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Clinicians' adherence to low back pain guidelines in the Czech Republic is low – an exploratory cross-sectional study

Adherence lékařů k doporučeným postupům je při léčbě bolesti zad v České republice nízká – explorativní průřezová studie

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Abstract

Aim: One of the potentially important barriers to the implementation of high-value care for individuals with low back pain is non-adherence to clinical practice guidelines. The aim of this study was to explore adherence to clinical guidelines in clinicians treating individuals with non-specific low back pain in the Czech Republic. *Subjects and methods:* Physiotherapists and physicians actively treating adult individuals with low back pain in the Czech Republic completed a self-reported clinical behavior questionnaire regarding intervention recommendations and educational statements selection based on clinical practice guidelines following a vignette representing an individual with non-specific low back pain together with demographic data collection and cross-culturally adapted Fear-Avoidance Beliefs Tool. Results: 344 participants were included in the analysis. Overall self-reported adherence to clinical guidelines was only 52% and was negatively associated with female sex (b = –1.04; P = 0.006), physiotherapy profession and lower education level (b = –2.51; P = 0.006), more years of practice (b = –0.04; P = 0.02) and higher Fear-Avoidance Beliefs Tool-CZ score (b = –0.2; P < 0.001). Our model explained 25% of the variance (R2 = 0.25). *Conclusion:* Our findings suggest that adherence to clinical guidelines regarding recommendations against inappropriate interventions and the promotion of unhelpful narratives is low in the Czech Republic. To facilitate high-value care for individuals with low back pain in the Czech Republic, local high-quality clinical practice guidelines should be developed in the future and different barriers and facilitators to its adaption and adherence should be further examined in quantitative as well as qualitative research so that the most important factors could be effectively targeted.

Key words

low back pain – guidelines – adherence – clinical practice – fear-avoidance beliefs

Souhrn

Cíl: Jednou z potenciálních překážek pro implementaci vysoce kvalitní péče o jedince s bolestí zad je nenásledování klinických doporučených postupů. Cílem této práce bylo zmapování adherence ke klinickým doporučeným postupům u kliniků/ček léčících jedince s nespecifickou bolestí zad v ČR. *Soubor a metodika:* Fyzioterapeuté/ky a lékaři/ky, kteří v ČR aktivně léči dospělé jedince s bolestí zad, vyplnili sebe-reportující dotazník ohledně preferovaného výběru intervencí a edukačních výroků na základě doporučení pro klinickou praxi a kazuistiky reprezentující jedince s nespecifickou bolestí zad společně s e sběrem demografických údajů a kulturně adaptovaným dotazníkem Fear-Avoidance Beliefs Tool. *Výsledky:* Do analýzy bylo zahrnuto 344 účastníků. Celková adherence ke klinickým doporučeným postupům byla pouze 52 % a byla negativně asociována s ženským pohlavím (b = –1,04; p = 0,006), fyzioterapeutickou profesí a nižším stupněm vzdělání (b = –2,51; p = 0,006), více lety praxe (b = –0.04; p = 0,02) a vyšším skórem v dotazníku Fear-Avoidance Beliefs Tool-CZ (b = –0,2; p < 0,001). Model vysvětlil 25 % z celkové variance (R2 = 0,25). *Závěr:* Naše zjištění naznačují, že adherence ke klinickým doporučeným postupům s ohledem na výběr léčebných intervencí a edukačních výroků je v ČR nízká. Pro podporu vysoce hodnotné péče o jedince s bolestí zad v ČR by měly být v budoucnu vytvořeny vysoce kvalitní lokální doporučené postupy a dále by měly být zkoumány v rámci kvantitativního i kvalitativního výzkumu různé překážky a podpůrné mechanizmy k jejich adherenci tak, aby bylo možné se účinně zaměřit na nejdůležitější faktory.

Klíčová slova

bolest zad – doporučené postupy – adherence – klinická praxe – postoje a přesvědčení

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Background

The implementation and adherence to clinical practice guidelines is an important part of high-value care for individuals living with low back pain (LBP), but no study to our knowledge explored adherence to LBP guidelines in the Czech Republic. LBP is the worldwide leading cause of years lost to disability, and the burden only continues to grow [1]. Based on the data from the Institute of Health Information and Statistics of the Czech Republic, between the years 2010 and 2020 about 10–12% of the 10.7 million Czech population were treated for LBP each year. In 2020, 2.2% of the population were on sick leave for LBP and 0.6% were on disability pension. Clinical practice guidelines are developed by multidisciplinary expert panels with members from relevant interest groups and include recommendations intended to optimize patient care based on a systematic review of the best available evidence and an assessment of the costs, benefits, and harms of alternative care options. There are recommended standards for the development of clinical guidelines which should be followed as well as instruments to evaluate the quality [2,3]. Although clinical guidelines have their limits, and are not the only way to improve the quality of care, their flexible adherence is recommended [3–5] since there is some evidence for a better cost-benefit ratio with guidelines adherence [6–10]. Despite this, clinicians commonly offer low-value care that is not aligned with clinical guidelines [11–14]. Non-adherence to guidelines is associated with different complex barriers and factors related to clinicians (clinicians' knowledge, attitudes and beliefs etc.), patients (patients' beliefs, attitudes and preferences), clinician-patient relationship (e.g., an effort to comply with the patient's request to avoid alliance rupture), guidelines characteristics (e.g., insufficient quality), and clinical context (e.g., lack of resources) [15–18].

Objectives

The purpose of this study was to evaluate adherence to clinical practice guidelines in clinicians treating individuals with LBP in the Czech Republic. The results could be used for further exploration and help to focus on the most relevant areas in the future since no study to our knowledge explored adherence to LBP guidelines in the Czech Republic.

Methods

Study design

This was an observational, exploratory cross-sectional study following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [19]. Participants were recruited for 2 months (from March to April 2021), all questionnaires were administered on-line in written form through Google Forms, and all participants received the same set of questionnaires. Based on the data from the Institute of Health Information and Statistics of the Czech Republic, there are approximately 8,300 physiotherapists and 44,700 physician of all specializations in the Czech Republic (no information about the proportion of those treating individuals with LBP was available), thus a random sample of 382 participants from this population would be required to be 95% confident in the data with a 5% margin of error (calculated using an online sample size calculator [20]).

Participants

Physiotherapists and physicians actively treating adult individuals with LBP in the Czech Republic and who were fluent in Czech were eligible for enrollment. We used convenience sampling because of its cost-effectiveness and to improve the heterogeneity of the sample, we recruited participants through administration offices of professional associations and societies (physiotherapists, physical medicine and rehabilitation, algesiology, neurology, and general practi-

Tab. 1. Clinical vignette based on which the respondents suggested therapeutic approach in the non-adherence questionnaire.

History taking and interview:
Patient M.A. (male, 45 years old) made an appointment because he is afraid of worsening his symptoms and ability to work and play sports since his low back pain (LBP) is not resolving.
He describes that his LBP is now lasting for 3 weeks, is of moderate intensity and is interfering with his activities. This episode started the day after moving furniture but there was no apparent injury. He reports that his LBP is aggravated with sitting longer than 10 min, slow walking for longer than 15 min and higher exertion. The position of ease is laying on the left side. He describes his pain as mostly "diffuse" and only sometimes sharp or pulling and that with higher exertion he sometimes feels diffuse spread into the buttocks area and proximal third of the dorsal thigh.
He reports an almost normal sleep pattern but some pain during position change and for that reason somehow more awakenings during the night. His pain is not worse in the morning, and he denies any swelling of his hands or feet. He excludes any apparent trauma, infections, fever, or chills as well as any abdominal pain, or digestive problems and he negates any other difficulties. He does not smoke. He does not take any medication and reports no significant health issues in the past except for a two-week episode of LBP after heavy lifting five years ago, arthroscopy of the left knee for sports injury ten years ago (no complications, no limitations now) and bronchial asthma in the childhood.
He works in information technology. He played soccer and went to the gym 1 or 2 times a week prior to this LBP episode but now does not participate in any sports.
Examination:
Antalgic posture with slight lateral flexion and shift of the trunk to the right and slight lumbar kyphosis in standing. Movements are overall slow and controlled. Forward and backward bending is limited by pain, and other trunk movements are only slightly painful in end ranges. M.A. is able to reach only the knees during trunk flexion. The cervical range of motion is without limitation. Irritation tests for sacroiliac joints are all negative. Deep tendon reflexes in the lower limbs are symmetrical and adequate, no irritative phenomena are present. Strength as well as the sensation of touch and pinprick are symmetrical and adequate. Straight leg raise test without pain to 60 degrees on the right, on the left dull ache in the buttocks area in about 50 degrees is reported, but dorsiflexion of the foot does not aggravate this pain. M.A. also negates any sensory loss in the perineal area or any sphincter dysfunctions. No other difficulties were apparent, and no other relevant findings were observed.

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Tab. 2. Demographic data.

Profession and education level*	PT BSc/ DiS. (3 years)	PT MSc. (5 years)	PT higher	MD (6 years)	MD higher	Total
N	110	108	12	88	26	344
Female (%)	89%	76%	67%	70%	19%	64%
Age; mean (SD)	36.8 (10.5)	36.2 (8.1)	41 (8.2)	47.4 (12)	52.6 (15.2)	40.7 (12)
Years of practice	12.2 (10.4)	10.5 (7.2)	14.3 (7.4)	19.9 (12.6)	26.6 (15.3)	14.81 (11.62)
Perceived expertise^{LE} (score 1–6)	3.75 (0.8)	4.04 (0.9)	4.58 (0.8)	4.17 (1.1)	4.23 (1.1)	4.01 (0.95)
Frequency^{LF} (score 1–5)	4.72 (0.7)	4.67 (0.6)	4.42 (1)	4.55 (0.7)	4.19 (0.9)	4.61 (0.69)
FABT-CZ score (score 10–60)	32.35 (4.8)	30.43 (5.8)	30.75 (5.6)	31.4 (6)	29.58 (6.4)	31.24 (5.65)
Non-adherence total score (score 0–24)	13.06 (2.7)	11.1 (3.5)	11.25 (3.6)	11.43 (2.8)	9.65 (2.8)	11.71 (3.19)
Intervention recommendations (score 0–12)	4.36 (1.8)	3.57 (2)	3.42 (2.2)	4.01 (1.8)	3.19 (1.8)	3.9 (1.9)
Educational statements (score 0–12)	8.7 (1.6)	7.53 (2.3)	7.83 (2.8)	7.42 (1.9)	6.46 (1.5)	7.81 (2.05)

*MD = 55% neurology, 20% rehabilitation and physical medicine, 17% algesiology, 4% general practitioners, 4% other

FABT-CZ – Czech version of Fear-Avoidance Beliefs Tool; LBP – low back pain; LE – measured with Likert scale (0 = "I have only basic knowledge" and 6 = "I am expert"); LF – measured with scale (5 = daily, 4 = weekly, 3 = once in two weeks, 2 = monthly, 1 = less than monthly); MD – medical doctors; N – number; PT – physiotherapists; SD – standard deviation

tioners), university hospitals, and private clinics in the Czech Republic, and we used social media advertisement as well.

Variables and measurements:

Demographic data were collected using a questionnaire including age, sex, education level, profession and specialization, years of clinical practice, average frequency of contacts with LBP patients measured on a scale from 1–5 (5 = daily, 4 = weekly, 3 = once in two weeks, 2 = monthly, 1 = less than monthly) and perceived expertise in LBP treatment measured on a scale from 1–6 (1 being "I have only basic knowledge" and 6 being "I am an expert"). For the measurement of fear-avoidance beliefs in health care practitioners, we used a cross-culturally adapted Fear-Avoidance Beliefs Tool (FABT-CZ) [21,22]. The Fear-Avoidance Beliefs Tool score is calculated from 10 items with Likert scales ranging from 1–6 so that total score ranges from 10–60 and higher scores indicate more pronounced fear-avoidance beliefs. Non-adherence to clinical practice guidelines was measured with a questionnaire focusing on self-reported behavior following a clinical vignette (Tab. 1). Items in this questionnaire were inspired by the studies conducted by Husted et al. [13] and Bishop et al. [23] and were formulated in a way so that adherence to the following guidelines [24,25] could be evaluated. As a point of reference for the evaluation of non-adherence to intervention recommendations (Tab. 2–4), we used the National Institute for Health and Care Excellence guidelines (NICE) [24], since these have the highest score based on AGREE II criteria [3] and no recent Czech guidelines of sufficient quality were identified apart from the Expert Opinion of the Czech Neurological Society [26]. For the evaluation of non-adherence to the recommended language, we used Australian guidelines by the NSW Agency for Clinical Innovation (NSW ACI) [25], since these were the only guidelines with specific examples of appropriate and inappropriate language we identified. In the NSW ACI guidelines [25], categories to avoid include language that promotes: a) "beliefs about structural damage/dysfunction"; b) "fear beyond the acute phase"; and c) "suggestions that hurt equals harm". On the contrary, categories to use included language that promotes: a) "a biopsychosocial approach to pain"; b) "encourages normal activity and movement"; and c) "encourages self-management". The total score of non-adherence in our study ranged from 0–24 (12 questions about intervention recommendations and 12 educational statements). We divided self-reported behavior into three categories: 1) "should be offered" which was counted as non-adherence if not marked; 2) "should not be offered" which was counted as non-adherence if marked; and 3) "could be offered" which was not counted as non-adherence in any option. The clinical vignette and non-adherence questionnaire were written by two physiotherapists (TK and MR) and were slightly improved after pilot testing (N = 10) with "the Three-step Test-interview" approach [27]. In the vignette, clinical presentation of non-specific LBP triggered by unusual strenuous physical activity was described together with important clinical findings in a way that adherence to aforementioned guidelines could be evaluated.

Statistical methods

Descriptive statistics were calculated for all variables. Any respondent who violated any instructions on the required items was not included in any analysis and any duplicate responses were not included in any analysis. For these reasons, no missing data were present. Because the number of demographic factors differed significantly between groups divided by profession and education level, a multivariate linear regression model was run, fit by ordinary least squares with non-adherence scores as the dependent variable and demographic data and Fear-Avoidance Beliefs Tool-CZ scores as the independent variables. Visual inspection of residuals was performed and assumptions of the normal distribution of residuals (Shapiro-Wilk test) as well as homogeneity of the residual variances (Levene's test) were met both times. Data analyses were conducted using LibreOffice Calc version 6.4.7.2 and all

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Tab. 3. Intervention recommendations.

Intervention recommendation based on guidelines [24]		(% of non-adherence)		
		% All	% PT	% MD
1.	Electrotherapy (–)	66%	74%	49%
2.	Diagnostic imaging (–)	58%	55%	64%
3.	Acupuncture (–)	42%	47%	34%
4.	Spinal injections (–)	36%	23%	64%
5.	Lumbar belt (–)	31%	33%	27%
6.	Traction (–)	29%	32%	25%
7.	Insoles (–)	29%	31%	25%
8.	Education about general prognosis of LBP (+)	20%	23%	13%
9.	Effort to reassure the individual with LBP (+)	20%	23%	13%
10.	Education about the nature of LBP (+)	3%	2%	5%
	Percentage of agreement with not evaluated recommendations	**% All**	**% PT**	**% MD**
a.	Home exercise (NE)	99%	100%	98%
b.	Individualized supervised exercise (NE)	99%	100%	97%
c.	Analgesics (NE)	67%	54%	92%
d.	Referred to psychological treatment (NE)	52%	59%	38%
e.	Group exercise (NE)	45%	45%	46%

(+) – counted as non-adherence if not checked; (–) – counted as non-adherence if checked, (NE) – not evaluated; LBP – low back pain; MD – medical doctors; PT – physiotherapists

Tab. 4. Manual therapy and psychosocial assessment recommendations.

Statements about treatment based on previous studies [13,23] and guidelines [24]		(% of agreement with the statement)		
		% All	% PT	% MD
11.	**Manual therapy**			
11.a	MT is appropriate as a stand-alone treatment. (–)	19%	16%	25%
11.b	MT should be used until pain decreases so then active treatment can be initiated. (–)	16%	13%	24%
11.c	MT could be offered only as a part of treatment together with active management. (+)	62%	69%	47%
11.d	Any MT are inappropriate. (–)	1%	0%	3%
11.e	MT should be used always until pain subsides. (–)	2%	2%	2%
	Total % of non-adherence	**38%**	**31%**	**53%**
12.	**Evaluation of psychosocial factors**			
12.a	Only a psychologist or psychotherapist should address these issues. (–)	3%	3%	2%
12.b	I am not sure what psychosocial factors are or I do not feel competent in this area. (–)	2%	3%	1%
12.c	I do not address these factors explicitly, but I try to read "between the lines". (–)	24%	30%	15%
12.d	I would explicitly address this area with the individual if improvement after a couple of weeks would not be evident. (+)	45%	36%	62%
12.e	During initial sessions I would explicitly ask about psychosocial factors or I would use appropriate questionnaires. (+)	26%	29%	20%
	Total % of non-adherence	**29%**	**35%**	**18%**

(+) – counted as non-adherence if not checked; (–) – counted as non-adherence if checked; (NE) – not evaluated; MD – medical doctors; MT – manual therapy; PT – physiotherapists

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Tab. 5. Recommendations for usual activities and work.

Statements about treatment based on previous studies [13,23] and guidelines [24]		(% of agreement with the statement)		
		% All	% PT	% MD
13.	**Usual activities**			
13.a	"Limit your usual activities until pain subsides." (–)	6%	6%	6%
13.b	"Continue in your usual activities only after pain improves at least a little bit." (–)	8%	8%	9%
13.c	"Limit any usual activities that are painful, but you can continue in pain-free activities" (–)	68%	70%	64%
13.d	"You should continue in your usual activities based on your tolerance, but you should gradually increase their level in time." (+)	16%	14%	19%
13.e	"Continue with your usual activities as usual." (+)	1%	1%	1%
13.f	I would not address this area if not asked. (–)	0%	0%	1%
	Total % of non-adherence	**83%**	**85%**	**80%**
14.	**Work / sick leave**			
14.a	"It is ideal to stay in your work as you are used to." (+)	3%	3%	4%
14.b	"It is a good idea to stay at your work, but it can be useful to adjust your workload." (+)	50%	51%	47%
14.c	"Sick leave should be short, but it is bad idea to return to your work until pain improves at least a little bit." (–)	23%	21%	26%
14.d	"You should return to your work after pain subsides." (–)	3%	3%	3%
14.e	"Sick leave is not good solution if it lasts more than couple of weeks." (–)	2%	2%	1%
14.f	I would not address this area if not asked. (–)	20%	20%	19%
	Total % of non-adherence	**47%**	**46%**	**49%**

(+) – counted as non-adherence if not checked; (–) – counted as non-adherence if checked; (NE) – not evaluated; MD – medical doctors; MT– manual therapy; PT – physiotherapists

Tab. 6. Educational statements.

Educational statements based on NSW ACI guidelines [25]		(% of non-adherence)		
		% All	% PT	% MD
15.	"In this acute stage, professionally developed and individualized exercise is more important than gradual return to usual activities." (–)	82%	81%	82%
16.	"LBP like yours usually settles down in a couple of weeks and does not have any long-term consequences but can reoccur or last longer in some individuals." (+)	43%	57%	15%
17.	"Pain like this can point to disc injury, which can be caused by excessive activity." (–)	49%	51%	44%
18.	"Assessment does not point to any serious cause or damage of your back, but it is clear that your back is really sensitive - which is luckily quite common and normal." (+)	42%	53%	22%
19.	"Pain during common movements does not mean you are causing harm to your back. On the contrary, movement is healthy for your back." (+)	72%	74%	68%
20.	"It is not that important how exactly you move or which activities and exercises you do - right now the gradual return to your usual activities is the most important." (+)	74%	82%	59%
21.	You should be cautious and limit the bending or lifting of heavy things with a rounded back." (–)	74%	82%	59%
22.	"Because of your back, from now on you should be more cautious about the quality of movement and load." (–)	93%	90%	97%
23.	"Back pain is linked with general health and can be possibly influenced by smoking, sleep, lack of movement, diet, stress, comorbidities etc." (+)	13%	10%	20%
24.	Improper movement stereotypes and postures can have a negative influence on structures of the back, which can manifest as a back pain." (–)	96%	94%	99%

(+) – counted as non-adherence if not checked; (–) – counted as non-adherence if checked; (NE) – not evaluated; LBP – low back pain; MD – medical doctors; MT– manual therapy; PT – physiotherapists

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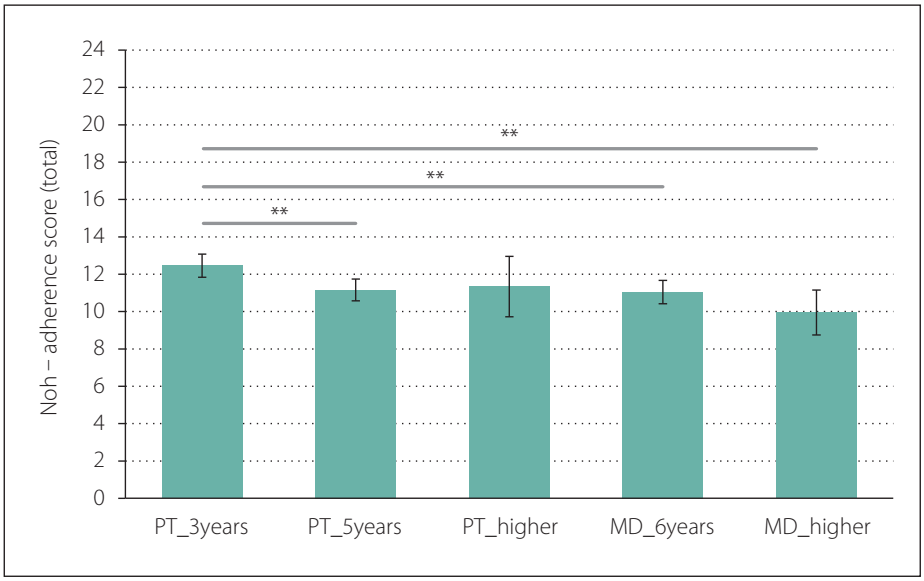


Fig. 1. Mean difference in non-adherence total scores between groups divided by profession and education level.
MD – medical doctors; PT– physiotherapists
Obr. 1. Průměrný rozdíl v celkovém skóru non-adherence mezi skupinami rozdělenými podle profese a úrovně vzdělání.
MD – lékaři; PT – fyzioterapeuti

statistical analyses were conducted with Jamovi version 1.2.27.

Results

We do not have any data about the number of non-responders since online questionnaires were not administered individually. We received 357 responses, but four participants were not included in the analysis because responses about age or year of practice were invalid, and nine responses were not included because they were duplicates. Thus, only 344 responses fulfilled all of the criteria and were analyzed. From the total sample, 67% were physiotherapists and 33% were medical doctors of heterogeneous specializations – of which 55% were neurologists. Descriptive analysis of demographic variables, Fear-Avoidance Beliefs Tool-CZ scores as well as non-adherence scores used for further statistical analysis are presented in Tab. 5. Data describing individual items of non-adherence questionnaires are presented in Tab. 2–4 and 6.

The overall average self-reported non-adherence was 48% and significant relationships were observed between the non-adherence total score and sex ($b = 1.04$; $P < 0.006$), years of practice ($b = 0.04$; $P = 0.017$), and Fear-Avoidance Beliefs Tool-CZ total score ($b = 0.2$; $P < 0.00001$) meaning that non-adherence scores were on average higher in females and that non-adherence scores on average increased for each additional year of practice as well as for each additional point in the FABT-CZ score. Furthermore, a statistically significant relationship with profession and education level was observed ($b = -1.24$; $P = 0.022$) and post-hoc comparison showed a significantly higher non-adherence total score in a physiotherapist with a 3-year education (DiS./BSc.) in comparison with other subgroups (Tab. 7, Fig. 1). Our model explained 25% of non-adherence variance ($R2 = 0.25$).

Discussion

On average, clinicians in the Czech Republic self-reported low adherence to clinical practice guidelines following a vignette representing an individual with non-specific LBP. This possibly means that low-value care is frequently implemented in common clinical practice which could create the potential for overall lower cost-effectiveness and risk-benefit ratio of health care in the Czech Republic. The overall average self-reported adherence was only 52% and statistically significant relationships between the total non-adherence score and sex, years of practice, FABT-CZ score, and profession and education level were identified in our study, although effect sizes were rather small, and all of the included independent variables explained the variation of non-adherence only partially ($R2 = 0.25$). For comparison, based on a systematic review by Zadro, O'Keeffe and Maher [14], the average adherence to guidelines for musculoskeletal conditions ranged from 54–57% in physiotherapists, but the methodologies of studies included in their review differed.

With respect to specific intervention recommendations, lowest adherence was reported in our study for electrotherapy (Q1, 34%) and imaging (Q2, 42%). There is general consensus that great emphasis should be placed on the reduction of excessive imaging for LBP since individuals with non-specific LBP are typically not reassured by imaging results and it generally does not benefit them in any way – imaging can even have a paradoxical negative impact on patient beliefs, attitudes, and behavior leading to worse clinical outcomes [6,29,30]. Regarding educational statements, lowest adherence was reported in items representing "language that promotes beliefs about structural damage/dysfunction" (Q24, 4%) and "language that promotes fear beyond the acute phase" (Q22, 7%), even though current evidence promotes moving away from education based on biomechanical assumptions emphasizing mainly structural pathologies and promoting unnecessary protection, avoidance, and unhelpful beliefs about vulnerability of the spine. Instead, creation of adaptive narratives through effective reassurance [31] and multifactorial education about pain [32,33] should be promoted together with adaptive self-management strategies including adequate physical activity and healthy lifestyle [34,35]. It is important to highlight that education about prognosis and physical activity should be individualized and based on risk profiles, presenting coping strategies of the individuals so that the provided information is not a false reassurance or does not promote maladaptive coping strategies [31]. On the contrary, highest adherence regarding intervention selection was with effort to reassure (Q9, 80%) and to educate the patient about the nature (93%, Q10) and general prognosis of LBP (Q8, 80%). Also, practically all participants recommended some type of exercise (Tab. 2), although concurrently almost 70% would recommend only pain-free activities (Q13.c, 68%) which could lead to excessive avoidance. The highest adherence

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Tab. 7. Relationships with non-adherence total score.

Linear model fit by OLS
R-squared = 0.272
Adj. R-squared = 0.253

Fixed Effects Parameter Estimates

Effect	Estimate	SE	Lower	Upper	df	t	P
(Intercept)	11.19	0.23	10.75	11.63	334	49.63	< 0.001
PT_5years – grand mean	–0.03	0.32	–0.66	0.6	334	–0.1	0.922
PT_higher - grand mean	0.15	0.66	–1.15	1.45	334	0.23	0.821
MD_6years – grand mean	–0.15	0.32	–0.78	0.47	334	–0.48	0.633
MD_higher – grand mean	–1.24	0.54	–2.29	–0.18	334	–2.3	**0.022***
Years_practice	0.04	0.02	0.01	0.07	334	2.4	**0.017***
Frequency	0.06	0.23	–0.4	0.52	334	0.26	0.797
FABT_total	0.2	0.03	0.15	0.26	334	7.53	**< 0.001*****
Female–male	1.04	0.37	–1.77	–0.3	334	–2.77	**0.006****
Perceived_expertise	0.23	0.18	–0.58	0.12	334	–1.29	0.2

Post-hoc comparisons – Profession and education level

Profession and education level	Difference	SE	Lower	Upper	df	t	$P_{bonferroni}$
PT_3years – PT_5years	1.3	0.39	0.55	2.6	334	3.38	**0.008****
PT_3years – PT_higher	1.12	0.86	–0.57	2.81	334	1.3	1
PT_3years – MD_6years	1.42	0.43	0.59	2.26	334	3.34	**0.009****
PT_3years – MD_higher	2.51	0.72	1.9	3.93	334	3.46	**0.006****
PT_5years – MD_6years	0.12	0.42	–0.71	0.95	334	0.29	1
PT_5years – MD_higher	1.21	0.71	–0.18	2.59	334	1.71	0.887
PT_5years – PT_higher	–0.18	0.85	–1.85	1.49	334	–0.21	1
PT_higher – MD_6years	0.3	0.86	–1.38	1.98	334	0.35	1
PT_higher – MD_higher	1.39	1.1	–0.59	3.37	334	1.37	1
MD_6years – MD_higher	1.9	0.67	–0.22	2.39	334	1.63	1

*P < 0.05; **P < 0.01; ***P < 0.001
df – degrees of freedom; FABT – Fear-Avoidance Beliefs Tool; MD – medical doctors; OLS – ordinary least squares; PT – physiotherapists; SE – standard error

regarding educational statements was in statements representing a "biopsychosocial approach to pain" (Q23, 87%) which "encourages normal activity and movement" (Q18, 58%). This is somehow surprising since the educational statements with the highest and lowest adherence are partially contradictory. A similar contradiction is also apparent in the difference between adherence to intervention recommendations (68%) and to appropriate educational statements (36%). This could be problematic because if the provided narratives are not clear as well as aligned with offered interventions, this could lead to patients' confusion and uncertainty about safe levels of activity or appropriate management strategies which can hinder participation and adversely affect outcomes [36,37].

Besides the influence of clinicians' fear-avoidance beliefs on clinical guidelines adherence [15,17], as was also supported in this study, different authors also reported other factors influencing non-adherence to guidelines, including lack of familiarity or lack of agreement, lack of self-confidence to implement a complex biopsychosocial approach, patients' attitudes, beliefs, and expectations as well as the patient-therapist relationship and other complex barriers [16,17]. It is also argued that fewer and more trustworthy guidelines with regular updates [3,4] and adaptations to assure feasibility and cultural appropriateness are needed for better implementation of clinical practice guidelines into clinical practice [1]. Since no recent guidelines of adequate quality written in the Czech language were identified, to promote high-value care for individuals with LBP in the Czech Republic, development of local high-quality clinical practice guidelines should be facilitated and different barriers and facilitators to their adaption and adherence should be further examined in quantitative as well as qualitative research so that

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the most important factors could be effectively targeted.

Our findings indicate that fear-avoidance beliefs should be prioritized in the education of all groups given the significant correlation between Fear-Avoidance Beliefs Tool-CZ scores and non-adherence. Additionally, training in communication skills and delivering adaptive narratives is crucial, as non-adherence was more pronounced for educational statements than for intervention recommendations. Enhanced education on LBP management is particularly important for BSc physiotherapists in the Czech Republic, who demonstrated the highest non-adherence scores.

Taken together, our results point not only to high self-reported non-adherence to guidelines regarding 1) inappropriate imaging and passive interventions (Tab. 2 and 3), but also to the possibility that 2) unhelpful narratives are delivered to patients together with the intention to promote recommended interventions (Tab. 4 and 6). Both can lead to paradoxical increases in distress, fear and avoidance, decreased self-efficacy, maladaptive coping strategies, and iatrogenic harm in prone individuals with LBP [6,29,30,38], as well as to overall lower cost-effectiveness and risk-benefit ratio of health care [6–8].

Limitations

Convenience sampling used in this study is associated with a number of biases and it can be expected that individuals more interested and educated in the subject will be more responsive. Furthermore, it is well known that self-reported behavior does not always correlate highly with actual behavior due to response bias and the use of a vignette, although vignettes were used in prior studies and are understood as a valid proxy [39]. For all these reasons, more guidelines-adherent responses can be expected. Another limitation is that a pre-determined sample size of 382 was not reached – post-hoc analysis revealed that with a sample size of 344 and a 95% confidence interval, the margin of error is 5.3% [20]. It is important to mention that the sample size was calculated for the whole population of Czech physiotherapists and physicians and that a smaller sample size would be sufficient if we could calculate how many of these clinicians actually treat individuals with LBP. Even though guidelines generally put an emphasis on patient education, reassurance, and promotion of physical activity, they usually lack specific examples or recommendations [40], and for this reason, the educational statements used in this study could be significantly influenced by our subjective biases as to whether they are adequately in line with these guidelines. To obtain more generalizable results, it would be beneficial to use standardized vignettes with more than one clinical presentation (e. g., individuals with acute, sub-acute, and chronic pain or with different degrees of complexity). Together with the region-specific nature of this study (the Czech Republic), all these factors limit the generalizability of our study.

Conclusion

The findings suggest that adherence to clinical guidelines regarding recommendations against inappropriate interventions and the promotion of unhelpful narratives is low in the Czech Republic. To facilitate high-value care for individuals with low back pain in the Czech Republic, local high-quality clinical practice guidelines should be developed in the future, and different barriers and facilitators to its adaption and adherence should be further examined in quantitative as well as qualitative research so that the most important factors could be effectively targeted.

Ethical aspects

The study was conducted in accord with the Declaration of Helsinki of 1964 and its later amendments and was approved by the Institutional Ethical Board of University Hospital Motol, Prague, Czech Republic (date: 12. 7. 2023, ref. no.: EK-771/23) and all the participants provided written informed consent. All data were analyzed anonymously.

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Author contributions

TK and MR researched the literature and conceived the study. AK was involved in protocol development and gaining ethical approval. MR was involved in participant recruitment. TK and MR were responsible for data acquisition and TK for data analysis and interpretation. TK wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

Conflict of interest

The authors declare they have no potential conflicts of interest concerning drugs, products, or services used in the study.

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