

Research article

Developing strategies for reducing work-related discomfort in optometry students

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Abstract

Background: Work-related physical discomfort occurs in Australian optometrists. The purpose of this paper is to explore appropriate methods for educating optometry students about work-related discomfort before they commence clinical practice. **Methods:** Two surveys were distributed: one to students at the School of Optometry and Vision Science, University of New South Wales; the second to clinical teachers at four Australian and New Zealand optometry teaching institutions. The surveys were subject to descriptive analysis. **Results:** Sixty-four optometry students (48% response rate) and 46 academic and clinical teachers (30% response rate) participated. Students reported discomfort in the previous 7 days (56% respondents) and previous 12 months (77% respondents), most commonly in the lower back, neck, shoulder and elbow/arm. Informal instruction by clinical supervisors was the first preference for students learning how to reduce work-related discomfort (28% respondents). Advice from seniors/friends who have experienced discomfort and formal instruction in practical classes were also accepted learning methods. Patient comfort was rated more important than personal comfort when performing clinical procedures (Wilcoxon Signed Rank Test, $p < 0.01$). Informal instruction and comments during clinic supervision was the most common form of instruction (89%) reported by optometry teachers. **Conclusion:** Work-related discomfort is experienced by optometry students and should be raised as an issue during training. Clinical teachers, both within optometry clinics and at external placements, should also receive training so that appropriate advice is given to students. Further investigation is required to identify tasks and environments which demonstrate a reduced risk of work-related discomfort and then maximise student exposure to these positive examples.

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Background

Optometry is a primary healthcare profession with 4,429 registered practitioners in Australia (1). Work-related physical discomfort occurs in Australian optometrists (2), with the greatest risk for females and those who perform more than 11 consultations per day. The risk of severe discomfort is increased by performing repetitive tasks and continuing to work while injured.

It is unknown whether optometry students also experience work-related discomfort, although work-related discomfort has been reported in other healthcare students (3-6) with patterns of injury similar to that in clinicians (5). Explanations for discomfort include naivety to the possibility of injury (7), attitudes (e.g. patient comfort is more important than self-comfort) (7-8), and exposure to incorrect techniques (9). Teaching techniques employed to reduce work-related discomfort include feedback during clinical exercises (10) and theoretical and practical instruction (4, 6), but there are risks that good techniques will be undermined by outmoded practice (7, 9), poor workplace and equipment design, and inconsistencies between formal teaching content and practical observation of clinicians (11).

This paper forms part of a multistage project investigating work-related discomfort in Australian optometrists, the goal

of which is to develop guidelines for clinical practice. The purpose of this paper is to: (i) describe optometry students experience of work-related physical discomfort; (ii) determine how students rate the importance of their own physical comfort; (iii) compare student preferences for learning how to reduce the risk of work-related physical discomfort with methods currently employed by clinical educators; and (iv) explore education strategies to reduce work-related discomfort in students.

Methods

Two online surveys were developed, one for undergraduate optometry students and one for optometric clinical teachers. Questions relating to students' experience of work-related discomfort were based on the Nordic Musculoskeletal Questionnaires (12) and a previous questionnaire developed for Australian optometrists (2). For consistency with other stages of the study (2) physical discomfort was defined as pain, ache, difficulty with movement and numbness. Other questions were developed by analysing student and teacher clinical timetables and informal interviews with students and teachers. Both surveys were pilot tested and then edited for clarity and relevance.

Potential participants were sent an email invitation containing a link to the survey and a follow up reminder email two weeks

later. Results were saved with a unique identifying number related to the IP address of participant's computer which prevented participants submitting multiple responses. A word version of the teachers' survey was also distributed to casual clinical teachers at the University of New South Wales (UNSW) with a return addressed envelope and responses were manually entered into the database by the first author. A summary of the distribution, duration and construction of the two surveys is given in Table 1.

Table 1. Methodology summary of student and teacher surveys

	Student Survey	Teachers Survey
Participants	Stage 3,4 and 5 undergraduate optometry students UNSW ¹	Academic and clinical teachers Australia: <ul style="list-style-type: none"> • Queensland University of Technology • UNSW¹ • Australian College of Optometry New Zealand: <ul style="list-style-type: none"> • University of Auckland
Pilot Study	11 students	7 clinical teachers
Main study	64 students	46 clinical teachers
Content	<ul style="list-style-type: none"> • Demographic questions • Experience of optometry work-related discomfort • Experience of learning how to improve physical comfort while performing clinical procedures • Preferences for learning how to reduce optometry work-related discomfort • Attitudes to patient-comfort and self-comfort 	<ul style="list-style-type: none"> • Demographic questions • Experience of optometry work-related discomfort • Type of teaching given related to optometry work-related discomfort
Distribution method	Internet link to online survey sent to student email account	Internet link to online survey sent to email accounts of clinical teachers at each of the 4 teaching institutions. A hardcopy of the survey was placed in the pigeon holes of casual clinical teachers at UNSW ¹ .
Duration	The survey was open from the 26th August 2010 to the 19th September 2010.	The online survey was open from 25th June 2010 to 1st October 2010 Hardcopy versions were received up until the 15th October 2010.

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Both studies were approved by the Human Research Ethics Advisory Panel of the UNSW (reference numbers 10038 and 10040). There was implied consent, if participants chose to complete and submit the survey. Data was managed within a Microsoft excel spread sheet and SPSS (13) and analysed using descriptive statistics.

Results

Students

There was a 48% response rate for the student survey (64 full-time optometry students n=45 female). The gender response rate (70% female) is similar to the gender distribution of senior students enrolled in the optometry program at UNSW (58% - 64% in years 3, 4 and 5).

Clinical exposure over the previous 7 days ranged from less than 3 hours (n=13) to 10+ hours (n= 31) (Table 2). The variation in clinical exposure is attributable to clinical rosters for internal and external clinics and pre-clinical laboratory classes. Clinical exposure over the previous 12 months is difficult to estimate because of the varied experience of students within the clinical program and is therefore not reported in this paper.

Table 2. Profile of students and experience of discomfort in the last 7 days and in the past 12 months

		Number of students reporting discomfort in the past 7 days		Number of students reporting discomfort in the past 12 months	
		Yes	No	Yes	No
Gender	Male	10	9	12	7
	Female	26	19	36	9
Stage of study	Year 3	9	5	9	5
	Year 4	12	14	18	8
	Year 5	15	9	21	3
Clinical exposure during past 7 days	< 3hours	5	8	-	-
	4-6 hours	8	1	-	-
	7-9 hours	5	6	-	-
	10+ hours	18	13	-	-
Actively seek information to improve physical comfort	Yes	8	4	8	4
	No	28	24	40	12

Discomfort was reported when performing clinical techniques in the previous 7 days (n=36, 56%) and in the previous 12 months (n=49, 77%). There were no significant relationships between demographic factors and experience of discomfort although gender and experience of discomfort in the previous 12 months approached statistical significance (chi-square p = 0.06). Lower back, neck, shoulders and elbows/arm were the most frequently reported discomfort sites (Table 3) and were primarily related to performing specific ophthalmic tasks such as direct ophthalmoscopy, retinoscopy and slit lamp funduscopy.

A small number of respondents (n=12) reported that they have actively sought information from other optometrists or classmates to improve their physical comfort. Only one reported that they had consulted textbooks and the Internet.

The majority of respondents (n=47, 73%) recalled receiving instruction or advice on how to improve their physical comfort while performing clinical procedures. This included

Table 3. Discomfort associated with clinical techniques according to body site reported by students in the previous 7 days and the previous 12 months

	% of students reporting discomfort in previous 7 days	% of students reporting discomfort in previous 12 months
Lower back	31	42
Neck	25	39
Elbows/arms	17	33
Shoulder	17	31
Upper back	14	22
Wrist/hands	13	17
Knees/legs	11	22
Ankles/feet	3	8

informal advice from supervisors during practical classes and clinics (n= 36), instruction in lectures (n=21), formal instruction in practical classes (n=9), and advice from seniors/friends who had experienced discomfort (n=6).

Respondents nominated informal instruction or comments from supervisors while performing clinical procedures (28%), formal instruction in practical classes (27%), and one-on-one supervision (14%) as their first preference for learning how to reduce discomfort (Table 4). Other learning methods which were also accepted (but not rated as the first preference) included advice from seniors/friends who had experienced work-related discomfort, trial and error, and watching other colleagues.

When asked to rate the following statements on a Likert scale from 1 (strongly disagree) to 5 (strongly agree):

- “When I set up the consultation room/equipment, I ensure that I am physically comfortable” and
- “When I set up the consultation room/equipment, I ensure that my “patient” is physically comfortable”

Patient comfort was rated more important than personal comfort (Wilcoxon Signed Rank Test, p<0.01).

Clinical Teachers

There were 46 clinical teachers (30% response rate) who participated in the survey, 89% of whom perform clinic supervision. The majority of respondents’ work as an optometrist at least one day per month (78%) and make adaptations to clinical techniques to enhance their own physical comfort (93%). Despite this, 48% report that they experience physical discomfort when performing clinical tasks (Table 5).

Providing informal feedback to students (e.g. instruct student to raise the height of the patient chair) and formal instruction in practical classes were the most common teaching methods employed by respondents to assist student comfort (Table 4).

Table 5. Profile of clinical teachers who participated in survey

		Respondents	
		n	%
Gender	Male	14	30
	Female	32	70
Years of clinical teaching experience	< 1 year	3	7
	1-5 years	23	50
	6-10 years	4	8
	11-15 years	7	15
	15+ years	9	20
Works as an optometrist	At least one day per month	36	78
	Less than one day per month	10	22
Personal experience of physical discomfort	Yes	22	48
	No	24	52
Adapts own clinical technique to enhance physical comfort	Yes	43	93
	No	3	7

Table 4. Student preferences for learning and teaching methods employed by clinical teachers

	Students FIRST preference for learning		Students who would accept this teaching method*		Teachers who use this method*	
	n	%	n	%	n	%
Informal instruction from clinical supervisor	18	28	40	63	41	64
Formal instruction in practical classes	17	27	33	52	19	30
One-on-one supervision by lecturer/supervisor	9	14	15	23	n/a	
Videos shown in practical classes	6	9	19	30	2	3
Trial and error	5	8	26	40	n/a	
Group discussion	3	5	15	23	2	3
Watching other colleagues	2	3	25	39	n/a	
Advice from seniors/friends who have experienced discomfort	2	3	34	53	n/a	
Lectures	1	1.5	17	27	5	8
Other (not specified)	1	1.5	n/a		n/a	

* Percentages total more than 100% because respondents could select more than one option

Discussion

Optometry students report discomfort associated with performing clinical procedures and female students are more likely to report discomfort than male students. This is similar to reports of medical (3) and dental (5) students and of trends within the optometry profession (2). Reports of upper body and upper limb discomfort associated with specific ophthalmic techniques are also consistent with unpublished data from this multistage project and with descriptions in the ophthalmic literature (14).

A small number of students report that they have actively sought solutions for their discomfort. Only some students recalled receiving instruction in lectures and practical classes. This inability to recall receiving instructions is similar to comments made by clinical optometrists during interviews (15). Further investigation is required to determine whether teachers need to state more explicitly why this knowledge is important (16) and has practical value (17) or whether instruction needs to be given through a variety of methods to cater for different learning preferences (18-19).

Clinical teachers are not given formal instruction how to teach students to perform clinical techniques to reduce work-related discomfort, nor is this an assessable component of the optometry course. Therefore, it is encouraging that the majority of clinical teachers who participated in this study report that they provide feedback to students during clinic supervision to assist their physical comfort. This type of instruction is valued by students, who rated this learning method highly. There are probably many reasons optometry students rate their own comfort secondary to patient comfort, and it is interesting that this attitude also occurs in other healthcare student populations (7-8). There is an opportunity for clinical teachers, who are effectively role models for the next generation of professionals, to provide guidance to students to assist their physical comfort (20).

Limitations

There was response bias as students who experience discomfort may have been more likely to participate. On the other hand, variations in clinical case load could contribute to discomfort (3, 5) – if so, then the figures reported in this study may underestimate the actual discomfort experienced by students engaged in clinical work. Further investigation is required to determine if distributing the survey later in the teaching session influences reports of discomfort (21).

There was also likely response bias in that 93% of clinical teachers reported adapting their own clinical techniques to improve physical comfort; this heightened awareness may have influenced their participation. Despite this, 48% of participants reported work-related physical discomfort, indicating a need for the profession to better understand discomfort, especially if clinical teachers give advice to students.

It is possible that there might be recall bias in asking participants to report their experience of discomfort, leading to an overestimate of actual discomfort (22), particularly if currently experiencing symptoms (23). On the other hand, 22 teachers (48%) and 36 students (56%) reported discomfort

while performing clinical procedures, indicating that for some, at least, this is a very real issue during their working day.

Developing strategies for reducing discomfort in optometry students

Continuing to work while injured is a risk factor for severe discomfort in optometrists (2). If students experience discomfort while performing clinical techniques, then this can have consequences for their longevity in the profession and their personal health. Further investigation is required to determine how best to address this issue, for example, developing teaching materials and making them widely assessable. However, the results of this study and evidence reported in other professions indicate that a three way strategy may need to be developed: educate the students, educate the educators, and maximise student exposure to best practice.

Educating students

“Give me a fish and I eat for a day. Teach me to fish and I eat for a lifetime.” (Chinese Proverb)

Work-related discomfort could be raised as an issue among students by providing students with a short information sheet describing the risk factors, possible symptoms, and suggestions for remediation (24). A longer term strategy would be to teach students practical methods to identify and solve work-related discomfort issues (24), which can be applied throughout their career (25), and to any working environment. This is an area optometrists have previously indicated a lack of confidence (26). Engaging students in problem solving to reduce work-related discomfort is one method of education and could help influence attitudes, as students share their new-found knowledge with their colleagues (27), particularly senior students who supervise junior students during practical classes (6) or who act as peer-mentors for junior students. This is consistent with this study's results which indicate that students like to learn by watching others and obtaining advice from those who have experienced discomfort.

Educating the educators

“Who dares to teach must never cease to learn.” (John Cotton Dana)

Clinical teachers and supervisors, both within optometry clinics and at external placements, help shape student perceptions and attitudes (11, 17, 20, 28) and are well placed to help students understand the importance of self-comfort. Therefore, it is important that clinical teachers give correct and uniform advice to students; otherwise students may receive mixed messages which they then need to interpret on their own (11). Clinical teachers need to receive regular information about current best practice (9), which in turn could assist their own clinical practice (28), and reduce their own personal discomfort.

Maximising student exposure to good practice

“By learning you will teach, by teaching you will learn.” (Latin Proverb)

Australian optometry students may encounter unsafe work environments or observe techniques contrary to what they

have learnt at university when attending external placements. Although they may have skills to identify unsafe work environments and change their own practice accordingly, they may not have the authority or resources to implement change (6-7, 9) (for example, use alternative equipment or change workplace design) and so may view poor practice as ubiquitous (24). Teaching institutions need to develop mechanisms for students to report poor practice to the workplace or to the course facilitator. This provides opportunities for students to reflect on and discuss issues arising in their placements (9), e.g. as group discussion activities. There is also the opportunity for workplaces to learn best practice from interacting with students (20), which could include clinical techniques and equipment and workplace design. This could be promoted to workplaces as a benefit of participation.

To the future

Educating students and educators is considered a sound strategy for reducing the risk of work-related discomfort (7, 20, 29-30) and has been shown to be effective in changing knowledge and attitudes within nursing (30). Further investigations are required to develop appropriate curricula for teaching optometry students and educators how to reduce the risk of work-related discomfort and to develop outcome measures for assessing the success of such programs. However, a three-way strategy, as described in this paper, ensures a consistent message for reducing work-related discomfort at all stages of the learning process and this may have a flow-on effect for reducing work-related discomfort within the profession.

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