

# Physiotherapy Research in a Danish University Hospital: A Retrospective Review, 2010-2018

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## Abstract

**Background:** Research is fundamental for developing high-quality assessments and new evidence-based treatment and is an integral part of the skills base for physiotherapists, particularly at a university hospital. However, physiotherapy research remains to be assessed and promoted.

**Objective:** The objective of this study was to investigate research field and resultant publications conducted by physiotherapists in a Danish university hospital.

**Materials and methods:** Sixty-three research studies involving physiotherapists in the period 2010 to 2018 were screened for inclusion in this retrospective review.

A standard template was completed for each research study. The template includes: study title, design, manager; location, contact person, period and status.

**Results:** Thirty-three studies conducted by physiotherapists were included. Of these, 2 (6%) studies were cancelled, 10 (30%) studies were in process and 21 (64%) studies completed. The most frequent research field was neurological physiotherapy (21%), followed equally by orthopaedics physiotherapy (15%), back related physiotherapy (15%) and oncology physiotherapy (15%). The most frequent used design was randomised controlled trials (RCTs) (27%), followed equally by validity studies (15%) and systematic reviews (15%).

Twenty-five articles with a physiotherapist as first author were published in peer-reviewed journals. Of these, 20 (80%) articles were published in disease, symptom or gender specific journals while 5 (20%) articles were published in physiotherapy journals.

An additional 11 articles were published in national physiotherapy or patient-related journals which were not peer-reviewed.

**Conclusions:** The results of this study indicated that neurological physiotherapy was the most frequent research field, RCTs the most used design and 25 articles were published in peer-reviewed journals.

A standard template is recommended to obtain systematically data from research studies.

**Clinical rehabilitation impact:** This study documented for the first time that physiotherapists in a university hospital conduct and publish research as basis for high-quality assessments and new evidence-based treatment.

**Keywords:** Physiotherapy research; university hospital; template

## Introduction

Patients of all ages with motor disorders expect high-quality assessments and evidence-based treatment [1]. In university hospitals, alongside medical training and treatment of patients, research [2] is an integral part of the skills for medical professionals e.g. doctors, nurses, occupational therapists and physiotherapists.

Physiotherapists have conducted research since 1929 [3] as the basis for high-quality assessments and new evidence-based treatment. Similarly they are involved in a range of research studies led by related medical professionals, performing assessments, interventions or as co-authors [4]. Implementation of research into a discipline such as physiotherapy takes time. Physiotherapists need education and training in research, clinical expertise and support [5].

Over recent decades the characteristics of patients at university hospitals have changed, due to changes in demographics, disease complexity, technology and policy. For physiotherapists, these changes have led to more participation in the diagnostic process and less treatment for inpatients and outpatients, due to ever shorter hospital stays and the increased use of visits at the outpatient departments. For example, according to clinical guidelines for stroke patients [6], a physiotherapist or occupational therapist should assess all admitted stroke patients within

the first 24 hours of admission, seven days per week. Similarly, at the outpatient department physiotherapists play a central role performing specific assessments and drawing up individual treatment plans for e.g. patients with chronic lower back pain.

For physiotherapy services providing these plans, changes their insight into various aspects of the different medical specialities and hopefully, points to new research questions.

The first scientific poster presentation on research by physiotherapists from our university hospital was presented at the World Confederation for Physical Therapy (WCPT) Congress 1995, Washington USA. The poster reported the effect of pelvic floor muscle training in women with urinary incontinence, carried out as a non-randomised effect study. Since then, a number of studies with different designs have been conducted, especially in the last decade [7-14].

The objective of this study was to investigate research field and resultant publications conducted by physiotherapists in a Danish university hospital. As the basis for assessing progress in physiotherapy research and for documentation and promotion, data have been obtained from all research studies at this hospital involving physiotherapists, during the period 2010 to 2018.

|                    |                                       |                     |
|--------------------|---------------------------------------|---------------------|
| <b>Study title</b> |                                       |                     |
| Study design       |                                       |                     |
| Study manager      |                                       |                     |
| Study location     |                                       |                     |
| Contact person     | Name:                                 |                     |
| e-mail:            |                                       |                     |
| Study period       | Start date:                           | Estimated end date: |
| Study status       |                                       |                     |
|                    | Protocol production                   |                     |
|                    | Approvals                             |                     |
|                    | Funding                               |                     |
|                    | Data collection                       |                     |
|                    | Data analysis                         |                     |
|                    | Manuscript production and publication |                     |
|                    | Study and result presentation         |                     |
|                    | Study completed                       |                     |

**Table 1:** A standard template was completed for each research study involving physiotherapists.

## Materials and Methods

Research studies involving physiotherapists in the Department of Occupational Therapy and Physiotherapy between 2010 and 2018, were screened for inclusion in this retrospective review.

Studies carried out in the Department of Physiotherapy and Occupational Therapy, Glostrup, Copenhagen University Hospital were screened from 2010 and for a hospital merger in 2015, they were joined by studies screened from those carried out in the Department of Occupational Therapy and Physiotherapy, Rigshospitalet, Copenhagen University Hospital.

Inclusion criteria were: a) research study conducted by a physiotherapist; b) study commenced between January 1st, 2010 and December 31, 2018 and c) study manager employed at either of the above departments.

### Template

A standard template was completed for each research study involving physiotherapists (Table 1). The template includes the following information a) title; b) design; c) manager; d) localisation; e) contact person; f) duration; g) study status divided into eight phases: protocol production; approvals; funding; data collection; data analysis; manuscript production and publication; study and results presentation, study completed.

The status of the studies was evaluated on a binary nominal scale (yes/no) and illustrated by colours: red = not started, orange = in process and green = completed (Table 1).

Twice per year, the study managers were requested to: a) update the status each of their studies; b) add new studies and c) add new publications to the publication list. The study manager was asked to respond within two weeks, after which a reminder was sent.

In her capacity as research manager for the department, the author performed the data collection, data analysis, evaluation and reporting of results, twice per year.

The reporting was carried out through, for example “The Weekly News for the Department” and “Rigshospitalet, Copenhagen University Hospital web site”.

### Statistics

Statistical analysis was carried out using IBM SPSS (Statistical Package of Social Science) version 20. Data are presented as numbers (No), percentage (%), median and interquartile range (IQR) for small samples.

## Results

### Research studies

Sixty-three research studies involving physiotherapists were screened for inclusion (Figure 1) of which 33 studies were eligible, median 2 (IQR 2-4) per year.

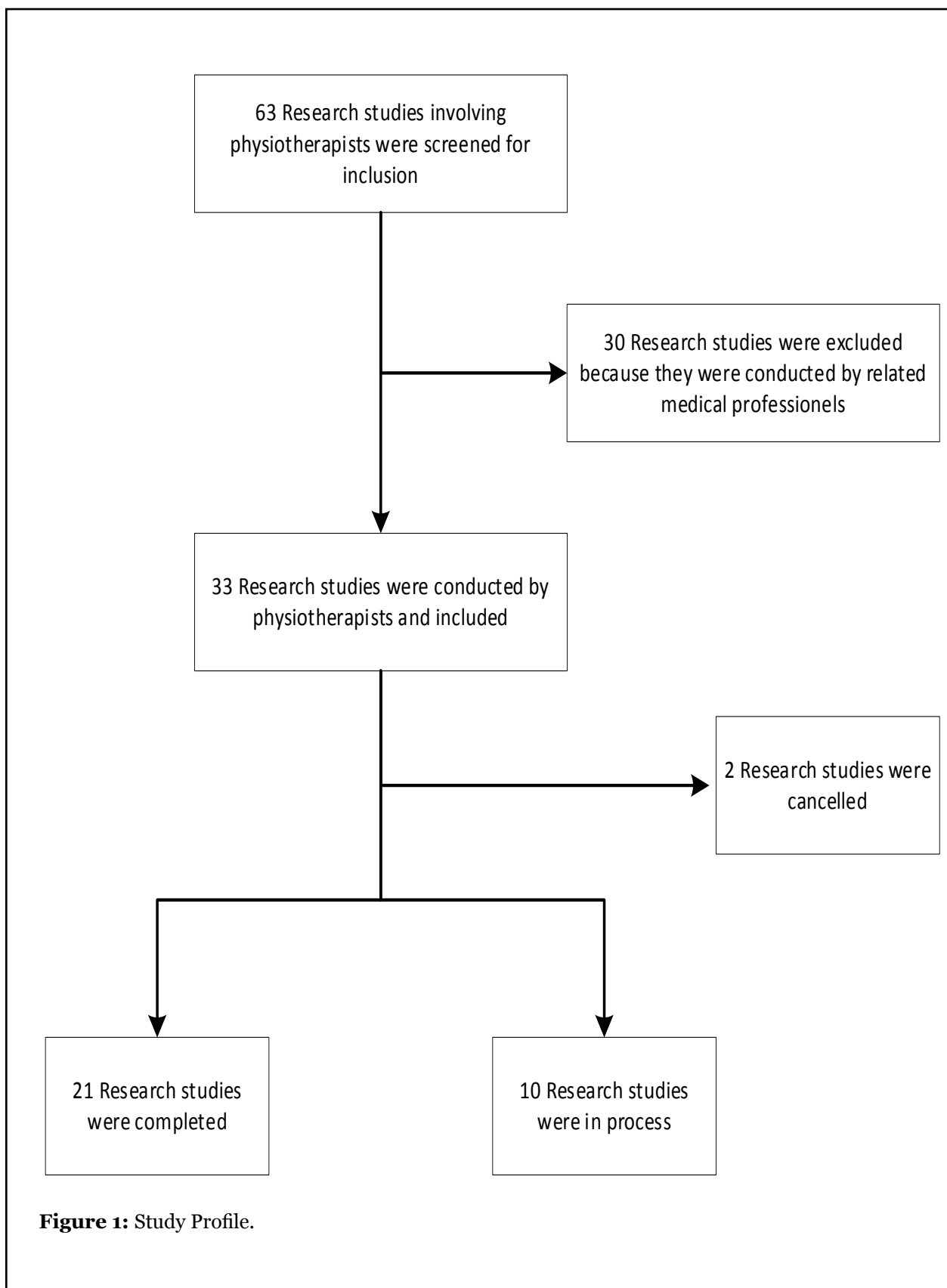
Of the 33 studies, 2 (6%) were cancelled because the manager for the studies left his job, 10 (30%) studies were in process and 21 (64%) had been completed.

### Research fields

Table 2 presents the research fields addressed which covered 10 different medicinal specialities. The most

| Research fields               | Conducted studies<br>n=33<br>No (%) | Completed studies<br>n=21<br>No (%) |
|-------------------------------|-------------------------------------|-------------------------------------|
| Neurological physiotherapy    | 7 (21)                              | 5 (24)                              |
| Orthopaedic physiotherapy     | 5 (15)                              | 4 (19)                              |
| Back related physiotherapy    | 5 (15)                              | 2 (9)                               |
| Oncology physiotherapy        | 5 (15)                              | 1 (5)                               |
| Paediatric physiotherapy      | 2 (6)                               | 2 (9)                               |
| Rheumatological physiotherapy | 3 (9)                               | 2 (9)                               |
| Cardiological physiotherapy   | 1 (3)                               | -                                   |
| Medical physiotherapy         | 3 (9)                               | 3 (14)                              |
| Gynaecological physiotherapy  | 1 (3)                               | 1 (5)                               |
| Urological physiotherapy      | 1 (3)                               | 1 (5)                               |

**Table 2:** Research fields in studies conducted and completed by physiotherapists in the period 2010 to 2018.



**Figure 1:** Study Profile.

frequent field was neurological physiotherapy (21%) followed equally by orthopaedics (15%), back related problems (15%) and oncology physiotherapy (15%).

Neurological physiotherapy was also the most frequent field for the completed studies (24%), followed by orthopaedics physiotherapy (19%).

### Research design

The design used in research studies conducted and completed are presented in Table 3. In total 10 different designs were used. The most frequent used design was RCT (27%) followed equally by validity studies (15%) and systematic reviews (15%). For the completed studies the most frequent design was again RCT (33%) as seen in Table 3.

### Publications

In total, 25 articles with a physiotherapist as first author were published in peer-reviewed international journals. The medium rate was 2 (IQR 2-3) publications per year.

Twenty (80%) articles were published in disease, symptom or gender specific journals and 5 (20%) in physiotherapy journals.

A further 11 articles were published in national physiotherapy or patent-related journals which were not

peer-reviewed.

### Discussion

The objective of this study was to investigate research field and resultant publications conducted by physiotherapists in a Danish university hospital during the period 2010 to 2018. The results indicated that neurological physiotherapy was the most frequent research field, RCTs the most used design among the 25 articles published in peer-reviewed journals. Several factors improve physiotherapy research.

### Research fields

In neurological physiotherapy a factor was the environment, regarding the study university hospital having the largest volume of neurologic patients in Denmark. Another important factor for physiotherapy research was the background of the professionals, especially doctors who participated as co-authors. Clinical issues were the most frequently addressed. In this study the neurological physiotherapy research in post-stroke patients with lower urinary tract symptoms (LUTS) [15-18] was based on 15 years of clinical experiences in gynaecological [19] and urological [20] patients with LUTS.

No research can be performed without funding. Therefore, a study manager with numerous publications in neurological physiotherapy played an important role in

| Design                | Conducted studies<br>n=33<br>N° (%) | Completed studies<br>n=21<br>N° (%) |
|-----------------------|-------------------------------------|-------------------------------------|
| Systematic review     | 5 (15)                              | 2 (9)                               |
| RCT <sup>a</sup>      | 9 (27)                              | 7 (33)                              |
| Cross sectional study | 2 (6)                               | 1 (5)                               |
| Case controlled study | 2 (6)                               | 1 (5)                               |
| Cohort study          | 2 (6)                               | -                                   |
| Validity study        | 5 (15)                              | 3 (14)                              |
| Reliability study     | 2 (6)                               | 2 (9)                               |
| Qualitative study     | 3 (9)                               | 2 (9)                               |
| Retrospective study   | 2 (6)                               | 2 (9)                               |
| Review                | 1 (3)                               | 1 (5)                               |

**Table 3:** Design used in research studies conducted and completed by physiotherapists in the period 2010 to 2018.

funding applications.

### **Orthopaedic physiotherapy**

Research into orthopaedic physiotherapy for veterans with traumatic injuries was facilitated by a political consideration. Young veterans with traumatic leg injuries attract great political attention, but a full funded Ph.D study was completed in 2018 [10,21-23] and was followed by further research.

Physiotherapy related to the back was influenced by a combination of a major organisational expansion and a local physiotherapy team seeing the needs and potentials for physiotherapy research [12, 13].

### **Oncology physiotherapy**

For oncology physiotherapy there has long been significant clinical and research knowledge [9], but with limited funding. However, oncology physiotherapy seems to be in increased focus from a perspective of quality of life in patients with cancer.

Moreover, occupational therapists at our department have already provided important research in swallowing therapy in head and neck cancer patients [24,25] and thereby facilitated research for the physiotherapists.

### **Research design**

Evidence-based physiotherapy is, according to the definitions the highest level of scientific evidence available [26,27]. In studies, we considered the physiotherapists recognised the need for data concerning reliability and validity in key parameters both subjective and objective [7,11,22]. Moreover, our results indicated that RCTs were the most frequently used design which is in line with the results based on research studies in nine physiotherapy journals between 2000 and 2007 [28].

### **Research publications**

“Where do physiotherapists prefer to publish their research? Is it in physiotherapy journals or in disease or symptom specific journals?”

Four out of five articles considered in the present study were published in disease, symptom or gender specific journals aiming to provide research findings of motor elements e.g. muscle strength and function relevant to the specific medical field.

The level of quality, assessed by the impact factor (IF), for each publication affiliated to the departments at the university hospital, was reported yearly through an obligatory Publication & Registration (PURE) database.

The production of publications did not release any bonus but if a physiotherapist has been first author in a publication, he/she may receive support as candidate for

e.g. a Ph.D study.

### **Methodological considerations**

The study has some limitations which should be noted. Representativeness is one limitation. This study was conducted in a Danish university hospital and the relevance of the findings beyond the context of the study hospital and the Danish healthcare system may be limited. However, as far as the author knows, the present study is the first to investigate physiotherapy research systematically in a university hospital.

Another limitation is the proportion of academic research education. According to the Bologna Declaration, there should be a relationship between higher education and research [29]. The first physiotherapist at our department to acquire a Ph.D did so in 2007, the second in 2018, the third started in October 2018 and the fourth just been accepted to carry out a fully-funded Ph.D programme. Unfortunately, did we not register systematically the number of physiotherapists with candidate or master's level degrees. In January 2010 in total, one physiotherapist was full time researcher at the department, and in December 2018 this was increased to two and a half full time researchers. The funding sources from the department of Occupational Therapy and Physiotherapy consisted of PC and working place facilities, but no money. A limited number of working hours per week were given for research and research administration.

In addition, two physiotherapists whose results we considered but not include in this study, acquired their Ph.Ds in the field of neurological physiotherapy [30,31] in the period 2010-2018. They were both employed at the university hospital, but not in our department.

### **Perspectives**

In aiming to achieve higher quality diagnostics and treatment of patients at university hospitals, efforts and initiatives are needed by all medical professionals. To that end, also physiotherapists have a responsibility to carry out research and contribute knowledge on the small scale and in the wider context. Therefore, physiotherapists should increase their involvement in research activities and should document and promote their research for patients and decision makers.

### **Conclusions**

The results of this study indicated that neurological physiotherapy was the most frequent research field, RCTs the most used design and that 25 articles were published in peer-reviewed international journals. An additional 11 articles were published in national physiotherapy or patient-related journals which were not peer-reviewed.

A standard template is recommended to obtain data systematically from research studies.

### Funding

This study was supported financially by the Department of Occupational Therapy and Physiotherapy, Rigshospitalet, Copenhagen University Hospital.

### Conflict of Interest

The author reports no conflicts of interest. The author alone is responsible for the content and the writing of the paper.

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