PROFILING OF PHYSIOTHERAPY FACILITIES AND CONSEQUENCE OF COVID-19 PANDEMIC ON PHYSIOTHERAPY PRACTICES IN 2020 IN ODISHA, INDIA.

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Dedicated to my dear parents, younger brother and almighty

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DECLARATION

I hereby declare that this dissertation titled "**The profiling and distribution of physiotherapy facilities and consequence of COVID-19 pandemic on the physiotherapy practices in 2020 in Odisha** " is the bonafide record of my original field research. It has not been submitted to any other university or institution for the award of any degree or diploma information derived from the published or unpublished work of others has been duly acknowledged in the text.

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CERTIFICATE

Certified that the dissertation entitled "**The profiling and distribution of physiotherapy facilities and consequence of COVID-19 pandemic on the physiotherapy practices in 2020 in Odisha**" is a record of original research work undertaken by Adarsha Brahma, in partial fulfilment of the requirement for the award of the degree of "Master of Public health", under my guidance and supervision.

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ABBREVIATION

BPT- Bachelor in Physiotherapy

MPT- Master in Physiotherapy

GIS - geographical information system

WHO- World Health Organisation

IAP- Indian Association of Physiotherapy

SARS-Cov-2 - Severe Acute Respiratory Syndrome -Coronavirus 2

API – Application programming interface

% change – Percentage change

km- kilometre

ABSTRACT

Background

Profiling of physiotherapy facilities helps to identify the number and distribution of the facilities and the practising physiotherapists across an area. Physiotherapy facilities and physiotherapists were also affected by the COVID-19 pandemic, as in the case of other heath care workers. The profiling of physiotherapy facilities and consequences of COVID-19 pandemic on physiotherapy practice were not studied in Odisha. The objectives of the study were to identify the qualified physiotherapy practitioners, types of physiotherapy practices, distribution of physiotherapy facilities and to know the consequences of the COVID-19 pandemic in physiotherapy practice.

Methodology

A cross-sectional survey of 411 physiotherapists practising physiotherapy in Odisha. The Structured interview prepared on KoboCollect App in the mobile phone included the address, socio-demographic details, details regarding practice, etc. Population data was collected from census 2011 for Odisha state. Geo-coding of the addresses of physiotherapy facilities has been done the Google Geocoding API key.

Results

More male physiotherapists (64.96%, n=267) are practising in Odisha compare to females(35.04%, n=144). More physiotherapists are practising in the private sector 72.02%(n=296) than in the government sector 27.98% (n=115). Most of them are pactising in the urban areas (96.35%, n=396) and only a few(3.65 %, n=15) are practising in the rural areas. Two thirds (60.15%, n=83) of those who were doing house visits as the only mode of practice, were severely affected in Covid19. All the private facilities(n=261) were affected by the COVID-19 pandemic in Odisha. In the government sector, most of the patients were treated in the outpatient departments (91.30%,105) during the first wave of the Covid-19 pandemic as .in the private sector (97.83%,n=45). Out of the 411 physiotherapists, 83.65%(n=343) had anxiety/fear about the transmission of COVID-19 to them and their family members because of their practice.

Conclusion

The physiotherapy facilities and physiotherapists are unequally distributed across the state of Odisha. There is significant decrease in the number of patients seen and the revenue for the practising physiotherapists in Odisha due to Covid-19. Most of the physiotherapists were anxious or afraid of the spread of COVID19 to them or to their family members because of their practice.

1. INTRODUCTION

1.1. Background

Profiling of physiotherapy facilities helps to identify the number and types of the physiotherapy facilities, area of practice, the number of physiotherapists, educational and experience of the physiotherapist, etc. It is advantageous for policymakers for proper planning and future allocation of resources to improve the physiotherapy facilities for the betterment of the population in need (Eighan J *et al.,* 2019). There have been evidence of inequality in accessing physiotherapy services in rural areas and the lack of awareness of the public towards physiotherapy treatment in rural area due to the lower level of education (Mbada C *et al.*, 2019). As per the World health organization (WHO), many countries, both developing and developed ones have reported persistent inadequacy in physiotherapy facilities that too with unequal geographic distribution. They have also reported inadequacy in the availability of physiotherapy professionals to cater to the needs of the population. Like in many other developing countries, in India too, the Government provides limited budget allocations for the physiotherapy profession and there is no professional council for physiotherapy practitioners in the country. (world health organization, 2011).

The covid-19 pandemic began in December 2019. During the first wave of this pandemic, the government announced a series of lockdowns as a preventive measure. Except for emergency services, all other facilities and organizations remained unavailable for long periods. All services including the medical and paramedical services had gone through major financial loss. Among the medical services, only the emergency medical services were functional during the lockdown period. Physiotherapy facilities also remain closed, except the ones that were providing acute care (acute facility- physiotherapy setup in the multispeciality hospital where postoperative patients are treated). All physiotherapy

facilities had incurred substantial financial loss during the lockdown period. There was a decrease in the flow of patients to the physiotherapy facilities providing acute care whereas other types of physiotherapy facilities were completely closed. After reopening these facilities during the partial revocation of lockdown, there was a decrease in the patient flows either due to fewer people turning up to these facilities or due to a lesser number of appointments being given by the clinics to decrease the spread of infection by following the social distancing norms of the government(Alpalhão and Alpalhão, 2020). This study is an attempt to look at the consequences of physiotherapy services in Odissa due to the first wave of Covid-19.

1.2. Review of literature

1.2.1. Definition Of Physiotherapy

World confederation for physical therapy defines a physiotherapist as "A professional who is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, intervention, habitation, and rehabilitation. This encompasses social, psychological, physical and emotional well-being" (world council of physiotherapy, 1951).

1.2.2. Guidelines by WHO:

As per WHO norms, the ratio of the physiotherapist to population should be 1:10000. Both the developed as well as developing countries reported that there have been inadequate, unstable, or non-existent supplies and unequal distribution of rehabilitation professionals and services across the world (world health organization, 2011).

1.2.3. Physiotherapy and its uses

The demand for physiotherapy services is predicted to increase at a significant rate owing to the rising geriatric population across the world. Older people usually suffer from various diseases like arthritis, cardiovascular diseases, and chronic pain. So, there is a rise in need and demand for availing physiotherapy facilities as well as palliative care which are provided by physiotherapists (*Physiotherapy Services Market - Global Industry Analysis, Forecast - 2024*). In an ageing population, the need for service is associated with an increase in morbidity and demand for chronic care. Physiotherapy intervention is also found to be very useful for long-term care of older persons in reducing disability and improving the physical condition (Forster, 2009). Exercise therapy is found to be useful in a wide range of health conditions like cystic fibrosis, frailness in elderly people, Parkinson's disease, stroke, osteoarthritis of knee and hip, heart diseases, and low back pain, by increasing strength, endurance, and flexibility of joints. Physiotherapy can improve balance, posture, and range of motion or functional mobility and reduce the risk of falls. (Jolliffe, 2001; Fransen, McConnell and Bell, 2003).

Musculoskeletal conditions are the second largest cause of disability worldwide and the major cause of morbidity, measured by the years lived with disability (YLD), with low backache being the most common condition. The community-based prevalence of musculoskeletal disorders globally ranges from 14 per cent to as high as 42 per cent. In India, the prevalence of the musculoskeletal disorder is 20% and occupation-specific disorder prevalence is as high as 90% of the total occupational disorders (Vos, 2012; Storheim and Zwart, 2014). Most musculoskeletal disorders progress over time due to the nature of work or because of the working environment. The symptoms arise from discomfort, minor aches, and occasional pain which require time off from work and often need medical attention (European Agency for Safety and Health at Work). Physiotherapists

prove to be more helpful for patients with musculoskeletal disorders as compared to physicians in terms of diagnostic accuracy, treatment effectiveness, use of healthcare resources, economic cost, and patient satisfaction (Desmeules, 2012).

Physiotherapy helps patients with joint replacements to function optimally, by increasing the range of motion of joints and helping them to get back to their normal gait by prescribing exercises (Westby, Brittain, and Backman, 2014; Artz, 2015).

In the case of functional motor disorders where the patient suffers from weakness in the limbs, the main problem is with the gait and the functional movements which is mainly due to incoordination. Physiotherapy helps the patient to restore the movement and strengthen the muscles of the limbs by which the patient can get back to his/her normal life (Nielsen *et al.*, 2015). After the cerebral hemorrhagic stroke, post-stroke physiotherapy plays a major role in reducing disability by strengthening the paralyzed muscle and improving the functional ability through gait training (Ontario Health (Quality), 2020). Physiotherapist plays a vital role in the promotion of health and wellbeing by restoring or maintaining the maximum functional movement in individuals with long term neurological disabilities (Mulligan, 2011).

1.2.4. Geographical Information System used in public health

Geographic Information Systems (GIS) makes it easier to integrate, consolidate and present varied databases that cover ecological variables. It can also be used to look into statistical relationships that may vary from place to place. The GIS can then be used to create visually appealing high-impact maps. GIS has been used in the field of environment, health, disease ecology, and public health as a tool for processing, analyzing, and visualizing data. It is a special tool that permits the integration of multiple data sources, visual presentation of complex data patterns, and application of multiple spatial analytic techniques to answer a

variety of questions. The GIS is a technology that permits people with many facilities in a collection of settings to integrate and analyse (spatial) data to answer the relevant questions vividly and automatically (McLafferty, 2003).

According to the world health organization, access to healthcare is "the continuing and organized supply of its care that is geographical, financial, cultural, and functional which is easily available to the whole community" (*Primary health care : report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978 / jointly sponsored by the World Health Organization and the United Nations Children's Fund*, p. 1978). A GIS-based study is helpful to calculate the number of hospitals required in a particular place as per the population and their need and the number of facilities available in that particular place through remote sensing data, (Rai and Nathawat, 2013). GIS-based analytical approaches are utilized for designing accessibility to healthcare services, which depends on the availability of a set of spatial data (e.g., distance from home to health care facility) and non-hospital data (e.g., estimation of the demand-based demographic characteristic of the population), (Khashoggi and Murad, 2020). Geographical information system facilitates the visualization and monitoring of infectious disease, as well as documents and shows the healthcare requirements of the community based on the availability of resources and materials (Fradelos, 2014).

1.2.5. Profiling and geographic distribution of physiotherapy facilities

Studies have shown that physiotherapy services are mostly distributed in metropolitan cities and specialized hospitals in the private sector with restricted participation in the public sector. The majority of physiotherapists engage with the private sector as compared to the public sector. A very small number of physiotherapy facilities providing primary care

is available in Brazil (Costa, 2012). The use of physiotherapy facilities is very low in rural communities of Nigeria due to the compromised education status of the people and inadequacy of facilities. Therefore, the governments should create awareness among people about health conditions related to ageing, pain, and benefits of physiotherapy which may cause them relief in their health conditions in rural communities (Mbada C *et al.*, 2019).

1.2.6. Geographical Information System used for profiling of physiotherapy facilities across the world

A study done in Ireland to examine the geographic variation in physiotherapy supply as per the population health needs of the physiotherapy facilities found that the physiotherapy facilities are unequally distributed across Ireland (Eighan J *et al.*, 2019). The author divided physiotherapy facilities into two types based on the types of cases they deal with such as acute and non-acute. Acute physiotherapy facilities are the ones that are present in specialized hospitals where post-operative acute patients are being provided with physiotherapy care as per their need. Non-acute physiotherapy facilities are the ones that are present in orthopaedic and neurological rehabilitation centres where care for patients with chronic disorders are provided. Non-acute physiotherapy centres are available as compared to acute physiotherapy facilities. More female physiotherapists were practising in acute care as compared to the number of male physiotherapists practising in non-acute private facilities (Eighan J *et al.*, 2019). Another research was done in Saskatchewan, Canada to examine the population health characteristics and the self-reported physiotherapy use as per the distribution of physiotherapy facilities by using geospatial mapping analysis of the actual population need for physiotherapy facilities and the availability of physiotherapy facilities across the city (McFadden *et al.*, 2016). Another study in Canada examines the intra-urban variability of geographical access to dental service and physiotherapy facilities compared with the family physicians in the urban area.

It was seen that there was inequality in dental and physiotherapy facilities within the primary health centre. Using geospatial analysis, it was seen that physiotherapy facilities are congregated mainly in the city or urban areas (McFadden *et al.*, 2016).

1.2.7. Covid-19

Novel coronavirus disease is a viral infectious disease caused by the Severe Acute Respiratory Syndrome -Coronavirus 2 (SARS-CoV-2) that is newly discovered in 2019. People infected with the Covid-19 virus experienced mild to moderate respiratory illness. Older people with co-morbidities like cardiovascular problems, diabetes, chronic respiratory disease, and cancer may get the more severe disease and sometimes end up in complications. The virus primarily spreads through droplets of saliva or nasal secretions when an infected person coughs or sneezes. As there is no vaccine or treatment, people have to adopt preventive measures like maintaining social distance, wearing a mask, and maintenance of hand hygiene to keep themselves safe from infection (*Coronavirus*, WHO). To prevent the spread of Covid-19, the Government of India had declared a nationwide shutdown and lockdown during the first wave of the pandemic. Though there were relaxations for some services like medical casualty, ration shops, medicine shops, and to some extend for farming and dairy farms, many rehabilitation centres had to shut down to avoid physical contacts ('Guidelines_related to lockdown due to Covid-19 pandemic in India, 25-03-2020') Novel coronavirus gives rise to serious acute respiratory syndrome (SARS), which is a sudden life-threatening condition.

1.2.8. The consequence of Covid-19 on Health care workers-

WHO declared Covid-19 as a pandemic on March 11, 2020. There was extra pressure on health care workers because of increased workload, physical exhaustion, inadequate number of personal protection kits and nosocomial transmission of the virus. It affects the physical and mental condition of health care workers. Additionally, isolation, loss of social

support, risk of infections of friends and relatives can create mental health problems such as fear, anxiety, depression, and insomnia (Pappa *et al.*, 2020). Lockdowns and shutdowns due to the Covid-19 pandemic lead to postponements of elective surgeries for an indefinite period. In case of urgent cases, the individual had to undergo a COVID test and only a Covid negative individual could undergo the required surgery. Virtual consultation and telemedicine were introduced to treat the patients. This pandemic had much financial impact on physicians and dentists as their practices were severely affected. Even after the relaxation of lockdown regulations, many physicians and surgeons were not be able to restart their services due to a lack of patients. The fear of infection might have prompted individuals with not-so-serious health conditions also not to consult the physicians for treatment. The salaries of doctors in private hospitals have decreased due to a decrease in patient flow. Similarly, there could be an effect on the salaries of doctors in a government hospital due to the economic crisis (Ferneini, 2020).

1.2.9. The consequence of Covid-19 pandemic on Physiotherapist

At the time of the outbreak of Covid-19, the government passed a rule that except for emergency care services all other things should remain close. Physiotherapy practice was severely affected by this pandemic mainly because of the nature of the treatment. Even if the clinics were made accessible there was a high chance of spreading infection from an asymptomatic patient to the physiotherapist or from the physiotherapist to the patient. The patient may suffer from severe illness due to other comorbidities. So, physiotherapists had to adopt some additional methods to avoid infection like using proper personal protection equipment, which has to be changed and disposed of after treating each patient. The practice of maintaining proper social distancing has eventually led to a decrease in patient flow. The use of new technological interventions like telemedicine also contributed to the

decrease in patient flow to the rehabilitation centres as telerehabilitation became a viable option for the people (Alpalhão and Alpalhão, 2020).

Physiotherapists had to experience negative consequences of the Covid-19 pandemic which had impacted them economically, socially, and also psychologically. Private physiotherapy practitioners have serious concerns about their job security and business viability. They even went ahead and cancelled their travel and wedding plans. This has further led to a rise in anxiety and depression among physiotherapists. Private practitioners started using newer technological options for their benefit and were trying to provide telerehabilitation and teleconsultation services, despite this there had been a significant decrease in their income. Those physiotherapists working in hospitals were given other duties along with their original work during the pandemic to meet the scarcity of the workforce. Thus, physiotherapists are either dealing with acute conditions or are being appointed in the Covid ward. This is becoming very stressful for them as it leads to anxiety and depression. As per the study conducted by Haines and Berney, many physiotherapists tried meditation to maintain health and exercise to cope up with stressful situations (Haines and Berney, 2020).

A study was done among the physiotherapists and it was seen that physiotherapists usually do a lot of physical activity every day while providing physical therapy to their patients. The frequency of treating patients with manual therapy has decreased after the Covid-19 pandemic. They are attending patients virtually through video or audio calls. So, there has been a decrease in the energy expenditure of physiotherapists which could result in many health issues for them. The change in the pattern of job may also add to the psychological stress (Srivastav, Sharma, and Samuel, 2020).

1.3. Justification/ Rationale for the study:

There is no study in Odisha for profiling of physiotherapy facilities and consequences of Covid-19 on physiotherapists and physiotherapy facilities. The proposed study will be

useful for the identification of qualified physiotherapy practitioners, to get the number of practising physiotherapists in Odisha, and to document the distribution of physiotherapy facilities across the state. This study will also help us to know about the consequence of the first wave of Covid-19 pandemic on physiotherapy practitioners and how they had coped with the situation.

CHAPTER 2: METHODS

2.1. Research Questions

1. Does the distribution of physiotherapy facilities follow the population spread in Odisha?

2. What are the consequences of the first wave of Covid-19 pandemic on physiotherapy practice, and how did physiotherapists cope with the Covid-19 pandemic situation in Odisha state in 2020?

2.2 Objectives of the study

1- To study the profile and distribution of physiotherapy facilities in Odisha.

2- To study the consequences of the Covid-19 pandemic on the physiotherapy practice in Odisha.

2.3. Study type/design:

It is a quantitative study. A cross-sectional survey on practising physiotherapists in Odisha.

2.4. Study setting

Place: Odisha state, India.

Odisha state is geographically located in the north-eastern part of India, between the parallels of 17.49' N & 22.34'N latitudes and meridians of 81.27'E & 87.29'E longitudes. The Bay of Bengal covers Odisha on the east, Chhattisgarh on the west, Andhra Pradesh & Telangana on the south, and Jharkhand & West Bengal on the north & northeast part. The state is divided into 30 districts. As per the census 2011, the total population of the state is 4,19,74,218. The rural population is 3, 49,70,562 and the urban population is 70,03,656. Roughly one-fourth (22.8% of the total population of, i.e., 95, 90,756 are tribal people. (Source: http://odisha.gov.in/)

(*Odisha Government Portal*)(2.1- District level map of Odisha)

2.5. Study population

The study population includes physiotherapists who are practicing physiotherapy in the public or private sector in Odisha with a Bachelor in Physiotherapy(BPT) degree.

2.6. Time frame

The data were collected during three months between December 8, 2020, and March 3, 2021.

2.7. Sample Size / Sampling method

At the time of data collection, only five physiotherapy degree-providing colleges were present in Odisha. The contact details of physiotherapists were collected from those physiotherapy colleges. This study is for the physiotherapists who graduated from one of the colleges in Odisha having a BPT degree and doing jobs or running their clinics in

Odisha. The Indian Association of Physiotherapy, Utkal branch, was contacted for collecting the contact details of the physiotherapists who had graduated out from these universities. The contact details of 507 physiotherapists were collected.

From the list of 507 physiotherapists, the researcher was able to contact 411 who were practising in Odisha after completing Bachelor in Physiotherapy (BPT). The researcher could not reach out to 37 physiotherapists, their contact numbers were either out of the coverage area or switched off. Among the rest of the non-participants, 32 were pursuing higher studies., nine were females who discontinued their practice after marriage, and 18 were practising in other states.

2.8. Data collection techniques

1- The Structured interview prepared on KoboCollect App on the mobile phone that collected information including address, socio-demographic details, details regarding practice, etc. (QUESTIONNAIRE-1, Appendix- 1)

2- Population data was collected from census 2011 for Odisha state.

3- Geo-coding the addresses of physiotherapy facilities was using the Google Geocoding API key. These were used for the preparation of thematic maps.

Participant Information Sheet and Consent Form were read out to all participants over the telephone. They were told in brief about the study, and their oral consents were recorded before commencing the interview. (see Appendices I, II)

Shapefile of Odisha district level boundaries map based on census 2011 was taken from the geospatial resources of Achutha Menon Centre for Health science studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala.

Primary data was collected in the kobo toolbox (https://www.kobotoolbox.org). There is an option to download the excel format of the data sheet from that application. The datasheet was downloaded from the kobo account. All the data cleaning and data analysis were done in R software version 4.0.3 (https://www.r-project.org/).

Data cleaning has been done in a reproducible manner with R software and the R-scripts were saved.

2.9. Study variables

2.9.1. Outcome variables

I – Location and types of physiotherapy practices in Odisha.

The geocodes of the locations of physiotherapy facilities were captured from their corresponding addresses. The types of facilities were captured from the interview schedule.

II – Percentage(%) change in the patients seen per day of the physiotherapy practices before and after the Covid-19 pandemic.

This is estimated using the following formula.

$$\%\ \text{change in patients seen per day} = (100 - \frac{(\text{Daily patients before Covid19} - \text{Daily patients after Covid19})}{(\text{Daily patients before Covid19})})$$

Most of the facilities or practitioners might have suffered a reduction in their patients per day and therefore their % change inpatients per day are expected to be less than 100. However, a few might have gained more patients during the pandemic, and they might get values for % change in patients per day above 100.

2.9.2. Predictor variables

I- Education of the Physiotherapists

II- Gender of the Physiotherapists

III- Practicing experience of the Physiotherapists

2.10. Data analysis and statistical methods

The analysis was done using R software version 4.0.3. Univariate analysis was done with all variablesBivariate analysis was done with predictor and outcome variables. The unpaired t-test was done to examine the statistical significance of the association, wherever appropriate., The geospatial analysis of the location, types of physiotherapy facilities, according to their education, population density, % change in patient seen per day, etc were done

2.11. Data storage

The data collected from the interviews as well as from the Indian Association of physiotherapy and the Alumni group were stored in the digital forms as password encrypted files.

2.12. Ethical considerations

The ethical clearance was obtained from the Institute Ethics Committee (IEC) of SCTIMST vide letter number SCT/IEC/1583/NOVEMBER/2020 (Appendix -IV).

The formal permission was taken.

Utmost priority was given to protect the privacy and confidentiality of the information provided by the participants. The collected information was shared only with the thesis guide, and analysis was done without the identification details. At no stage in analysis or reporting the research findings, the participants' identities were revealed.

The researcher took oral consent from all the study participants after explaining the study. It was explained to the participant that they may or may not be directly benefited from the study. The participants were assured that confidentiality will be maintained and their

identity will not be used for any other purposes. The principal investigator explained to the participants their right to refuse to answer at any time of the study.

2.13. Dissemination of results

The results of this study would be distributed through the publication of papers in research journals.

CHAPTER 3 - RESULTS

In this chapter, the findings of the study are discussed. There are two main sections in this chapter. The first section shows the results of profiling and distribution of physiotherapy facilities across Odisha, and the second section shows the consequences of the Covid-19 pandemic in the physiotherapy practice in Odisha. Out of 507 physiotherapists identified from the lists, 411 participated in the study. The response rate was 80%.

3.1. Results for Profiling and distribution of Physiotherapy facilities

The results of the profiling and distribution of the physiotherapy facilities are described in Table 3.1 followed by gender, education, types, locations, mode of practice, the primary mode of practice, type of clinical setting, the experience of the physiotherapists, and the radius of practice jurisdiction.

There are more number male physiotherapists (64.96%, n=267) than females (35.04%, n=144). The physiotherapists practising after BPT were 58.39% (n=240), MPT were 40.15% (n=165) and after PhD were (1.46%, n=6). The private physiotherapy Practitioners were 72.02%(n=296) and government physiotherapy Practitioners were 27.98% (n=115) in Odisha. Most of the physiotherapists(96.35%,n=396) were practising in the urban areas while fewer number(3.65 %,n=15) of physiotherapists were practising in the rural areas. When asked about their practising facilities, 60.58% (n=249) of physiotherapists were practising both in a private clinic and home visit, 36.74% (n=151) of physiotherapists were in a hospital, and home visits, 2.68%(n=11) of physiotherapists were practising in both government and private hospitals. The primary mode of practice means on what mode of practice a physiotherapist mainly depends on their revenue income. More physiotherapists (60.83%, n=250) dependent on private practice as compared to the Government hospital practice (39.17%,n=161).

There are two types of clinical settings - i) Non-acute clinical setting, where the physiotherapy treatment can be given to the patient in the rehabilitation phase/ chronic phase. ii) Acute clinical setting where the post-operative patients can get physiotherapy treatment. The acute clinical setting is mostly present in multi-speciality hospitals, government hospitals, and well-established nursing homes. Large numbers of physiotherapists (60.82%,n=250) worked in the non-acute physiotherapy facility, and the rest 39.17%(n=161) of the physiotherapists were working in both the non-acute and acute physiotherapy facilities.

Table 3.1. Profiling of Physiotherapy facilities

Variables	**Category**	**Frequency (N=411)**	**Percent(100%)**
Gender	Male	267	64.96%
	Female	144	35.04%
Education	BPT	240	58.39%
	MPT	165	40.15%
	PhD	6	1.46%
Types of facilities	Private	296	72.02%
	Government	115	27.98%
Location of Practice	Urban	396	96.35%
	Rural	15	3.65%
Mode of Practice	Private clinic and home visit	249	60.58%
	Hospital and home visit	151	36.74%

	Hospital and private clinic	11	2.68%
The primary mode of practice	Private	250	60.83%
	Government	161	39.17%
Type of clinical setting	Non-acute	250	60.83%
	acute and non-acute	161	39.17%

The minimum, maximum, means, and standard deviations of professional experience of the physiotherapists, distance from where the patients were coming to the facility, and how many kilometres (km) physiotherapists were going for home visits are given in Table 3.2.

The average experience of physiotherapists was found to be six years. The minimum experience of physiotherapists was found to be one year and the maximum experience of the physiotherapists was found to be 36 years. Patients on average are travelling 58 kms to avail themselves physiotherapy care from the facilities. The minimum 600 kms, respectively. The physiotherapists were travelling, on an average, 10 kms to visit a patient, the range being five and fifteen kms.

Table 3.2. Professional experience, and extent of the practising area.

Variables	Minimum	Maximum	Mean	Standard Deviation
Experience of the physiotherapists	1year	36 years	6 years	4
Distance from patients residence to physiotherapy facility	2 kms	600 kms	58 kms	85
Distance travel by physiotherapist for house visits	5 kms	15 kms	10 kms	3

The Mean and standard deviation of the patients seen in 2019 (before Covid-19 and in 2020 (after Covid-19) and the percentage change in patients seen per day are given in Table 3.3. Please note that the % change in patients seen per day is estimated using the formula given below.

$$\%\ \text{change in patients seen per day} = (100 - \frac{(\text{Daily patients before Covid19} - \text{Daily patients after Covid19})}{(\text{Daily patients before Covid19})})$$

Table 3.3 Details of the patients seen per day

	average number of patients treated per day	**Minimum**	**Maximum**	**Standard Deviation**
In 2019 (before Covid-19)	29	9	100	16
In 2020 (after Covid-19)	23	2	100	15
% change in patients seen per day	79	22	200	27

An average of 29 patients per day was treated by physiotherapists in 2019 which was the pre-Covid situation. A minimum number of nine patients were treated per day and the maximum number of 100 patients were treated per day by the physiotherapists in 2019. An average of 23 patients were treated per day by physiotherapists in 2020 which is the post-Covid situation. A minimum number of two patients were treated per day and the maximum number of 100 patients were treated per day by the physiotherapists in 2020. An average of 79 % change in patients flow were seen in the physiotherapy facilities compare to the pre-Covid situation. A minimum % change in patients flow were 22 and the maximum % change in patients flow were 200 to the facilities compare to the pre-Covid situation. This means that some physiotherapists had gained patients compared to their pre-Covid-19 situation.

3.2. Results for the consequence of Covid-19 on physiotherapy Practice

The consequence of the Covid-19 pandemic was different for different types of practices. Physiotherapists were mainly doing four types of practices in Odisha. Those types of practices were house visits to the patient's house, practice in private clinics, practice in the government hospital, and practice in a private hospital.

3.2.1. Result for Consequence of Covid-19 on the practitioners doing house visits

Table 3.4 shows the consequence of the Covid-19 pandemic on the physiotherapists who were doing house visits. The Majority of physiotherapists (60.15%, n=83) who were doing house visits as the only mode of practice were severely affected in Covid19. All the physiotherapists (100%, n=138) who were practising in-house visits were affected by a decrease in patient flow and loss of income. As there was lockdown from March to July in Odisha, the physiotherapists with home visits, responded that 29.71% (n=41) of them had the same patient flow as compared to pre-pandemic situation, 31.88%(n=44) had a decrease in patient flow as compared to that of the pre-pandemic situation, 31.15%(n=43) of physiotherapists had discontinued home visits due to the pandemic. 7.24% (n=10) of physiotherapists had an increase in patient flow than before the pandemic. When the lockdown regulations were slowly relaxed, from August to December, 44.20% of physiotherapists had the same patient flow as compared to before the pandemic, 53.62%(n=53.62) had a decrease in patient flow as compared to before the pandemic situation, and only 2.17%(n=3) of physiotherapists discontinued practising. The majority of physiotherapists (61.31%, n=84) had reduced income due to the Covid-19 pandemic. Most of them had lost (66.66%, n=56) 75-100% of revenue at the time of the pandemic;17.85% (n=15) had a loss of 50-75%, 9.52%(n=8) had a loss of 25-50% and only

5.97% (n=5) had a loss of 0-25% revenue at the time of pandemic as compared to before the pandemic. Most of the physiotherapists (97.82%, n=135) did not opt for more home visits after the onset of the Covid-19 to compensate for the loss of income.

Table 3.4. The consequence of Covid-19 on the House visit

Variables	Category	Frequency(N=138)	Percent (100%)
Impact on professional practices	Yes	83	60.15%
	No	55	39.85%
Covid-19 pandemic affected professional practices	Income and Professional practices	84	100%
Impact of the pandemic on the number of patients seen per day(March to July)	Patient flow same as before the pandemic situation	41	29.71%
	Patient flow decreased as before the pandemic situation	44	31.88%
	Stop practising	43	31.15%
	Patient flow increases	10	7.26%

Impact of the pandemic on the number of patients seen per day (From August to December)	Patient flow same as before the pandemic situation	61	44.20%
	Patient flow decreased as before the pandemic situation	74	53.62%
	Stop practising	3	2.18%
Covid-19 pandemic results in a reduction in income	Yes	84	61.31%
	No	54	38.69%
Revenue loss as compared to before the pandemic(N=84)	75-100%	56	66.67
	50-75%	15	17.86%
	25-50%	8	9.52%
	0-25%	5	5.95%
start more home visits after the onset of Covid-19 to compensate for the loss	Yes	3	2.18%
	No	135	97.82%

3.2.2. Results for the consequence of the Covid-19 on private clinic practices

Table 3.5 shows the results of the consequence of the Covid-19 pandemic on the physiotherapists who were practising in the private clinic. All private physiotherapy facilities (n=261) were affected by the Covid-19 pandemic in Odisha. Most physiotherapists (81.15%, n-211) responded that their clinics were completely closed for some months and their working hours also decreased. The lockdown was going on when the pandemic started from March to July; 15.70% (n=41) of physiotherapists said that patient flow was the same as before the pandemic situation. Most of them (84.30%,220) responded that the physiotherapy facilities were closed or closed for several months between March to July. On reopening the facilities after the lockdown rules were relaxed from August to December, only for 10.34% (n=27) the patient intake was the same, for 88.12% (n=230), had decreased patient intake and 1.54%(n=4) clinics were completely closed, had not been able to reopen. The reasons for closing the facilities, as narrated by 91.12%(n=236) of physiotherapists were due to the mandatory orders from the government, unavailability or insufficiency of safety precautions such as personal protection equipment (PPE) kit, or limits in space for maintaining a physical distance, etc. A small proportion (8.88%, n=23) of physiotherapists responded that patients were unwilling to come to the clinic and wanted telerehabilitation. All these physiotherapists (n=261) said that they had a reduction in their income due to the Covid-19 pandemic. Most of them (44.06%,115) responded that they had lost 50-75% of the revenue; another 27.20% (71) had lost 75-100% of their revenue, 20.68%(n=54) had lost 25-50% of their income and 8.04%(n=21) had lost 0-25% of their income in the Covid-19 situation. More than half (66.53%, n=173) of physiotherapists were able to pay the essential bills, including electricity bills, house rent, the salary of the staff. Most of them (87.86%, n=152) paid the essential bills from their savings, and 12.14%(n=21) of them took to loans to pay the essential bills. Another group

(65.90%, n=172) of physiotherapists increased their treatment fees after the clinic reopened. A proportion of 11.50%(n=30) of physiotherapists was working as salaried staff and so have not responded to this question. For many physiotherapists (67.44%, n=175), their working hours were reduced. During the pandemic, 88.50%(n=231) of physiotherapists did use digital methods for consultation. Among 231 physiotherapists who adopted the digital methods, 41.55%(n=96) did consultation via telephone, while 48.91%(113) used both telephonic and video conferencing medium for the same, and the rest of 9.52%(n=22) used all sorts of digital methods along with printed booklets in which exercises with diagrams were mentioned. Every physiotherapist (100%, n=261) used precautionary measures in the clinic to stop the spreading of Covid-19.

Table 3.5. The consequence of the Covid-19 on private clinic practices

Variables	Category	Frequency (N=261)	Percent(100%)
Impact on professional practices	Yes	261	100%
	No	0	0
Covid-19 pandemic affected the facility	Complete closure	9	3.46%
	Reduced working hours	38	15.39%
	Both complete closure and reduced	211	81.15%

	working hours		
Impact of the pandemic on the number of patients (March to July)	Patient flow same as before the pandemic situation	0	
	Patient flow decreased as before the pandemic situation	41	15.70%
	Complete close or close for some months	220	84.30%
Impact of the pandemic on the number of patients (August to December)	Patient flow same as before the pandemic situation	27	10.34%
	Patient flow decreased as before the	230	88.12%

	pandemic situation		
	Complete closure	4	1.54%
The reasons for the facility closure	mandatory order from the government and Insufficient safety precaution	236	91.12%
	Patients were unwilling to come to the clinic and can access the Telehealth	23	8.88%
Covid-19 pandemic results in a reduction in income	Yes	261	100%
	No	0	0
Revenue loss as compared to before the pandemic	75-100%	71	27.20%
	50-75%	115	44.06%
	25-50%	54	20.68%

	0-25%	21	8.04%
Able to pay the essential bills at the time of the Covid 19 pandemic	Yes	173	63.53%
	No	3	0.78%
	Not relevant	85	32.69%
How do you manage to pay the essential bills (N=173)	Loans	21	12.14%
	Savings	152	87.86%
Increase the treatment fees after the clinic open	Yes	172	65.90%
	No	59	22.60%
	Not relevant	30	11.50%
The effect of the pandemic on working hours	Working hours remain the same	85	32.56%
	Working hours decrease	175	67.44%
Monitor the patient remotely	Yes	231	88.50%
	No	30	11.50%
Methodes(N=231)	By phone	96	41.56%
	Video conference and by phone	113	48.92%

	Video conference, Printed booklet and by phone	22	9.52%
The measures are taken for the prevention of the Covid-19 at the clinic	Yes	261	100%
	No	0	0

3.2.3. Results for the consequence of the Covid-19 on Government hospital Practices

Table 3.6 shows the results of the consequence of the Covid-19 pandemic on physiotherapists who were practising in government hospitals. Most physiotherapists(91.30%, n=105) had treated the patients in the outpatient department of physiotherapy at the time of the pandemic. Among these only 8.70% (n=10) of physiotherapists have not seen patients in the outpatient department, as they were doing Covid-19 related administrative paperwork like the Covid helpline teleconsultation center of the government of Odisha. Half of the physiotherapists (43.47%, n=50) gave the response that their professional practice satisfaction was reasonable, 30.43% (n=35) responded that their professional practice satisfaction was better, 20.86%(n=24) responded that their professional practice satisfaction was best, and only 5.24% (n=6) responded that their professional satisfaction was worst at the time of the pandemic. The majority, 86.96% (n=100) of physiotherapists did not get proper personal protective equipment kits from the government of Odisha. The government of Odisha did not

provide any life insurance to the physiotherapists who were practising in the government hospital.

Table 3.6. The consequence of the Covid-19 on Government hospital Practices

Variables	Category	Frequency (N=115)	Percent(100%)
Outpatient department open at the time of the pandemic	Yes	105	91.30%
	No	10	8.70%
Satisfaction with the current professional practice	Worst	0	0
	Bad	6	5.24%
	Good	50	43.47%
	Better	35	30.43%
	Best	24	20.86%
The government provide you proper PPE kit	Yes	15	13.04%
	No	100	86.96%
Any life insurance from the government of Odisha for Covid-19	Yes	0	0
	No	115	100%

3.2.4. Results for the consequence of the Covid-19 on Private hospital Practices

Table 3.7 shows the results of the consequence of the Covid-19 on physiotherapists who were practising in private hospitals. Most physiotherapists in this category (97.83%,n=45) had treated the patients in the outpatient department of physiotherapy at the time of the pandemic. And most of them (97.83%, n=45) were treating acute post-operative patients at the time of the pandemic. Out of 46 physiotherapists, 32.61%(n=15) gave the response that their professional practice satisfaction was best, 30.43% (n=14) responded that their professional practice satisfaction was reasonable, 13.04%(n=6) responded that their professional practice satisfaction was better, and only 23.92% (n=11) responded that their professional satisfaction was worst at the time of the pandemic. 76.08% of physiotherapists got proper PPE kits from the hospital management. Only 10.87%(n=5) of physiotherapists got life insurance for COVD-19 as their hospital management provided.

Table 3.7. The consequence of the Covid-19 on Private hospital Practices

Variables	**Category**	**Frequency(N=46)**	**Percent(100%)**
Outpatient department open at the time of the pandemic	Yes	45	97.83%
	No	1	2.17%
Treat acute patients at the time of the pandemic	Yes	45	97.83%
	No	1	2.17%
Satisfaction with the current professional practice	Worst	0	0
	Bad	11	23.92%
	Good	14	30.43%

	Better	6	13.04%
	Best	15	32.61%
The hospital management provide you proper PPE kit	Yes	35	76.08%
	No	11	23.91%
Any life insurance from the hospital management for Covid-19	Yes	5	10.87%
	No	41	89.13%

3.3. Results for the anxiety status and coping mechanism of the physiotherapist

Table 3.8 shows the anxiety status of the physiotherapists at the time of the Covid-19 pandemic. Physiotherapists were also working as frontline workers during the covid-19 pandemic. They also come in direct contact with Covid while treating patients. Out of the 411 physiotherapists, 83.65%(n=343) had anxiety/fear about the transmission of Covid-19 to them and their family members because of their practice.

Table 3.8. The anxiety status of physiotherapists at the time of the Covid-19 pandemic

Variables	Category	Frequency(N=411)	Percent(100%)
Fear/ anxiety about the transmission of Covid-19 to you and family members because of your practice	Yes	343	83.66%
	No	68	16.34%

Table 3.9 shows how e physiotherapists had coped up with the Covid -19 situation. Out of 343 physiotherapists, 141 had taken the proper precaution to overcome the fear and anxiety. The rest of the 44 physiotherapists had taken proper precautions, motivating themselves and motivated by their family members to overcome the anxiety.

Table 3.9. The copping mechanism of the physiotherapists to overcome anxiety

Variables	**Catagory**	**Frequency(N=343)**	**Percent(100%)**
The coping strategies to overcome anxiety	By taking proper precautions	141	41.11%
	By taking proper precautions and by motivating ownself	158	46.06%
	By taking proper precautions and by motivating ownself, by motivating ownself and Motivation by family members	44	12.83%

3.4. Comparison of %change in patients seen per day with co-variates-I

Table3.10. Comparison of % change in patients seen per day with Sex of the physiotherapist

Sex of the physiotherapist	Minimum	Maximum	Mean of % change in patient flow	Standard deviation	P-value
Male	22	200	77.5	24	
Female	25	200	81.6	31	**0.1732**

Table3.9 shows the comparison of % change in patient flow per day and sex-wise practice of physiotherapists in Odisha. An unpaired t-test was done. The minimum % change in patient flow per day to male physiotherapist 22. The maximum % change in patient flow per day to male physiotherapist was 200. The mean % change in patient flow per day in the case of male physiotherapists was 77.5. The minimum % change in patient flow per day to female physiotherapist 25. The maximum % change in patient flow per day to female physiotherapist was 200. The mean % change in patient flow per day in the case of female physiotherapists was 81.6. The P-vale is coming 0.1732 which is showing the test is not significant.

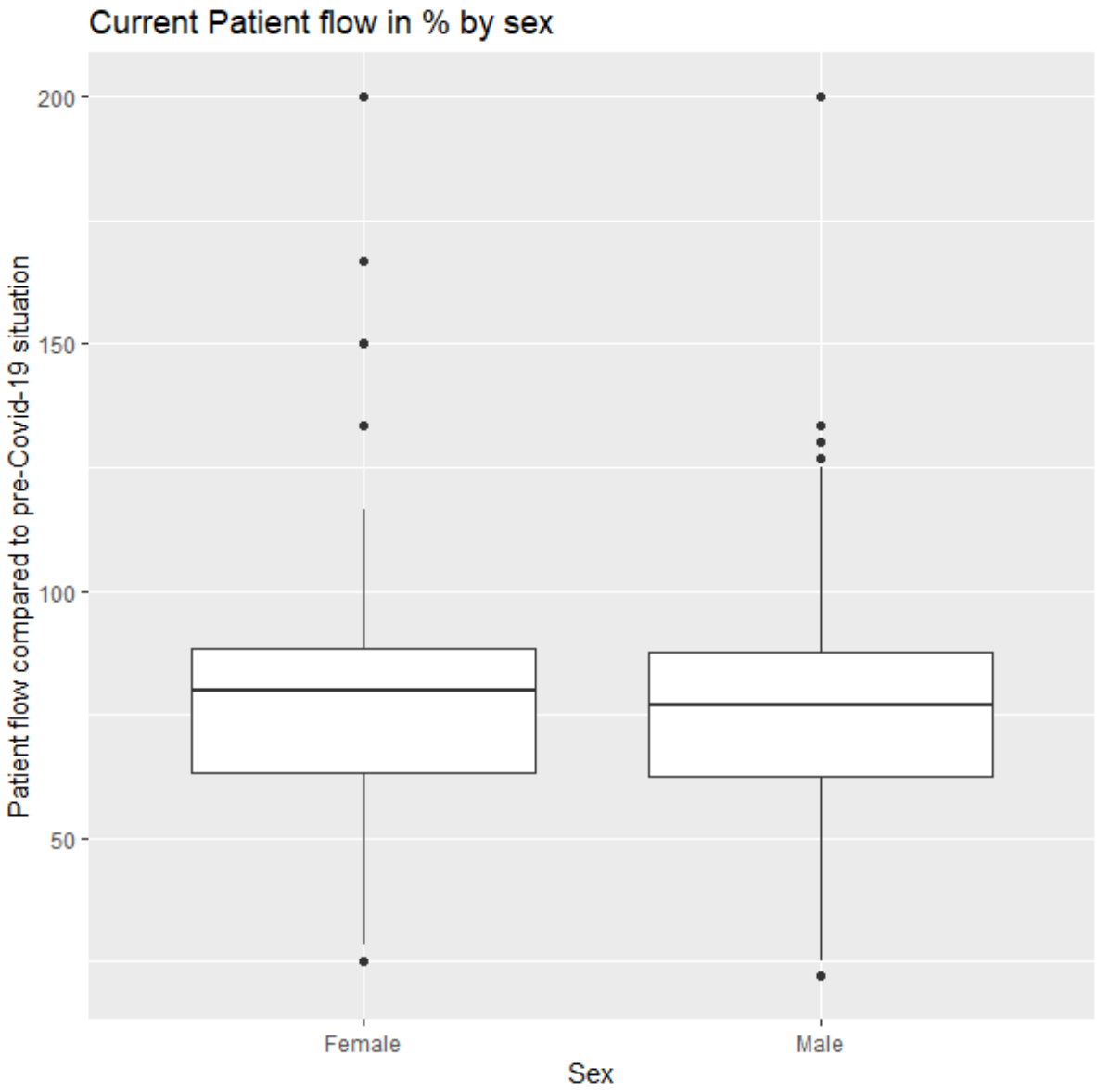

Figure 3.1. Box plot between sex of the physiotherapist and percentage of the flow of patients compared to the pre-Covid situation

Figure 3.1, box plot shows data about the current patient flow in percentage by distribution with sex. X-axis shows the sex of the physiotherapists(Male or female), and the Y-axis shows the percentage change in patient flow compared to the pre-covid-19 situation. There are five outliers in the female physiotherapist group. The maximum range is 200, and the minimum range is 25. The Median is 80. The first quartile is 63.29, and the third quartile

is 88.22. There are five outliers in the male physiotherapist group. The minimum range is 22.22, and the maximum range is 200. The median is 76.92. The first quartile range is 62.50, and the third quartile is 87.50.

3.4.1. Comparison of %change in patients seen per day with co-variates-II

Table.3.11 Comparision of % change in patients seen per day with the primary mode of practice

The primary mode of practice	Minimum	Maximum	Mean of % change in patient flow	Standard deviation	P-value
Hospital	25	200	88	33	
Private Clinic	22	200	73	19	<0.0001

Table 3.10 shows the comparison of % change in patients seen per day with the primary mode of practice. The unpaired t-test was done. The minimum % change in patient flow per day in the hospital was 25. The maximum % change in patient flow per day in the hospital was 200. The mean % change in patient flow per day in hospitals was 88. The minimum % change in patient flow per day in the private clinic was 22. The maximum % change in patient flow per day in the private clinic was 200. The mean % change in patient flow per day in the private clinic was73. The P-vale is coming <0.0001 which is showing the test is significant. The test results show that the % change in inpatient flow per day was more in hospitals as compared to private clinics after the Covid situation.

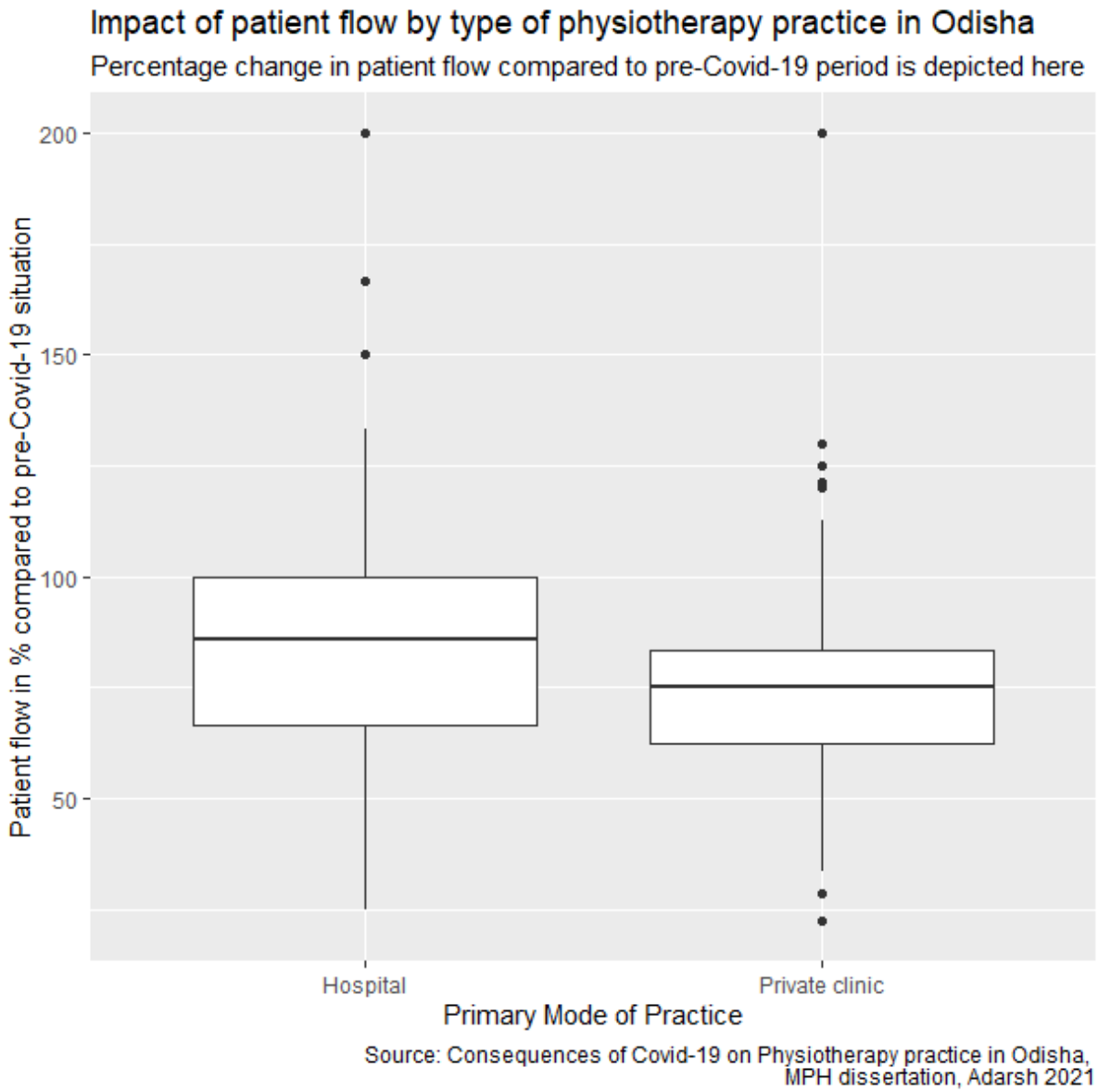

Figure 3.2. Impact of patient flow by type of physiotherapy practice in Odisha

Figure 3.2 shows the data about the percentage change in patient flow compared to the pre-Covid situation in hospitals and private clinics. The X-axis shows the Primary mode of Practice (Hospital or Private clinic), and the Y-axis shows patient flow in percentage compared to the pre-Covid situation. There are three outliers in the Hospital group. The maximum range is 200, and the minimum range is 25. The Median is 85.71. The first quartile is 66.67, and the third quartile is 100. There are seven outliers in the private clinic group. The maximum range is 200, and the minimum range is 22.22. The Median is 75.

The first quartile is 62.50, and the third quartile is 83.33. The above boxplot shows that when we compare the patient flow to the pre-Covid-period, the percentage of patient flow decreases in a private clinic compared to the hospital.

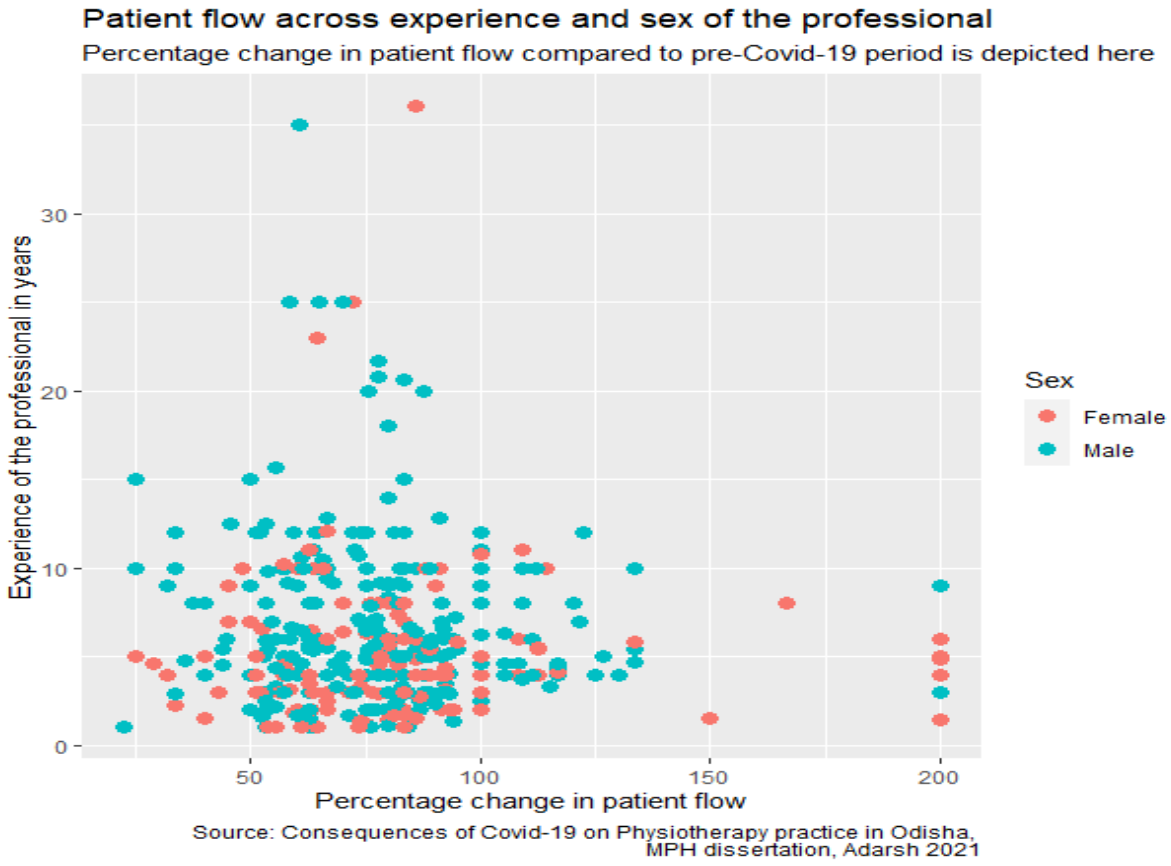

Figure 3.3. Patient flow across experience and sex of the professional

Figure 3.3 plot showing the data of patient flow across experience and sex of the professional. The X-axis shows the data of percentage change in patient flow in the above scatter plot, and the Y-axis shows the professional experience in years. The above scatter plot is about patient flow across the experience and sex of the professionals. Female has

more patient flow as compared to male with less experience. Maximum patient flows shown between 50 to 100 per cent and with the experienced group of 0-10 years.

3.5. Geospatial distribution of patient flow compared to the pre-Covid-19 period in Odisha

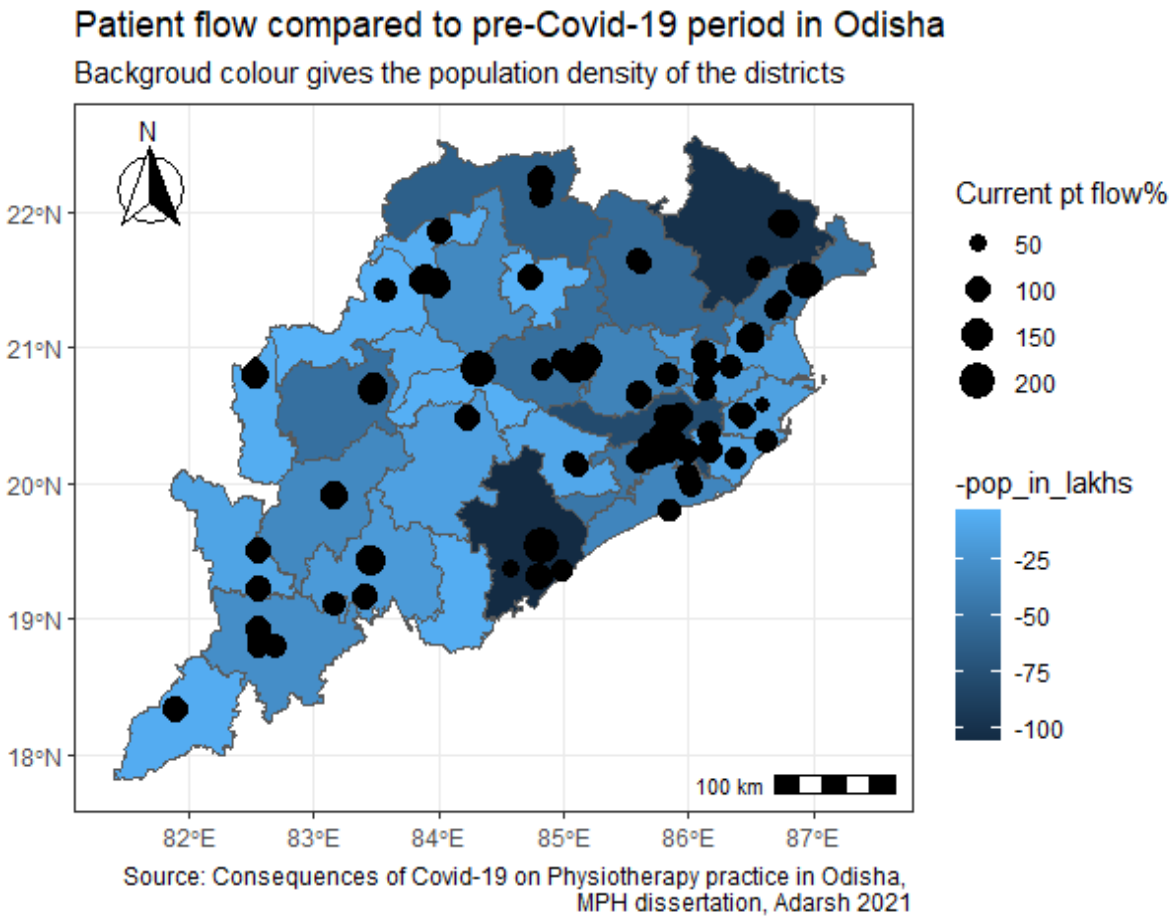

Figure 3.4. % change in patients seen per day compared to Pre-Covid-19 period in Odisha

Figure 3.4 is the choropleth map of Odisha. The point shows the % change in patients seen per day to locations of physiotherapy facilities. As the dark dot size increases, the percentage of patient flow to the facility increases compared to the pre-Covid-19 period. The background colour of the map is shown the population in lakhs. As the background colour darkens, the population density is more in those districts and as the background colour lightens, population density is less in those districts. This map shows that as the population density increases in districts, the flow of patients is more in those areas. In predominantly rural districts, the number of physiotherapy facilities is less as the population density also less in these districts. In those districts with only a few physiotherapy facilities, the flow of patients were not much affected.

3.6. Geospatial distribution of location and types of physiotherapy practices in Odisha

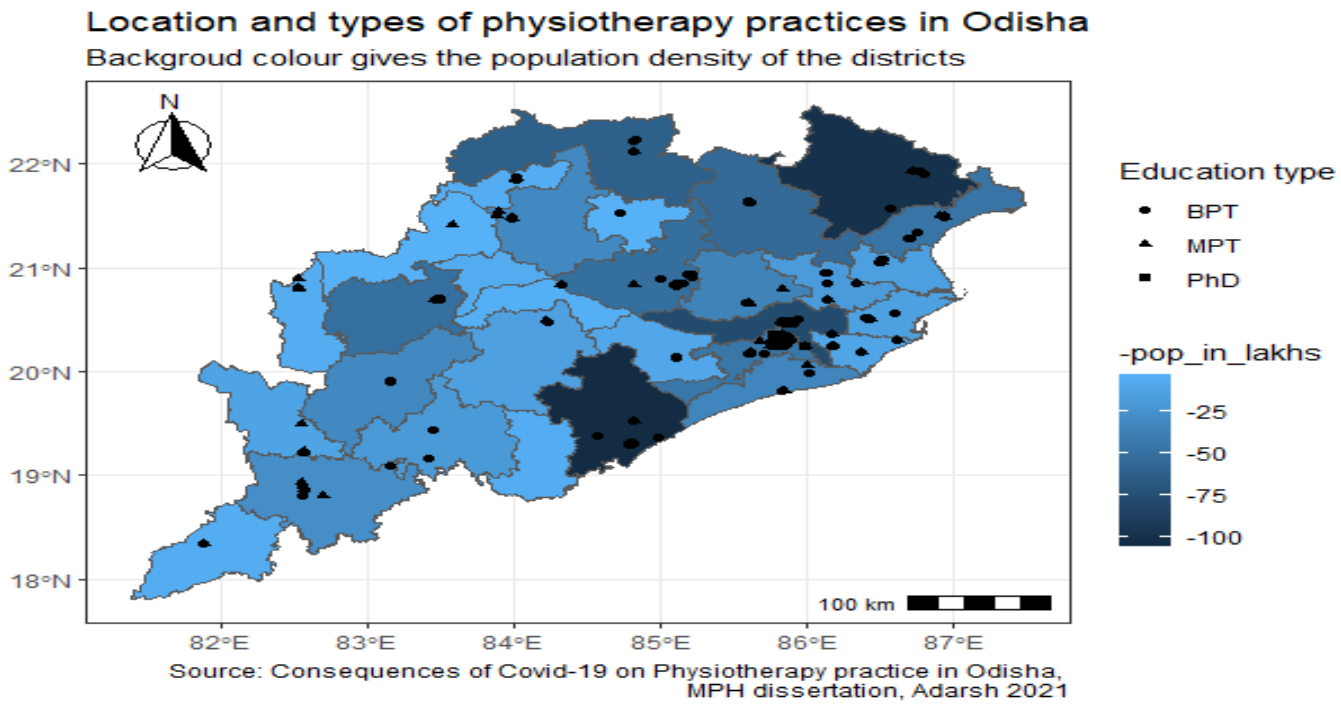

Figure3.5. Location and types of physiotherapy practices in Odisha

Figure 3.5 is the choropleth map of Odisha. The dot point shows the physiotherapy facilities where the highest qualifications of the physiotherapists are BPT, while the triangle point shows the physiotherapy facilities where the highest qualification of the physiotherapists are MPT. The square point shows the physiotherapy facilities where the highest qualifications of the physiotherapists are PhD. The background colour of the map is shown the population in lakhs. As the background colour darkens, the population density in those districts are more and as the background colour lightens, the population density in those districts are less. This map shows that as the population density is more in districts, the more qualified physiotherapists are practising in those areas. Few numbers physiotherapists are practising in predominantly rural districts as compared to predominantly urban districts.

CHAPTER 4- DISCUSSION

The first objective of the study was to understand the profile and distribution of physiotherapists and physiotherapy facilities across Odisha. The above study shows that the ratio of the physiotherapist to population is approximately 1:1,00,000 in Odisha. As per the WHO, the ratio of the physiotherapist to population should be 1:10,000. In Odisha, the ratio is not maintained as per the WHO guidelines (world health organization, 2011). The maximum number of physiotherapy facilities were seen in the cities of Odisha, which was previously found in the study done in Brazil. The maximum number of physiotherapy facilities were found in metropolitan cities of Brazil (Costa, 2012). Only a few physiotherapists are practising in the rural areas in Odisha, which was also found in Nigeria, where very few physiotherapists were practising in rural areas (Mbada C *et al.*, 2019). According to the geographic analysis, the supply of physiotherapy facilities as per population needs is unequally distributed in Odisha. Acute physiotherapy facilities were more unequally distributed across Odisha. Maximum physiotherapy facilities are offering non-acute services. Those who are providing acute facilities also provide non-acute facilities. The geospatial analysis shows that maximum physiotherapy facilities are in the urban and highly populated areas, especially within the capital city of Odisha.

In contrast, there were fewer physiotherapy facilities in the rural parts of Odisha. The same pattern was also found in the study done in Ireland (Eighan J *et al.*, 2019). The geospatial analysis mapping shows that the physiotherapy facilities are clustered in certain parts of the districts in Odisha. One previous study also shows that in Canada, the physiotherapy facilities were clustered in certain parts of the cities (Shah T *et al.*, 2019).

The second objective of the study was to study the consequence of Covid-19 on physiotherapy practice in Odisha. The above study shows a significant revenue loss among

the physiotherapists who were practising in the private clinic due to a decrease in the number of patients seen per day compared to before the pandemic. However, the physiotherapists working in government and the private hospitals got their salaries from the government or the private hospital management respectively, so there was no loss in revenue. Hospital settings(most of the hospitals were under the public sector) had no considerable change in patient flow, but the private clinics had a considerable decrease inpatient flow than before the Covid-19 pandemic. In a study in the United States of America, the physicians and dentists had faced the same problem as the physiotherapists were facing in Odisha during the Covid-19 pandemic (Ferneini, 2020). In the above study, all physiotherapy practitioners used precautionary measures to stop the spread of Covid-19 from patients to them and others at the clinic. The patients were also not comfortable coming to facilities at the time of the pandemic due to the fear of getting the infection. So, most physiotherapists opted to treat patients remotely, using teleconsultation facilities. Most of them used telephonic and video conferencing modes as a treatment option for those who needed physiotherapy compulsorily during the pandemic. Similar trends were also found in the study done in Portugal (Alpalhão and Alpalhão, 2020), India (Srivastav, Sharma and Samuel, 2020) and Australia (Haines and Berney, 2020). Physiotherapists in Odisha who were working in the government hospitals posted to Covid related administrative paperwork and Covid teleconsultation at the time of the pandemic. A study done in Australia found that physiotherapists working in hospitals set up were appointed in the Covid-19 ward along with their regular duty (Haines and Berney, 2020).

Most of the physiotherapists were having anxiety as they were also front line workers in the pandemic management. They were concerned about the transmission of Covid-19 to themselves or their family members because of their practice. A meta-analysis was undertaken by Pappa *et al.* to know the impact of the Covid-19 pandemic on health

care workers, which shows that most of the health care workers had mental health problems like fear, anxiety, depression and insomnia at the time of the pandemic (Pappa *et al.*, 2020).

The physiotherapists who were practising in Odisha coped up with their anxiety and fear by taking necessary precautions against Covid-19, by motivating themselves to work with the pandemic situation and by taking motivations from their family members. A study done in Australia found that those physiotherapists who had anxiety and fear did meditation for mental health and physical exercise to cope up with the situation (Haines and Berney, 2020).

As the curfew was continuing during the data collection period, most of the private clinics were shut down from March to July and private hospitals were also running with low non-Covid patients. At that time those physiotherapists who had a valid identity card could go for a house visit, which maintained their income. But in Portugal, as the curfew was strict and the numbers of people suffering were more so to avoid the spread of infection physiotherapists shifted their passive treatment session to online session(Alpalhão and Alpalhão, 2020).

4.1. Strengths and limitations

4.1.1 Strengths

a. There is no inter-observer bias in the results because the principal investigator himself has done all the telephonic interviews with physiotherapists.

b. The response rate is 81.1 per cent, which is a fair response rate in telephonic interviews.

c. This is the first study in India for profiling physiotherapy facilities and the consequences of the Covid-19 pandemic on physiotherapy practice in a state.

4.1.2 Limitations

As there is no physiotherapy council in Odisha, there is no government record on the number of physiotherapists practising in Odisha. Some of the physiotherapists practising in Odisha could be missed in the study if they were not registered with the Indian Association of Physiotherapists(IAP), which is not mandatory.

4.2. Conclusion

The physiotherapy facilities and physiotherapists are unequally distributed across the state of Odisha. The Covid-19 affected the physiotherapists in terms of loss of revenue and a decrease in the number of patients seen per day compared to the pre-Covid-19 situation. Most of the physiotherapists were anxious or afraid of the spread of Covid-19 to them or their family members because of their practice.

4.3 Implication of the study

This study reveals that there were fewer physiotherapy facilities in the rural parts of Odisha. Government should facilitate to open more physiotherapy facilities in the rural areas. Patients are not coming for physiotherapy treatment, either due to lack of awareness about physiotherapy or due to inadequate referrals from the health system. Having a council for physiotherapy practitioners at the governmental level will help in having a registry of the practising physiotherapists in the state. The researcher had come across many unqualified practitioners during the study, which could be avoided by establishing a council at the government level.

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Appendix-I

PARTICIPANT INFORMATION SHEET

My name is Mr Adarsha Brahma and I am a student of Masters of Public Health (MPH) at AMCHSS, SCTIMST, Trivandrum, Kerala. I am proposing to do my MPH dissertation on

" PROFILING OF PHYSIOTHERAPY FACILITIES AND CONSEQUENCES OF COVID-19 PANDEMIC ON PHYSIOTHERAPY PRACTICE IN ODISHA IN 2020".The study aims to understand the profile and distribution of physiotherapy practices in Odisha in 2020. The location of your practice/institution will be collected for the creation of thematic maps and spatial analysis to explore the distribution of physiotherapy practices in Odisha.

If you agree to participate in the study, I would ask questions related to your location of professional physiotherapy practice, what is the consequences of the COVID 19 pandemic on your practice and how you cope with the situation. The questions would be asked to you in private by telephone or you can fill by yourself on the online form as per your wish. Answering these questions will take about 20 minutes of your time. Your participation is voluntary. No compensation will be paid to you for participating in this study. You can also opt not to take part. You can choose not to answer a particular question at any time without giving any reason. Your rights to professional practice not be affected by it. The collected information will be between you, me and my guide Dr Biju soman, Professor, AMCHSS. Your name won't be disclosed. Only I will know the name and keep it confidentially. The name will be destroyed as the dissertation is over.

If you have any doubt regarding the research, you can contact me on my number 7992774144 and Email id- adarshbrahma1995@gmail.com or Dr Mala Ramanathan, IEC Member-secretary, at the number -0471-2524234 and email id- diec.mem.sec@sctimst.ac.in.

If you are agreeing to participate, we will proceed now.

Signature: Name of the interviewer

Mr Adarsha Brahma

Date: 07/ 10/ 2020

Contact number: 7992774144 Email id- adarshbrahma1995@gmail.com

Appendix-II

CERTIFICATE OF CONSENT

I have heard all the provided information and I understand the content of the information sheet. I have had the opportunity to clear my doubts about it and I have been answered the questions to my satisfaction. I voluntarily give my consent to participate in the study "PROFILING OF PHYSIOTHERAPY FACILITIES AND CONSEQUENCES OF COVID19 PANDEMIC ON PHYSIOTHERAPY PRACTICE IN 2020 IN ODISHA". and I understand that I have the right to withdraw from the study at any time. I give my consent to share the contents of the interview with the guide.

Name of the interviewer

Mr Adarsha Brahma

Signature of the interviewer

Name of the study participant

Appendix-III

1	Form Id	
2	Name of the physiotherapist	
3	Sex of the physiotherapist	Select One 1- Male 2- Female 3- Others
4	What is the highest qualification of the physiotherapist?	Select one 1- BPT 2- MPT 3- PhD 4- Other(specify____)
5	Address of the physiotherapy facility (Clinic) 5.a. District 5.b. Taluk /block 5.c.Panchayat /municipalities Street House id	

	Nearest Landmark (e.g.: school, hospital, office, nearest junction, etc.)) Pin code	
5.1	Address of the physiotherapy facility (Hospital) 5.1.a. District 5.1.b. Taluk /block 5.1.c. Panchayat /municipalities Street House id Nearest Landmark (e.g.: school, hospital, office, nearest junction, etc.)) Pin code	
6	Select the location of the practice	Select one 1- Rural 2- Urban
7	Where are you practising? **(instructions- Please fillup the sections from A, B, C, D from below as per your setting in which you practice and skips the others for measure the impact of COVID 19 on your Practice.)**	Select Multiple 1- Home visit 2- Private clinic 3- Government Hospital

		4- Private Hospital
8	If clinic then what is your position in the Physiotherapy clinic?	Select One 1- Owner 2- Co-owner 3- Staff
8.1	If a hospital, then specifies the type of hospital?	Select one 1- Government 2- Private
8.2	Which type of clinical setting are you working in?	Select multiple 1- Acute (Indoor, Hospitalized post-surgical physiotherapy) 2- Non-acute (Outdoor, chronic and rehabilitation physiotherapy)
8.3	What is your primary mode of practice?	Select multiple 1- Private clinic 2- Home visit 3- Hospital

8.4	If the private clinic, then what type of clinical setting are you providing?	Select multiple 1- Acute (Indoor, Hospitalize post-surgical physiotherapy)) 2- Non-acute (Outdoor, chronic and rehabilitation physiotherapy)
8.5	How many physiotherapists are practising in your clinic?	
9	How long you have been practising physiotherapy? (Duration in months)	
9.1	How long you have been practising physiotherapy in this locality? (Duration in months)	
9.2	How far from away are patients coming to your clinic?	
10	If home visit, then how far away do you go for a home visit?	
11	What are types of treatment are you providing in the clinic?	Select multiple 1- Manual therapy 2- Electrotherapy
12	If electrotherapy, what are the services are you providing?	Select multiple 1- Electrotherapy basic (eg- Faradic, galvanic, tens, traction)

		2- Electrotherapy advance(Shortwave diathermy, long-wave, advanced manipulation bed, etc)
13	For the last how many years are you practising physiotherapy?	
Section A- House visit **CONSEQUENCES OF COVID-19 ON PHYSIOTHERAPY PRACTICE**		
1	Is there an impact of the COVID-19 pandemic on your professional practices?	Select one 1- Yes 2- No
2	If yes, then how has the COVID-19 pandemic affected your professional practices?	Select multiple 1- Income 2- Number of patients 3- Others (Specify_____)
2.1	What is the impact of the pandemic on the number of patients? (From March to July)	Select one 1- Patient flow same as before the pandemic situation

		2- Patient flow decreased as compared to that before the pandemic situation
2.1.1	What is the impact of the pandemic on the number of patients? (From August to December)	Select one 1- Patient flow same as before the pandemic situation 2- Patient flow decreased as compared to that before the pandemic situation
2.2	Did the COVID-19 pandemic result in a reduction in your income?	Select one 1- Yes 2- No
2.2.1	If yes, what percentage of revenue did you lose at the time of the pandemic as compared to that before the pandemic?	1- 0-25% 2- 25-50% 3- 50-75% 4- 75-100%
2.2.2	Did you start more home visits after the onset of COVID-19 to compensate for the loss of income?	Select one 1- Yes 2- No

3	Did you have the fear/ anxiety about the transmission of COVID-19 to you and your family members because of your practice?	Select one 1-Yes 2-No
3.1	If yes then, how did you overcome the fear/anxiety?	Select multiple 1-By motivating oneself 2-By taking proper precautions 3-Motivation by family members 4-Other (specify_____)
Section B- Private clinic **CONSEQUENCES OF COVID-19 ON PHYSIOTHERAPY PRACTICE**		
1	Did the pandemic affect your service?	Select one 1- Yes 2- No
1.1	If yes then how?	Select multiple 1- Complete closure (Mention how many month_____) 2- Reduced working hours 3- Open only a few days a week

		4- Others (Specify_____)
1.2	What was the impact of the pandemic on the number of patients? (From March to July)	Select one 1- Number of patients the same as before the pandemic situation 2- The number of patients decreased as compared to that before the pandemic situation
1.3	What was the impact of the pandemic on the number of patients? (From August to December)	Select one 1- Number of patients the same as before the pandemic situation 2- The number of patients decreased as compared to that before the pandemic situation
1.4	If the pandemic interrupts in the practice, then what were the reasons for the facility closure?	Select multiple 1- Insufficient safety precaution such as

		personal protection equipment (PPE) kit or space for physical distance 2- Mandatory order from the government 3- Patients are unwilling to come to the clinic and can access the Telehealth 4- Insufficient staffing 5- Other (specify_____)
2	Did the COVID-19 pandemic result in a reduction in your income?	Select one 1-Yes 2-No
2.1	If yes, what percentage of revenue did you lose at the time of the pandemic as compared to that before the pandemic?	1- 0-25% 2- 25-50% 3- 50-75% 4- 75-100%
3	Did you able to pay the essential bills at the time of the COVID 19 pandemic? (Bills- House rent, Electricity, Professional tax, salary to the staffs, etc.)	Select one 1- Yes 2- No 3- Not relevant

3.1	If yes, how do you pay the essential bills and payments?	Select multiple 1- Loans 2- Savings 3- Selling property 4- Other(specify_____)
4	Did you reduce the human resource at the time of the pandemic to adjust the financial situation?	Select one 1- Yes 2- No
4.1	If yes, then mention the type?	Select multiple 1- Laid off staff 2- Resigned staff 3- Leave 4- stopped from further employment 5- made part-time for staff 6- None of the above 7- Other (specify_____)
5	Did you increase the treatment fees after the clinic open?	Select one 1- Yes 2- No

6	How did the pandemic affect your working hours?	Select one 1- Working hours increase 2- Working hours decrease 3- Working hours remain the same
7	Did you monitor the patient remotely?	Select one 1- Yes 2- No
7.1	If yes, then how?	Select multiple 1- Video conference 2- Printed booklet 3- By phone 4- Other(specify_____)
8	Did you take measures for the prevention of the COVID-19 at the clinic?	Select one 1- Yes 2- No
8.1	Select the measures taken for the prevention of the COVID-19 at the clinic?	Select multiple 1- Hand washing between every patient 2- Dis-infect the physiotherapy equipment between every patient

		3- Mask use 4- Glove use 5- Keeping distance 6- Reduction on the number of patients 7- Team switching 8- Request to change the patient's cloth 9- Other measures (Specify_____)
9	Did you have the fear/ anxiety about the transmission of COVID-19 to you and your family members because of your practice?	Select one 1- Yes 2- No
9.1	If yes then, how did you overcome the fear/anxiety?	Select multiple 1- By motivating oneself 2- By taking proper precautions 3- Motivation by family members 4- Other (specify_____)

Section C- For physiotherapists in government facilities **CONSEQUENCES OF COVID-19 ON THE GOVERNMENT HOSPITAL PHYSIOTHERAPIST**		
1	Did your outpatient department open at the time of the pandemic?	Select one 1- Yes 2- No
1.1	If no, then where did you do your duty at the time of the pandemic?	
2	To what extent are you satisfied with the current professional practice? Rate from 1 to 5 (1-Worse, 2-Bad, 3-Good, 4-Better, 5-Best)	
3	Did the government provide you proper PPE kit at the time of the COVID 19 Pandemic?	Select one 1- Yes 2- No
3.1	If yes, what are the types of equipment the government provide?	Select multiple 1- Face protection 2- Goggles 3- Mask 4- Gloves 5- Gown 6- Headcover 7- Rubber boots

4	Did you have the fear/ anxiety about the transmission of COVID-19 to you and your family members because of your practice?	Select one 1- Yes 2- No
4.1	If yes then, how did you overcome the fear/anxiety?	Select multiple 1- By motivating oneself 2- By taking proper precautions 3- Motivation by family members 4- Other (specify_____)
4.2	Do you have any life insurance from the government of Odisha for COVID-19?	Select One 1- Yes 2- No
Section D- For physiotherapists in private facilities **CONSEQUENCES OF COVID-19 ON THE PRIVATE HOSPITAL PHYSIOTHERAPIST**		
1	Did your outpatient department open at the time of the pandemic?	Select one 1- Yes 2- No
1.1	If no, then where did you do your duty at the time of the pandemic?	
1.2	Did you treat acute patients at the time of the pandemic?	Select One

		1- Yes 2- No
2	To what extent are you satisfied with the current professional practice? Rate from 1 to 5 1-Wrose, 2-Bad, 3- Good, 4- Better, 5- Best	
3	Did the hospital management provide you proper PPE kit at the time of the COVID 19 pandemic?	Select one 1- Yes 2- No
3.1	If yes, what are the types of equipment the hospital management provide?	Select multiple 1- Face protection 2- Goggles 3- Mask 4- Gloves 5- Gown 6- Headcover 7- Rubber boots
4	Did you have the fear/ anxiety about the transmission of COVID-19 to you and your family members because of your practice?	Select one 1- Yes 2- No
4.1	If yes then, how did you overcome the fear/anxiety?	Select multiple 1- By motivating oneself 2- By taking proper precautions

		3- Motivation by family members 4- Other (specify_____)
4.2	Do you have any life insurance from the hospital management for COVID-19?	Select One 1- Yes 2- No