Experienced fatigue, pain and instability during sitting in persons with chronic SCI

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no potential conflict of interest

ALLRISC: Active LifestyLe Rehabilitation Intervention in aging Spinal Cord injury: a multicentre research program

Introduction

Wheelchair bound persons with a chronic SCI:

- Are in the wheelchair for many hours a day
- Have less opportunities to change seating position
- Do all their activities while seated

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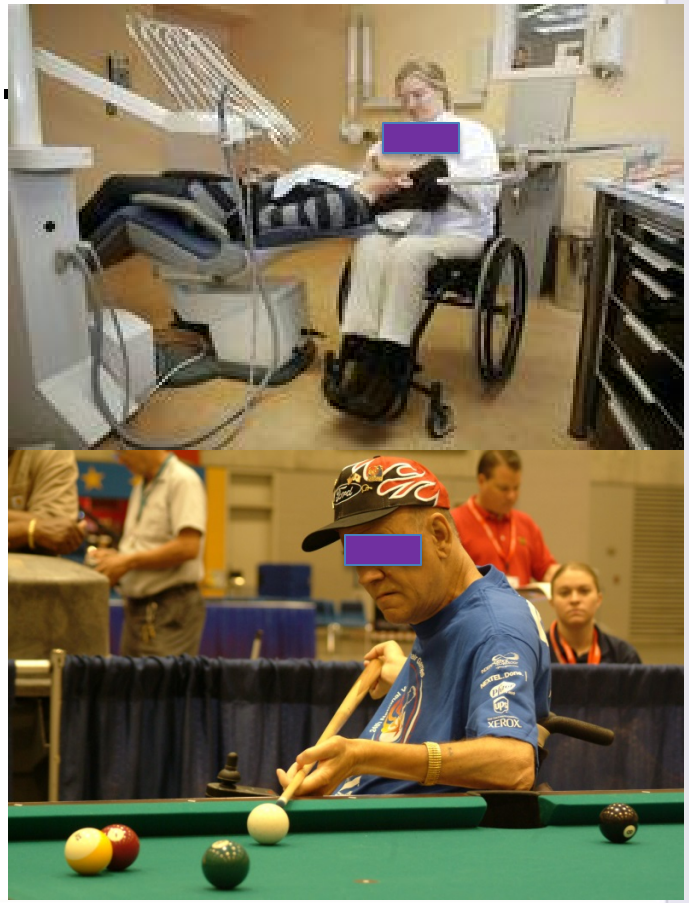
Seating **comfortable** and **stable**

is a prerequisite

for optimal daily functioning.



Research questions

1. How do persons with a spinal cord injury experience **comfort** during sitting?

a) Fatigue

b) Pain

- Location of pain

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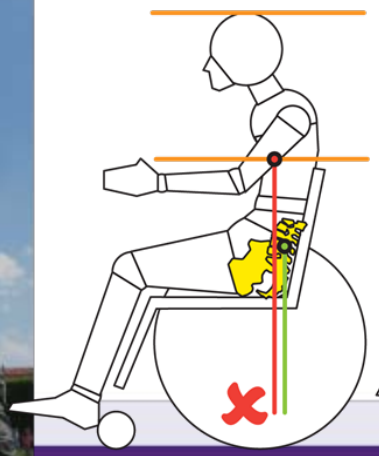
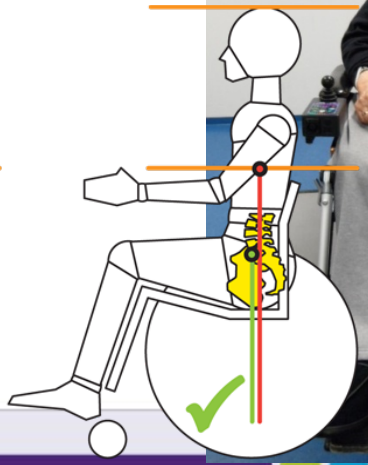
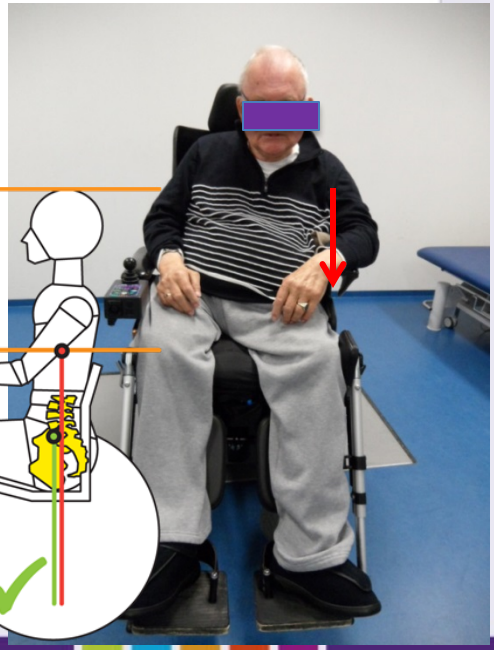
Research question

2. How much stability is experienced during a)**”normal” seating ?**

Working against gravity ?







Research question

2.How much stability is experienced during

b) reaching e.g. for a bottle (paraplegia) ?

or a cup (tetraplegia) ?




Research questions

3. Do people lack support in their wheelchair ?
   a) where exactly?
   b) Is fatigue related to lack of support?

4. Are people satisfied with their sitting posture?
   a) and can it be improved?
   b) Is satisfaction related to lack of support?

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Methods

- A cross-sectional study using a self-report questionnaire

- **Subjects:** ALLRISC-dataset (N=282 received questionnaire):
  - who use a wheelchair for daily mobility
  - TSI: ≥10 years
  - Age: >18 year when SCI was diagnosed;
    at time of questionnaire: 28-65 years

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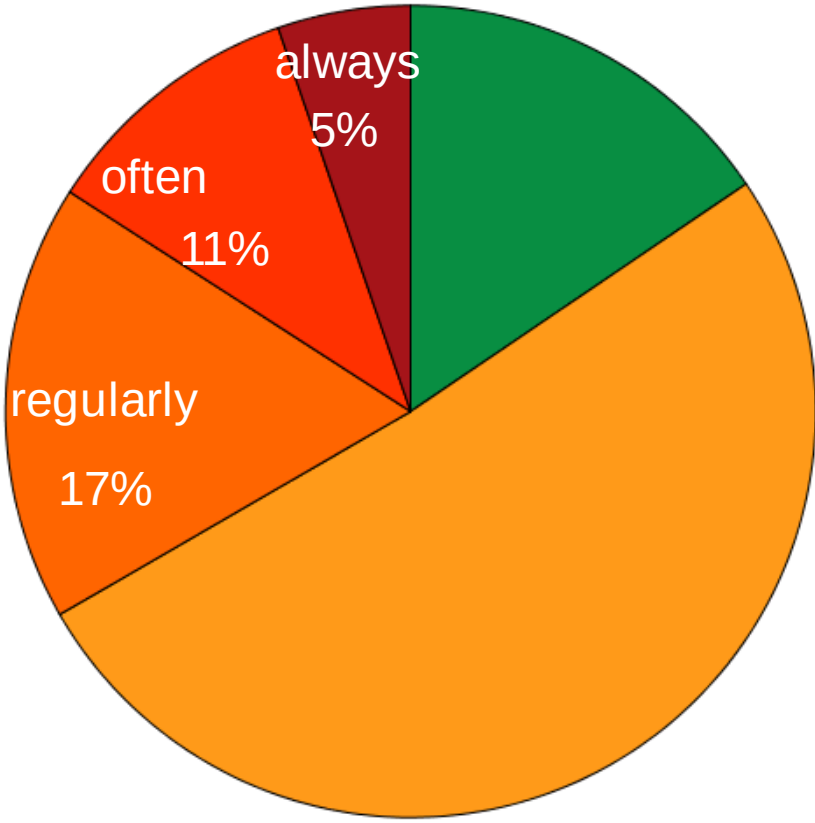
Filled in questionnaire: N=263	Paraplegia (n= 157)	Tetraplegia (n= 106)
Men / women	107 / 50	86 / 20
Lesion level	Th1-6: n=97 Th7-12: n=59	C5-6: n=75 C7-8: n= 31
AIS AB/ CD	135 / 22	80 / 26
Age	49 ± 9 yrs	48 ± 8.5 yrs
TSI	24 ± 9.5 yrs	24 ± 8.5 yrs
Use **Hand rim-WC/ Powered-WC/ both**	**146 / 2 / 9**	**65 / 27 / 14**
Hours/daily	**13 ± 3.5 hours**	**14 ± 3 hours**

1a) Is seating fatiguing?

N=265	Fatiguing
never	16%
sometimes	51%
Regularly-always	33%



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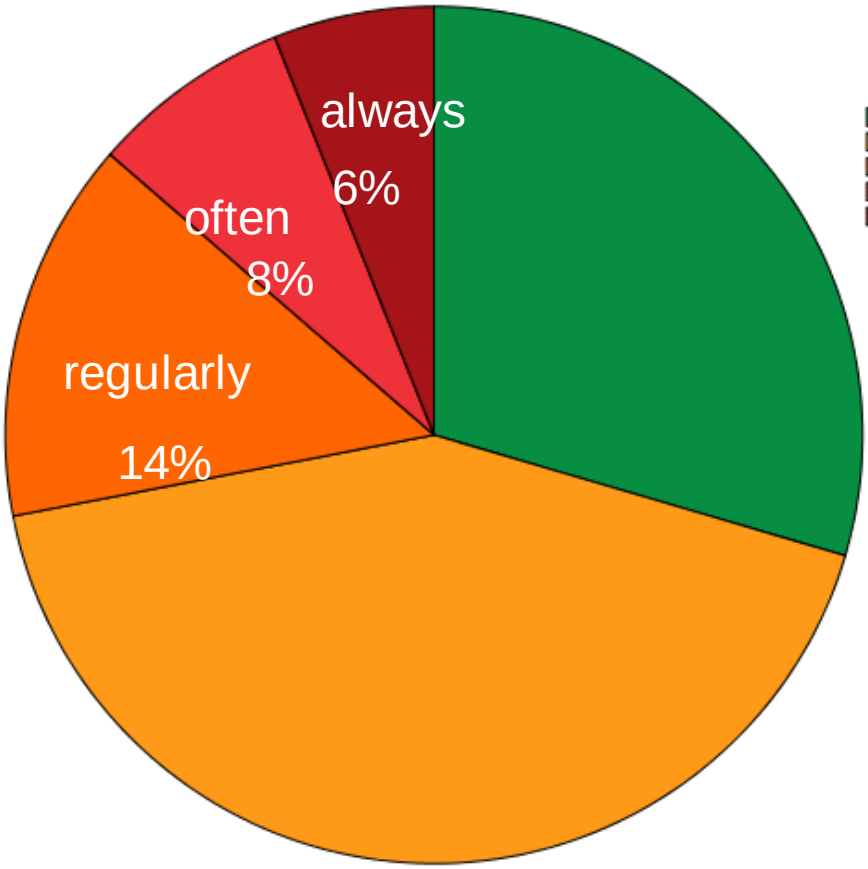
No sign. difference between PP and TP in occurence of fatigue

1b) Is seating painful?

N=265	Painful
never	30%
sometimes	42%
Regularly-always	28%



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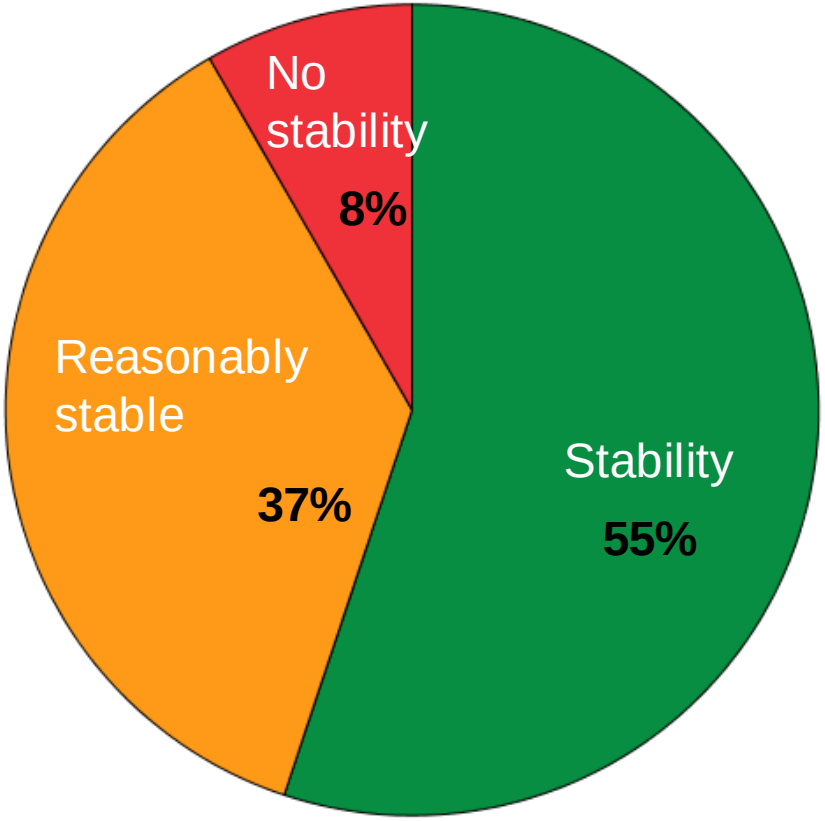
No sign. difference between PP and TP in occurence of pain

Location and severity of pain?

Location	No pain 0	Not–little severe 1-2	Moderately-very severe 3 - 4- 5
Neck	**32%**	**50%**	**18%** **n=32**
Back at shoulder height	**26%**	**48%**	**27%** **n=47**
Lower back	**32%**	**41%**	**28%** **n=50**
Side thorax	**68%**	**27%**	5%
Side lower back	**59%**	**34%**	7%
Ischial tuberositas	**45%**	**39%**	**16%**
Coccyx	**54%**	**36%**	**12%**

2a) Experiencing stability during normal seating?



Differences in TSI, age, lesion level between groups?

- older than
- Tendency of more TP in
- and

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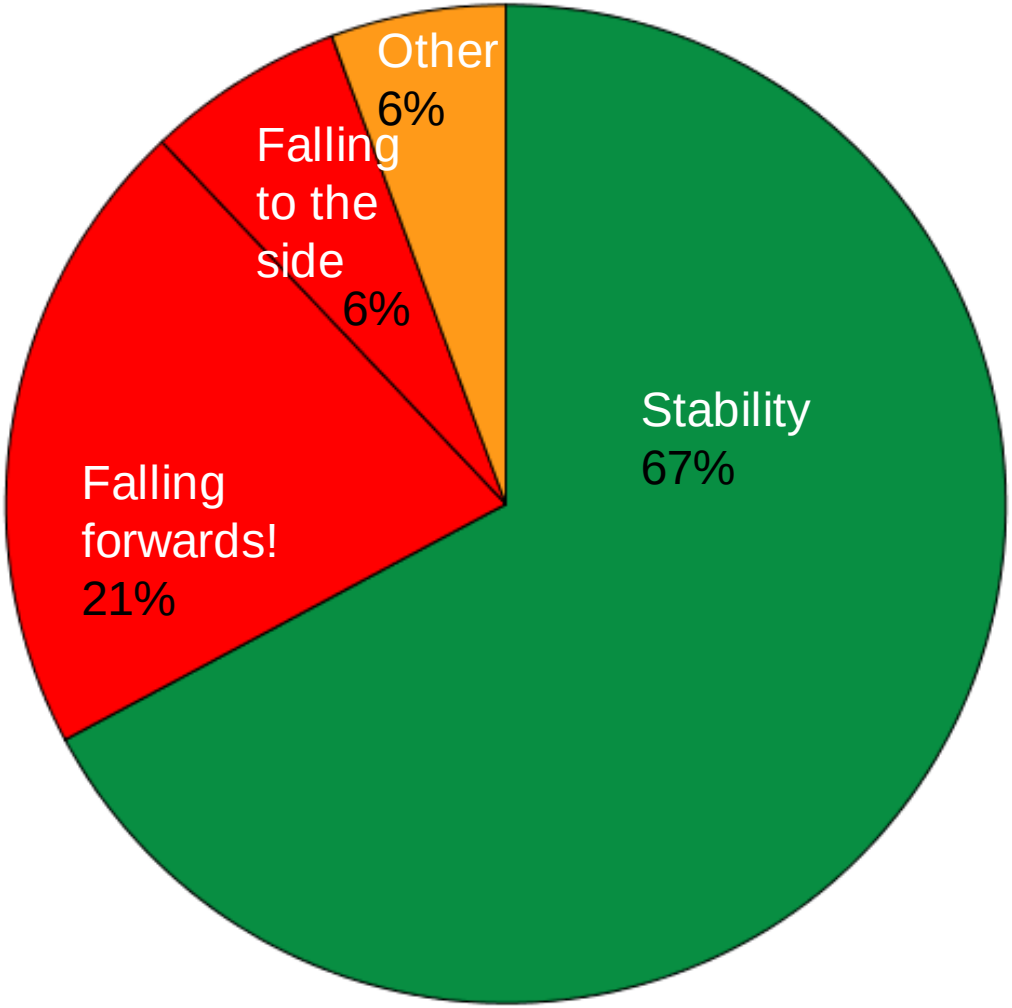
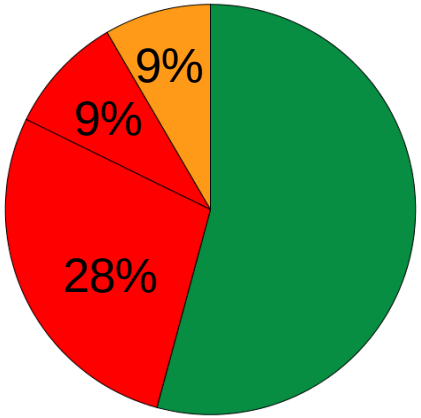
2b) Experiencing stability during reaching?



i.a.w Alm (2003): Falling sidewards and forwards are problems!

Especially in TP



3a) Is support lacking in your wheelchair?

	No	Yes	I don't know
Tetraplegia	68 %	21% (n=24)	11 %
Paraplegia	74 %	15 % (n=23)	11 %

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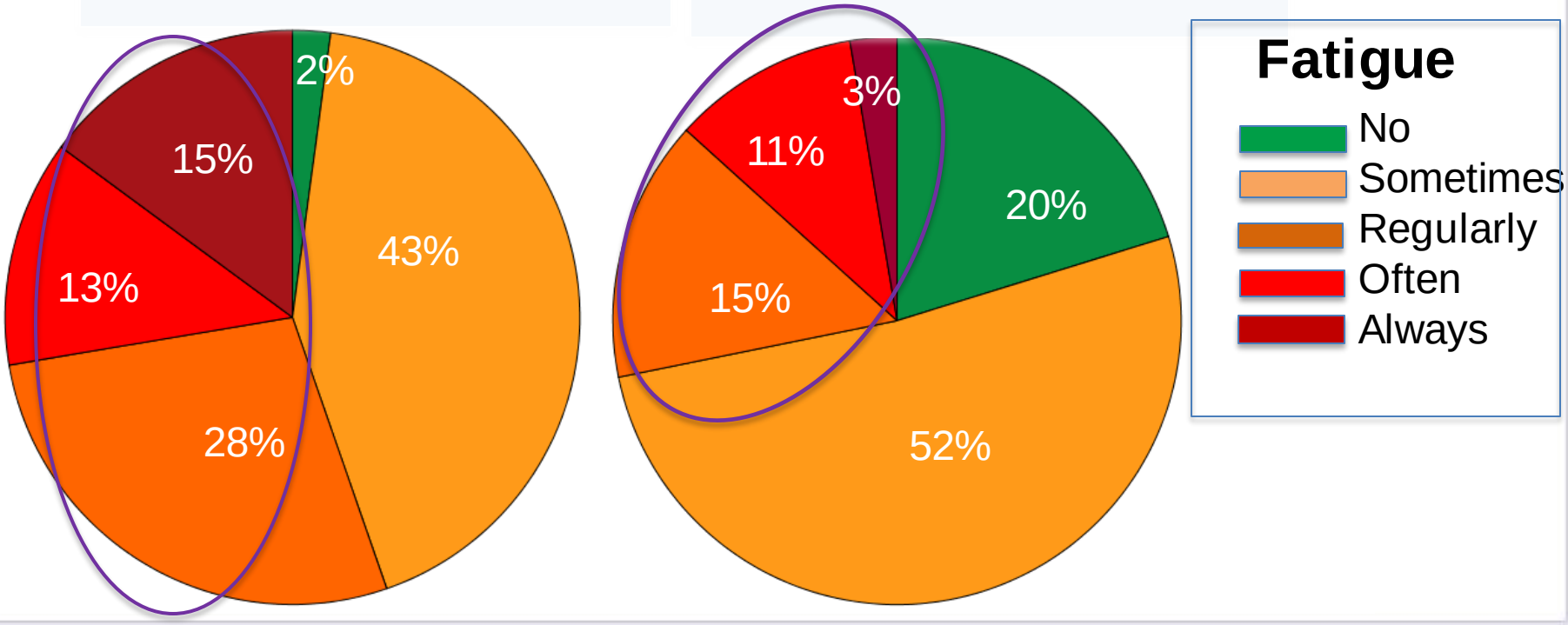
3b) At which location is support lacking?

Location	Paraplegia N=23 out of 157	Tetraplegia N=24 out of 107
Lateral to chest	0	10 persons
Back at shoulder level	8	4
Lower back	12 persons	7
Lateral lower back	9	6
Buttocks	5	0

Is fatigue related to experienced (lack of) support in the wheelchair?

Lacking support -group (n=47)

Not lacking support -group (n=188)



Satisfaction with seating in SCI

N=265	Yes	Reasonably	No
Satisfied with seating?*	**58 %**	**28 %**	**14%**
	Yes	**I don't know**	**No**
Can seating be improved?	**48%**	**24%**	**28 %**

** Alm (2003): Only 43% (n=30) satisfied*
Samuelsson (2004): 48% good nor bad, 13% bad

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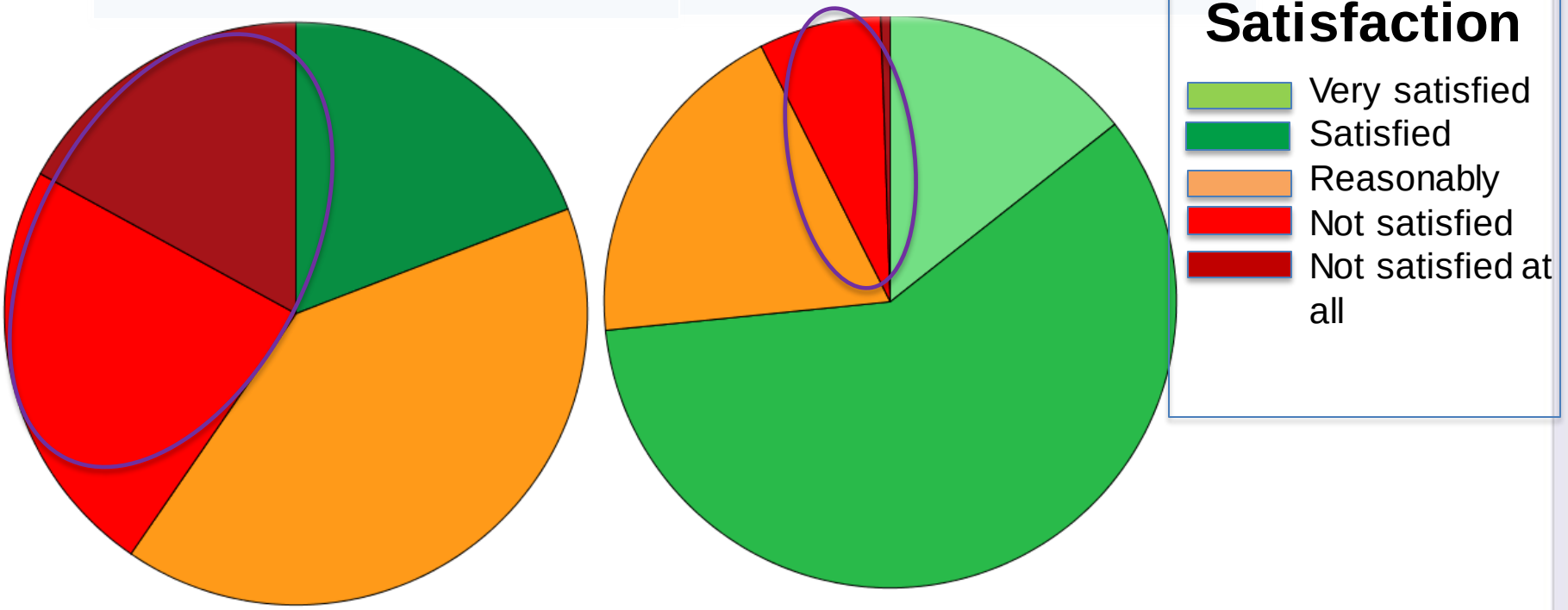
Is satisfaction related to (lack of) support in the wheelchair ?

Lacking support -group (n=47)

Not lacking support -group (n=188)



Discussion

- Are fatigue and pain and instability related to the wheelchair?
- Preliminary result: fatigue, pain and dissatisfaction seem to be more prominent in the group that lacks support in the wheelchair.
- We do not know if support is **objectively** lacking in the wheelchair!

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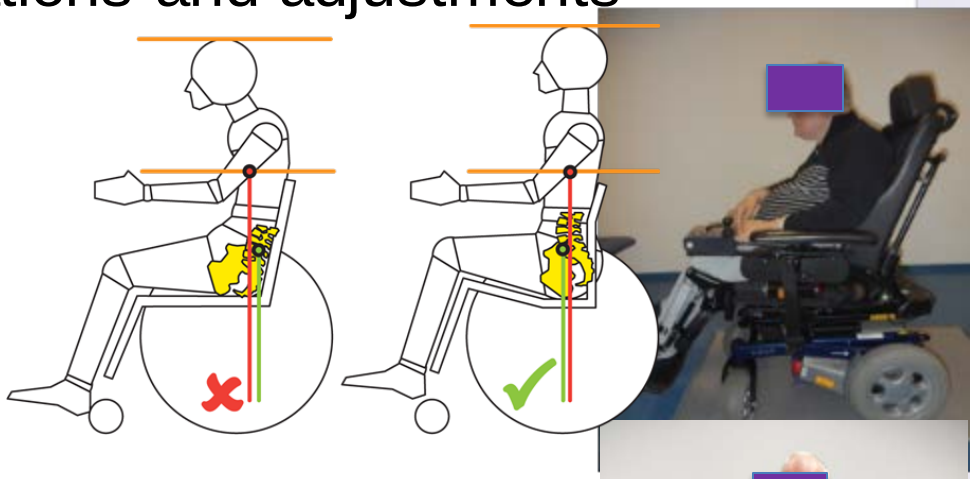
Evidence for more support

Alm et al. (2003):*

- Both the examiner's classification and the subjects' reports showed the need for a better postural alignment
- Current wheelchair specifications and adjustments seem to:
  - inhibit a postural correction towards upright sitting
  - fail to provide sufficient lateral support



*Alm, M., et al., *Clinical evaluation of seating in persons with complete thoracic spinal cord injury.* Spinal Cord, 2003. **41**(10): p. 563-71.

Clinical Relevance

Do wheelchairs always offer enough lateral trunk and back support?

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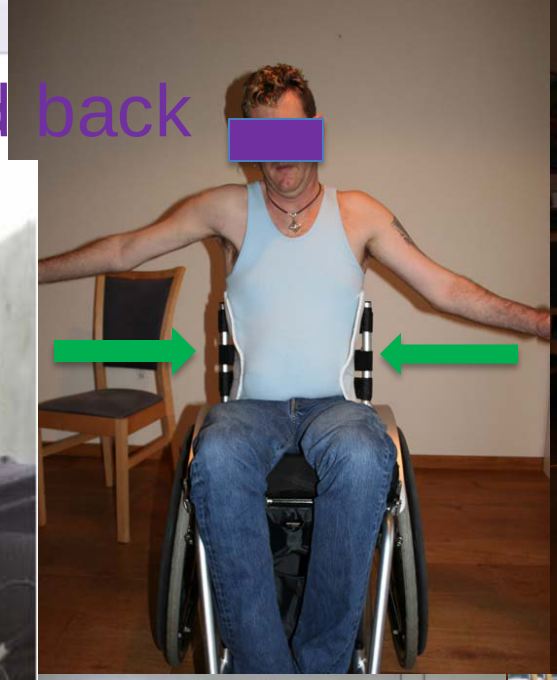
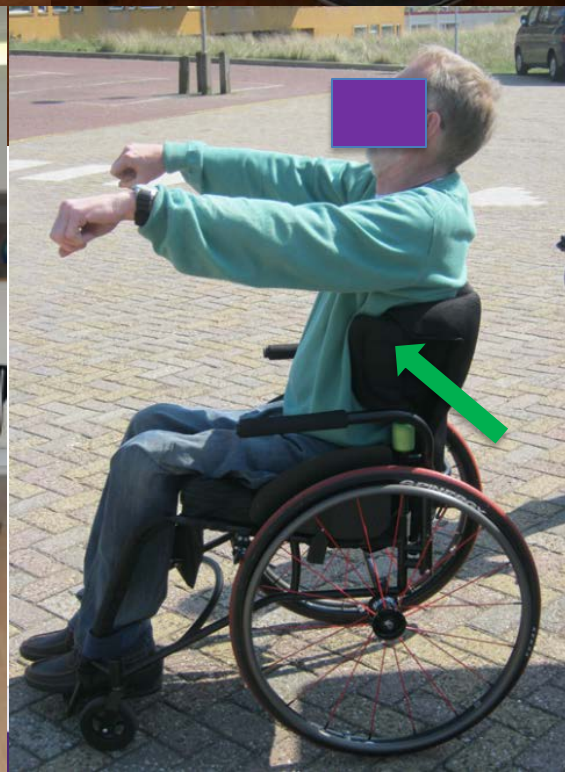
Solutions lateral and back support





Conclusions

- Persons with SCI frequently report fatigue, pain and instability during sitting.
- A majority believes their own sitting posture can be improved:
  - More support may be needed in the wheelchair in those who lack support
- Persons with SCI should be advised to have their sitting posture regularly checked, preferably by SCI-specialized seating therapists/ Seating Advisory Team.

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Intervention
Offering
more support

Seating
Advisory Team

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Thank you for your attention

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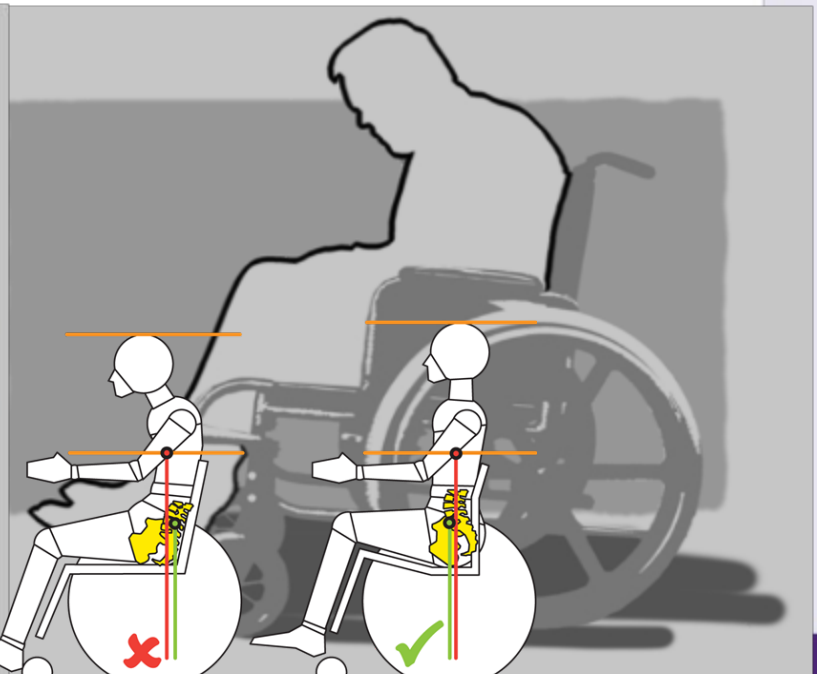
Are the ones that lack support in a certain location (e.g. lower back) also the ones that have pain in logical locations such as neck and lower back?

For example: kyfotic posture

N=19 who lack support in lower back: 12 have moderate to severe pain in lower back (reported 10 times) and/or back at shoulder height (7) and/or neck (5)



	Paraplegia		Tetraplegia		
Wheelchair	*N*	*Hours/day (mean sd)*	*N*	*Hours/day (mean sd)*	*p*
Only hand rim	146	13 ± 3.5	65	14 ± 3	*0.087*
Only powered	1	16	25	13 ± 3	*NA*
Both	3	6 ± 5 4.5 ± 4	13	10 ± 5 8 ± 5.5	*NA*

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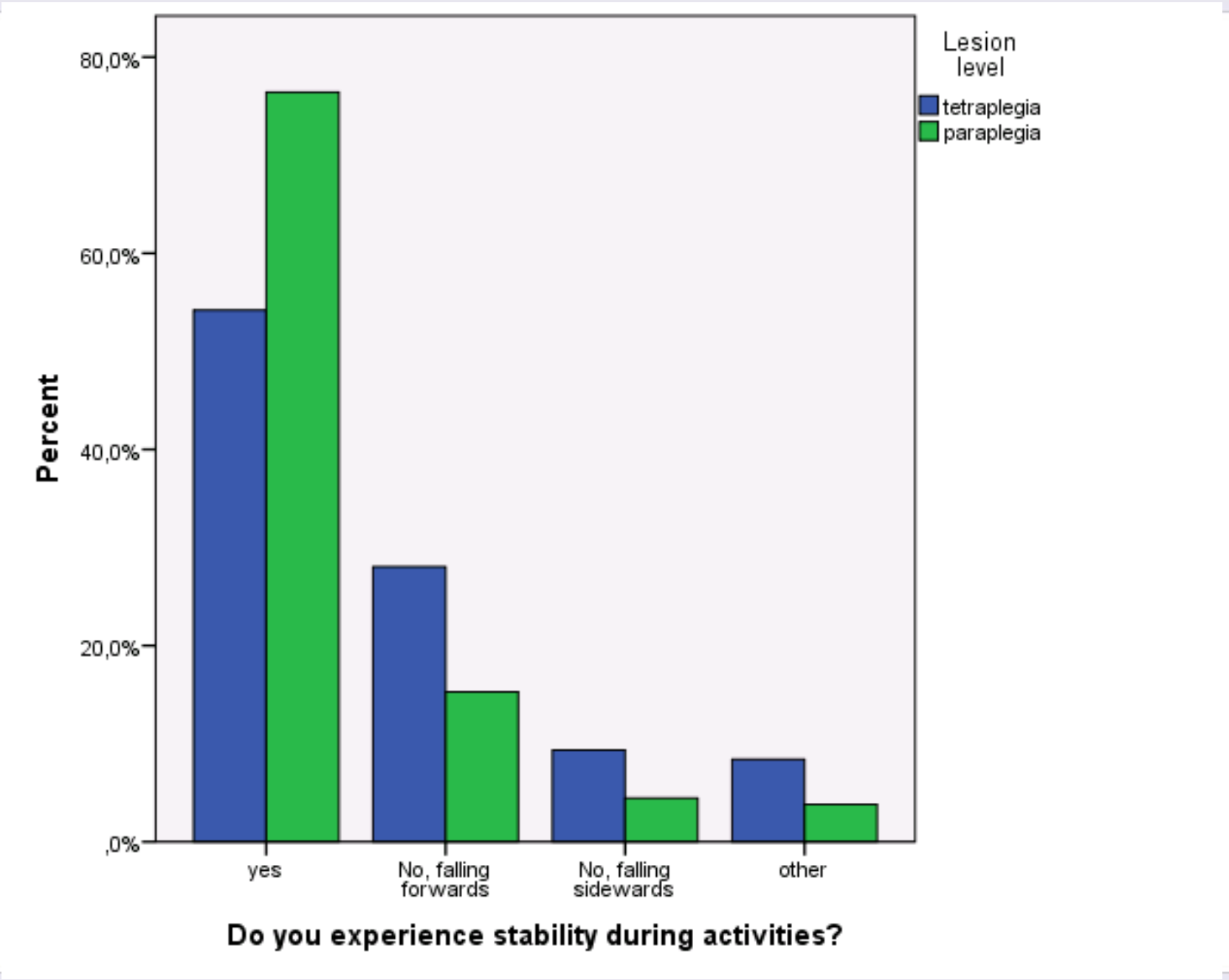
Lesion level
tetraplegia
paraplegia
Percent
80,0%
60,0%
40,0%
20,0%
,0%
yes
No, falling forwards
No, falling sidewards
other
Do you experience stability during activities?