PATIENT-RELATED AND OBJECTIVE CLINICAL FACTORS THAT INFLUENCE DIAGNOSTIC AGREEMENT BETWEEN A PHYSIOTHERAPIST AND PHYSICIANS FOR PATIENTS SUFFERING FROM MUSCULOSKELETAL KNEE DISORDERS

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INTRODUCTION

Diagnostic errors may lead to **inadequate and delayed treatment**.

It is clinically accepted that **certain patient-related and objective clinical characteristics** (PROCCs), like those related to the anamnesis or physical assessment, **may reduce diagnostic validity**.

However, **these characteristics have not been formally identified in the literature**.

MAIN OBJECTIVE

To determine if certain PROCCs are associated with diagnostic concordance between a physiotherapist (PHT) and musculoskeletal medical specialists (sports physicians or orthopedic surgeons, MD) for patients with knee pain.

MATERIAL AND METHODS

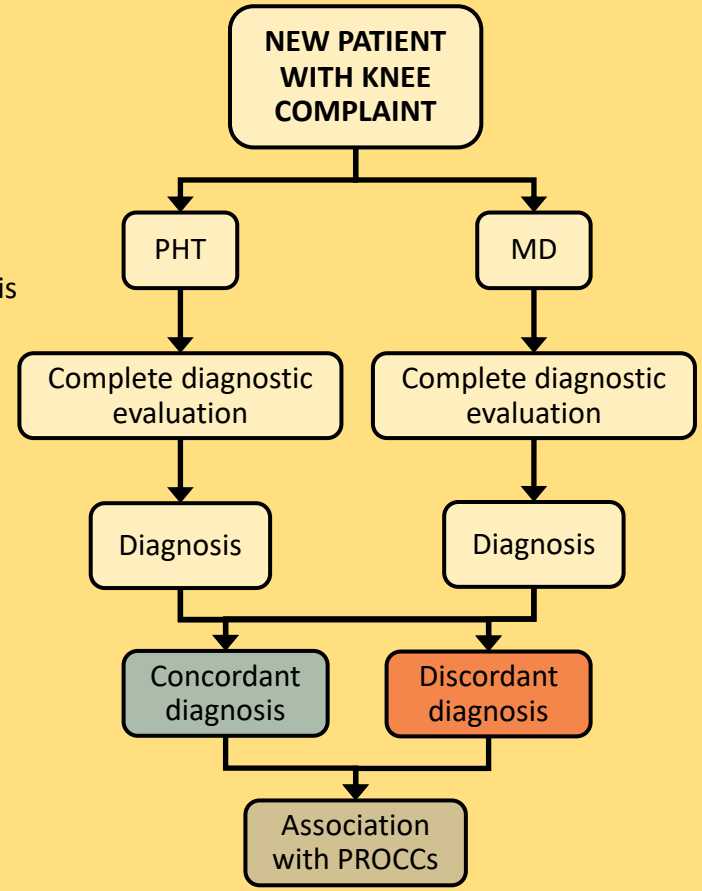
This is a **secondary analysis** of a diagnostic study including **279 patients referred for a knee complaint** at Maisonneuve-Rosemont Hospital's orthopedic clinic or family medicine clinic in Montréal, or students and staff invited to participate from Université Laval in Québec.

1. Complete diagnostic evaluations (anamnesis, subjective and objective physical assessment) were independently realized by a PHT and a MD for each patient.

2. The cohort was separated into 2 groups: concordant diagnosis and discordant diagnosis. A discordant diagnosis was defined as any difference in final diagnosis between PHT and MD. MD diagnoses were considered the reference standard.

3. PROCCs were first compared between groups using chi-squared or Student t-tests. PROCCs shown to differ between groups ($p<0.05$) were selected for further analysis.

4. Simple logistic regressions were used to determine the effect of significant PROCCs (independent variables) on the probability of diagnostic concordance or discordance (dependant variable).



RESULTS

PARTICIPANT CHARACTERISTICS (n=279)

MEAN **AGE = 49** (±16) yrs

FEMALE = 58%

MEAN **BMI = 29** (±7) kg/m^2

EMPLOYMENT STATUS
- **Employed & working = 62%**
- Retired = 17%
- Unemployed = 12%
- On work leave = 9%

SYMPTOM DURATION
- **> 1 month = 94%**
- ≤ 1 month = 6%

PROGRESSIVE ONSET OF SYMPTOMS = 69%

SYMPTOMS AT BOTH KNEES = 19%

MEAN **# OF COMORBIDITIES = 1** (±1)

MEAN **K6 SCORE** (/24) **= 3.6** (±4.6)

PATIENTS WITH MRI RESULTS = 41%

PHYSICAL ASSESSMENT TESTS PERFORMED BY MDs[†]
- Patients with limited passive knee flexion = 19%
- Patients with limited passive knee extension = 18%
- Mean # of positive observational tests (/6) = 1 (±1)
- Mean # of positive functional tests (/2) = 1 (±0.6)
- Mean # of positive palpation tests (/13) = 2.8 (±2.2)
- Mean # of positive inflammatory tests (/3) = 0.4 (±0.7)
- Mean # of positive ligament tests (/8) = 0.6 (±1.1)
- Mean # of positive meniscal tests (/2) = 0.3 (±0.5)
- Mean # of positive PFS tests (/4) = 0.6 (±0.8)

FINAL DIAGNOSIS
- **Osteoarthritis = 42%**
- PFS = 21%
- Meniscal pathology = 19%
- ACL pathology = 10%
- Other knee pathology[‡] = 8%

PATIENTS WITH >1 FINAL DIAGNOSIS = 29%

Standard deviations are presented as "±", BMI= body mass index, MRI= magnetic resonance imaging, PFS= patellofemoral syndrome, ACL= anterior cruciate ligament. [†]Physicians performed physical assessment tests they deemed relevant following a standardized guide. [‡]Other knee pathologies include all diagnoses that cannot be classified into one of the mentioned categories.

RESULTS

TABLE 1 – CHARACTERISTICS ASSOCIATED WITH DIAGNOSTIC CONCORDANCE (n=279)

		Discordant diagnosis (n=78)		Concordant diagnosis (n=201)		
		% (n)	Mean (SD)	% (n)	Mean (SD)	OR (95% CI)
Age			45.7 (13.6)		50.4 (16.5)	0.98* (0.96-0.998)
Employment status:	Retired	6.4 (5)		20.9 (42)		0.3* (0.1-0.7)
Patients with progressive onset of symptoms		55.1 (43)		74.1 (149)		0.4* (0.2-0.7)
Symptoms at both knees		10.3 (8)		22.4 (45)		0.4* (0.2-0.9)
Number of comorbidities			0.7 (0.9)		1.0 (1.0)	0.7* (0.5-0.9)
Physical assessment tests performed by MDs†:	Patients with limited passive knee flexion	10.3 (8)		22.9 (46)		0.4* (0.2-0.9)
	# of positive observational tests (/6)		0.7 (0.8)		1.1 (1.0)	0.6* (0.4-0.8)
	# of positive palpation tests (/13)		2.3 (1.8)		2.9 (2.3)	0.9* (0.7-0.98)
	# of positive PFS tests (/4)		0.4 (0.6)		0.7 (0.9)	0.5* (0.4-1.6)
Final diagnosis:	Osteoarthritis	28.2 (22)		47.3 (95)		0.4* (0.2-0.8)

SD= standard deviation, OR= odds ratio (associated with diagnostic discordance), PFS= patellofemoral syndrome. *p<0.05. †Physicians performed physical assessment tests they deemed relevant following a standardized guide.

TABLE 2 – CHARACTERISTICS ASSOCIATED WITH DIAGNOSTIC DISCORDANCE (n=279)

		Discordant diagnosis (n=78)		Concordant diagnosis (n=201)		
		% (n)	Mean (SD)	% (n)	Mean (SD)	OR (95% CI)
Employment status:	On work leave	15.4 (12)		7.0 (14)		2.4* (1.1-5.5)
K6 score (/24)			4.8 (5.4)		3.2 (4.2)	1.1* (1.01-1.14)
Patients with MRI results		55.1 (43)		35.8 (72)		2.2* (1.3-3.7)
Final diagnosis:	Other knee pathology†	19.2 (15)		3.5 (7)		6.6* (2.6-16.9)
Patients with >1 final diagnosis†		44.9 (35)		22.4 (45)		2.8* (1.6-4.9)

SD= standard deviation, OR= odds ratio (associated with diagnostic discordance), K6= Kessler Psychological Distress Scale (higher scores indicate higher psychological distress), MRI= magnetic resonance imaging. †Other knee pathologies include all diagnoses that cannot be classified into one of the mentioned categories.

DISCUSSION

Characteristics associated with diagnostic ***concordance*** include: **osteoarthritis**, **age**, being **retired**, having **progressive onset of symptoms**, having **bilateral symptoms**, **having a greater number of comorbidities** and having a **greater number of positive physical tests** during assessment by the MD.

- Several characteristics are possibility linked to osteoarthritis: age, being retired, having progressive onset of symptoms and having bilateral symptoms.
- Generally, a greater number of comorbidities are seen with advancement in age, possibly indicating a relation between both characteristics.
- Having a greater number of positive physical tests seems intuitive – a "textbook" clinical presentation would have a large number of positive tests all pointing towards the same pathology. Therefore, diagnosis would be clear and straightforward.

Characteristics associated with diagnostic ***discordance*** include: being on **work leave**, having a **higher psychological distress**, having **MRI results** and having an **uncommon diagnosis**.

- Being on work leave has been shown to increase the risk of developing chronic pain.
- Having a higher psychological distress has been shown to modify one's perception have one's health. We hypothesized that this may reduce reliability of anamnesis and subjective evaluation.
- Only MDs had access to MRI findings in our study, possibly explaining why this variable was statistically significant.
- Having an uncommon diagnosis may indicate that complex pathologies are more difficult to diagnose.

These results should be interpreted cautiously. Although simple logistic regression may show an association between PROCCs and diagnostic concordance, it does not allow to conclude a causal effect. Multiple regression analysis is warranted.

CONCLUSIONS

We have demonstrated for the first time that **many PROCCs are associated with the probability of diagnostic concordance** between healthcare professionals.

We have divided these characteristics into three (3) main categories:

SOCIODEMOGRAPHIC CHARACTERISTICS	PSYCHOLOGICAL DISTRESS	TYPE AND COMPLEXITY OF PATHOLOGY

Further studies are needed to better understand the causes of diagnostic discordance between healthcare professionals in different fields.

MAIN REFERENCES

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