Z, Li P, Lyu H, Luo J 2021. Social media opinions on working from home in the United States during the COVID-19 pandemic: Observational study. *JMIR Medical Informatics*, 9(7): e29195.

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