Factors associated with non-specific low back pain in field hockey: a cross-sectional study of Premier and Division One players

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01 Introduction

Non-specific low back pain (NS-LBP) is defined as pain, with or without leg pain, between the inferior margin of the twelfth rib and the inferior gluteal folds. It is typically diagnosed by ruling out other causes through patient history and physical examination. NS-LBP is common within sporting populations (Wall et al., 2023). In field-hockey specifically, the overall prevalence is reported to be between 33% and 67% depending on playing role and position, competitive level, age, and sex (van Hilst et al., 2015; Haydt et al., 2012).

Various other individual-, training-, and work-related factors are likely to alter the prevalence and overall risk of developing NS-LBP in field hockey. However, these remain largely unexplored within this group using appropriate statistical analysis despite having important individual, sporting, and clinical implications.

02 Research Question

Given the high prevalence of NS-LBP in field hockey and limited evidence exploring many of the notable risk factors using appropriate analyses in field hockey, this study sought to answer the following research question:

Are participant characteristics, injury history, training-related factors, and work and personal factors associated with greater or lesser odds of experiencing NS-LBP amongst Premier and Division One field hockey players in England?

03 Methodology

Design: A cross-sectional study design was used to gather information related to NS-LBP from participants who competed in the men's and women's Premier Division, Division 1 North and Division 1 South for field hockey.

Procedures: After pilot work, an online questionnaire was shared with 18 clubs (out of 63) who agreed to disseminate the link to an estimated 1116 players. Ethical approval no. 44891.

Dependent variable: Experienced NS-LBP (yes/no)

Independent variable grouping: Participant characteristics, injury history, training-related factors, work and personal factors.

Analysis: Descriptive statistics and prevalence were determined. The association between independent variables and back pain were examined using uni- and multi-variable analysis (Bullock et al., 2021). The final model was constructed using probability statistics, odds ratio, and perceived clinical value.

04 Results

A total of 194 responses were received from those competing in the men's and women's Premier Division, Division 1 North and Division 1 South, reflecting a response rate of ~19%.

Demographic information and prevalence of NS-LBP are presented in Table 1.

Table 1. Demographic information and prevalence of NS-LBP

Variable	Grouping	Non-specific low back pain		Prevalence
		Yes	No	
Age (years)	16-18	9	29	24%
	19-24	26	42	38%
	25-30	29	22	57%
	>30	22	15	60%
Sex	Men	46	53	47%
	Women	40	55	42%
Stature (cm)	<160	4	8	33%
	161 – 170	12	36	25%
	171 – 180	33	31	52%
	>180	37	33	53%
Playing experience (years)	0-3	0	2	0.0%
	4-7	12	14	46%
	8-11	22	30	42%
	>11	52	62	46%
International player	Yes	23	15	61%
	No	63	93	40%
Playing position	Goalkeeper	7	4	64%
	Defender	29	39	43%
	Midfielder	25	39	39%
	Forward	25	26	49%
Stick length	35"-35.5"	10	7	59%
	36"-36.5"	50	74	40%
	37"-37.5"	25	27	48%
Perform drag flicks	Yes	21	9	70%
	No	65	99	40%
Experience stiffness or tightness	Yes	57	32	64%
	No	29	76	28%
Training hours during a typical week	0-2	10	9	53%
	3-5	41	55	43%
	6-8	26	30	46%
	9-10	6	10	39%
	>10	3	4	43%
Hockey matches/week	1	48	80	38%
	2	36	25	59%
	≥3	2	3	40%
Lifting heavy loads at work	Yes	23	10	70%
	No	63	98	39%
Perceive work to increase fatigue	Yes	50	56	47%
	No	36	52	41%
Perceive work to prevent recovery	Yes	45	28	62%
	No	41	80	34%
Perceive sleep as good quantity	Yes	49	81	38%
	No	37	27	58%
Perception of job stress	Never	4	13	24%
	Rarely	13	28	32%
	Sometimes	46	54	46%
	Frequently	23	13	64%
Stressful life event	Yes	49	41	54%
	No	37	67	36%

Univariable analysis
13 individual factors were associated with greater odds of NS-LBP. Beyond those in the final model (Figure 1), this included competing in indoor hockey (OR = 1.896, p = 0.057) and standing at work for 50% of the time (OR = 1.420, p = 0.231).

5 factors were associated with lower odds which, beyond those in the final model, included sleep quality (OR = 0.32, p = 0.001).

Multivariable analysis
Two additional factors were included from the univariable analysis (sex and playing experience). Being in the youngest age group, playing midfield and sleep quality were no longer associated (OR = 1.13-1.52).

Four additional factors were associated with lower odds and included in the final model (Figure 1).

Final model
An overview of variables included in the final model is provided in Figure 1.

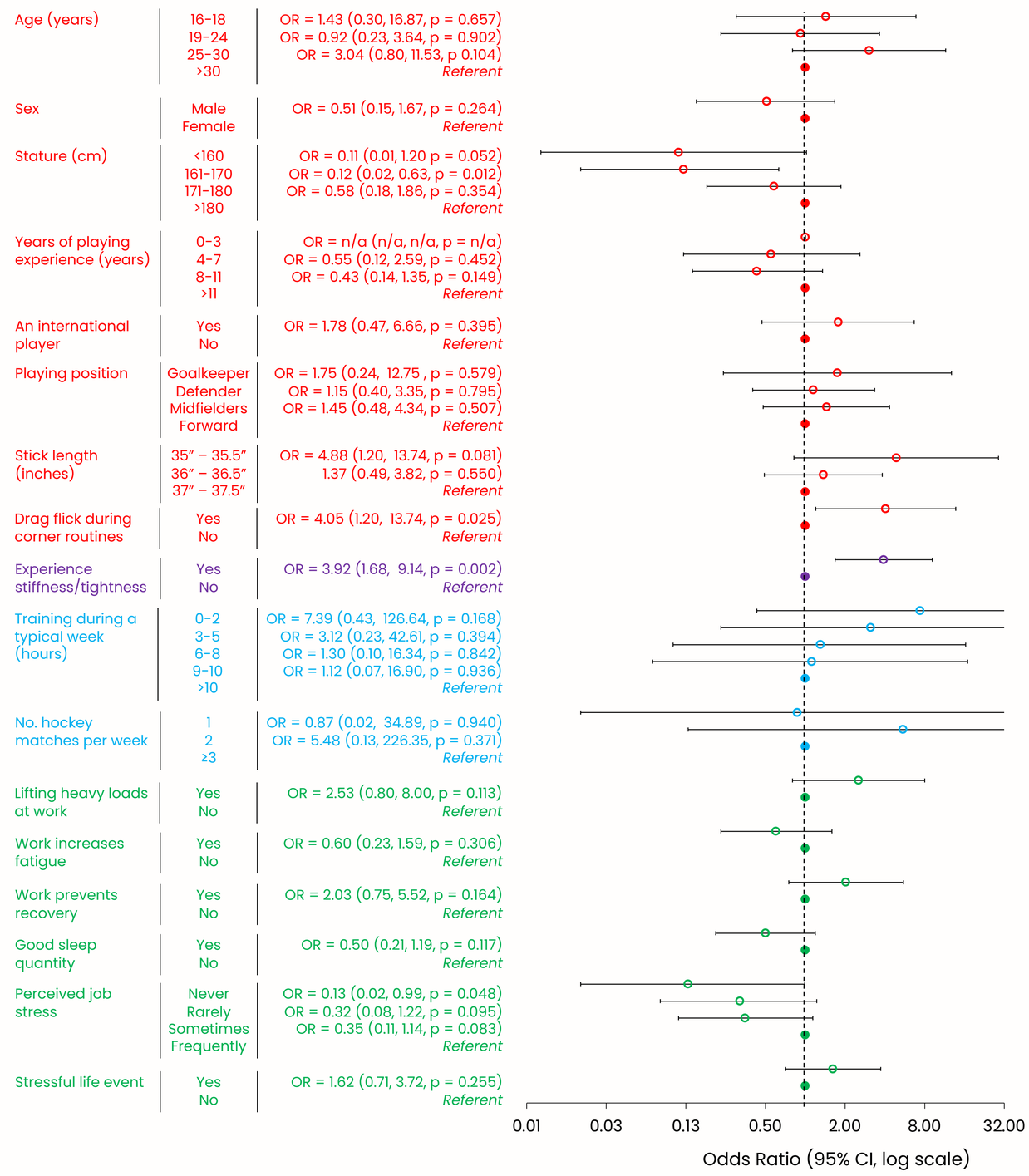

Figure 1. Association between independent factors with NS-LBP in the final multivariable model.

05 Conclusion

This study found an overall lifetime prevalence of NS-LBP within the region of 44% as well as variations in prevalence according to specific sub-groupings within field hockey.

Clinicians working in field hockey can consider the key risk factors presented in Table 2 that are associated with NS-LPB when considering injury risk, movement screening approaches, and athlete management.

Table 2. Summary of key risk factors associated with non-specific low back pain

Variable	Interpretation
Age	Players aged 25 to 30 are at greater odds (OR = 3.04) of developing NS-LBP compared to the older group.
Stature	Players under <170 cm were at lower odds (OR = 0.11 to 0.12) of developing NS-LBP compared to those >170 cm.
Position	Goalkeepers and midfielders seem to present with slightly higher odds of NS-LBP (OR = 1.45 to 1.75).
Playing International Hockey	Those competing at an international level are at higher odds of NS-LBP (OR = 1.78).
Drag Flick	Those who drag flick in short corner routines are at 4.05 times greater odds of developing NS-LBP.
LB stiffness or tightness	Players who perceive their LB to be stiff or tight are at 3.92 times greater risk of developing N-SLBP
Occupational factors	Lifting heavy load at work, perceived work to prevent recovery, and experiencing a stressful life event were associated with greater odds of LBP (OR = 1.62 to 2.53). Perceiving work to increase fatigue, good sleep quantity, and minimal job stress were associated with lower odds of NS-LBP (OR = 0.13 to 0.60).

06 References

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