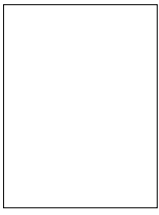


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Diagnostic Knowledge Structure
of Expert Physiotherapists
when diagnosing Low Back Pain patients

European Congress on Physiotherapy Education- Lisbon, November 2004

Diagnostic Knowledge Structure

Diagnostic Knowledge Structure of Expert Physiotherapists when diagnosing Low Back Pain patients

Eduardo Cruz

- What was the purpose of the Study?
- Why did I do this Study?
- How did I approach the Study?
- What do I hope to understand with this Study?
- How did I do to understand it?
- What were my findings?
- What does it mean?

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What was the purpose of the Study?

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The purpose of this study was to investigate how expert physiotherapists' diagnostic knowledge is structured when diagnosing low back pain patient` complaints.

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Why did I do this study?

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- To understand how expert clinicians come to represent the patient's problems.
- To understand how to develop the multidimensional knowledge base needed for understanding the patient's problems
- To understand how to facilitate the acquisition and development of expertise in undergraduate and post-graduate students

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How did I approach the Study?

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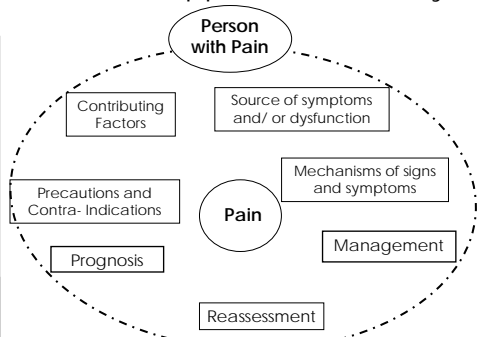
- To consider the Nature of the Problem
 - Well and Ill Structured
- To consider the nature of the tasks
 - Diagnosis and Treatment
- The considerer the Problem Solving Process
 - Static versus Dynamic
- To considerer the components
 - Cognition; Metacognition; Other Non-Cognitive Variables

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How did I approach the Study?

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Diagnostic Knowledge Structure of Expert Physiotherapists when diagnosing Low Back Pain patients

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What do I hope to understand with this Study?

Until now, there is sparse evidence about

- how the different categories are represented,
- how they are related to each other
- and mostly important how they are related with the overall representation of the patient's problem

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What do I hope to understand with this Study?

- The aim of this investigation is
- to understand how the different categories are represented in the clinician's mind,
- how each category is scrutinized by the clinician and,
- how different categories contributes to the representation of the patient's problem.

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How did I do to understand it?

- A multiple- case study design was used in this investigation.
- Case studies are the preferred research strategy when
 - "how" or "why" questions are being posed,
 - when the investigator pretends to explain the casual links in real- life interventions and to describe the real- life context in which an intervention has occurred Yin (1994, p. 1).
- Data was collected through non-participant observation (tape recorded), semi- structured interview, memos and field notes.

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How did I do to understand it?

A purposeful sample of four expert physiotherapists was selected according to the following criteria:

- N° Years of experience > 10
(Chase and Simon, 1973; Posner 1988)
- Post- graduate education in areas related with management of low back pain problems
(Payton, 1985; Thomas- Edding, 1987- Jensen, Shepard and Hack 1990; Jensen et al. 1992; King and Bithell 1998; Jensen et al. 1999)
- Participation as lecturer in postgraduate courses related to neuromusculoskeletal dysfunctions
(Thomas- Edding, 1987; Jensen, Shepard, Hack, 1990; 1992)
- Researcher's geographic convenience.

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How did I do to understand it?

- Each participant was videotaped, evaluating and treating a previously unseen patient refereed by the Medical Doctor with the diagnosis of Acute/ recurrent low back pain.
- Immediately after the session the clinician was interviewed based on what they have done during the session (recorded in video).

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How did I do to understand it?

- The clinicians reviewed the video and answered questions concerning the following aspects,
 - the reason they asked a specific question;
 - the reason that made them perform a specific test;
 - their anticipations or expectations towards the questions or tests performed;
 - their thoughts when considering a specific patient's answer and also,
 - their explanation about the patient's signs and symptoms.

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How did I do to understand it?

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- The interview was tape-recorded and then transcribed. The transcriptions included the interview data, observational data and the field notes recorded by the researcher (ex. the clinician's notes recorded in the patient's charts).

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How did I do to understand it?

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A coding framework was developed using the categories proposed by Rivett and Jones (1997) and Jones and Guifford (2002).

A thematic analysis was developed across cases in order to find similar themes, relationships and trigger words.

Flow charts of problem analysis were also produced.

Data was analysed and reported by means of a case study approach.

From these individual case studies, composite case studies were constructed.

From these a final thematic cross case comparison was performed

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How did I do to understand it?

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- The use of multiple sources of evidence
- Systematic analysis
- Review of Coding schema
- Search for Negative Evidence

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What were my findings?

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- The study finds that expert physiotherapists are flexible in the way they recognize or analyse patient's features and anticipate further clinical signs and symptoms.
- Knowledge representation was better described by the overlapping characteristics of the prototype view and by the use of the instance based framework of categorization.

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What were my findings?

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- Experience, in the sense of a repertoire of cases, could provide to the clinicians the ability to almost automatically recognize a potential category and in others there is a need for analysing each instance according to its peculiarity
- The early activation of the whole network associated with each hypothesis is different from making individual links between the information obtained from the patient to specific knowledge concepts

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What were my findings?

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- In a specific category there are acceptable and unacceptable values for each hypothesis;
- Among the acceptable values some present more evidence to confirm or reject a specific hypothesis than others.
- The accumulation of positive evidence within a working hypothesis raises the level of activation of that hypothesis, and at a particular moment the clinician decides that there is enough evidence to conclude the searching process.

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What does it means?

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- The way categories are represented in the clinicians mind (prototypes or instances) seems to have a major impact in the activation of the preliminary diagnostic hypothesis.

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What does it means?

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- Some literature suggests that categories are easily learned when the initial exposure is throughout representative examples, the prototypes.
- Others reveal the challenge in developing experience through the use of case examples.

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Thank You

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How did I approach the Study?

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```

graph TD
    A[The Nature of the Problem] --> B[Well-Structured Problems]
    A --> C[Ill-Structured Problems]
    B --> D[The Nature of the Problem Solving Process]
    C --> E[The Nature of the Problem Solving Process]
    D --> F[The Components of the Problem Solving process]
    E --> G[The Components of the Problem Solving process]
    
```

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Knowledge Organization Model

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```

graph TD
    CF[Contributing Factors] --> SS[Source of symptoms and/or dysfunction]
    CF --> MS[Mechanisms of signs and symptoms]
    SS --> MS
    MS --> P((Pain))
    MS --> PCI[Precautions and Contra-Indications]
    P --> M[Management]
    PCI --> M
    M --> R[Reassessment]
    M --> PR[Prognosis]
    
```

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What were my findings?

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```

graph TD
    subgraph Oval [ ]
        SS[Source of symptoms and/or dysfunction]
        CF[Contributing Factors]
        PM[Pathophysiological Mechanisms]
        P((Pain))
    end
    P --> PR[Prognosis]
    P --> M[Management]
    P --> R[Reassessment]
    P --> PCI[Precautions and Contra-Indications]
    
```

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