

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	iii
ENGLISH ABSTRACT	v
THAI ABSTRACT	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER I INTRODUCTION	
Purposes and hypotheses of the study	3
Independent and dependent variables	4
CHAPTER II LITERATURE REVIEW	
Ageing	5
Walking over obstacle	11
Accelerometry in gait analysis	17
Berg Balance Scale (BBS)	21
Timed up and go test (TUG)	22
Two-dimensional (2D) motion analysis system	24
CHAPTER III METHOD	
Participants	26
Inclusion and exclusion criteria	26
Equipment	27

Experimental setup	28
Participant preparation	29
Testing protocols	31
Data reduction	32
Reliability of measurements	39
Statistical analysis	39
CHAPTER IV RESULTS	
Demographic data of the participants	40
Gait parameters of level walking	42
Gait parameters of crossing step	42
Peak trunk acceleration amplitude of level walking	44
Peak trunk acceleration amplitude of crossing step	
- Vertical direction	47
- Anteroposterior direction	48
- Mediolateral direction	49
CHAPTER V DISCUSSION	50
CONCLUSION	59
REFERENCES	60
APPENDICES	
Appendix A Personal data collection form	69
Appendix B The Berg Balance Scale (BBS)	70
Appendix C Thai Mini Mental State Examination (TMSE)	74
Appendix D Consent form	77
Appendix E Certificate of ethical clearance	78

Appendix F Reliability of the study

79

CURRICULUM VITAE

82



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

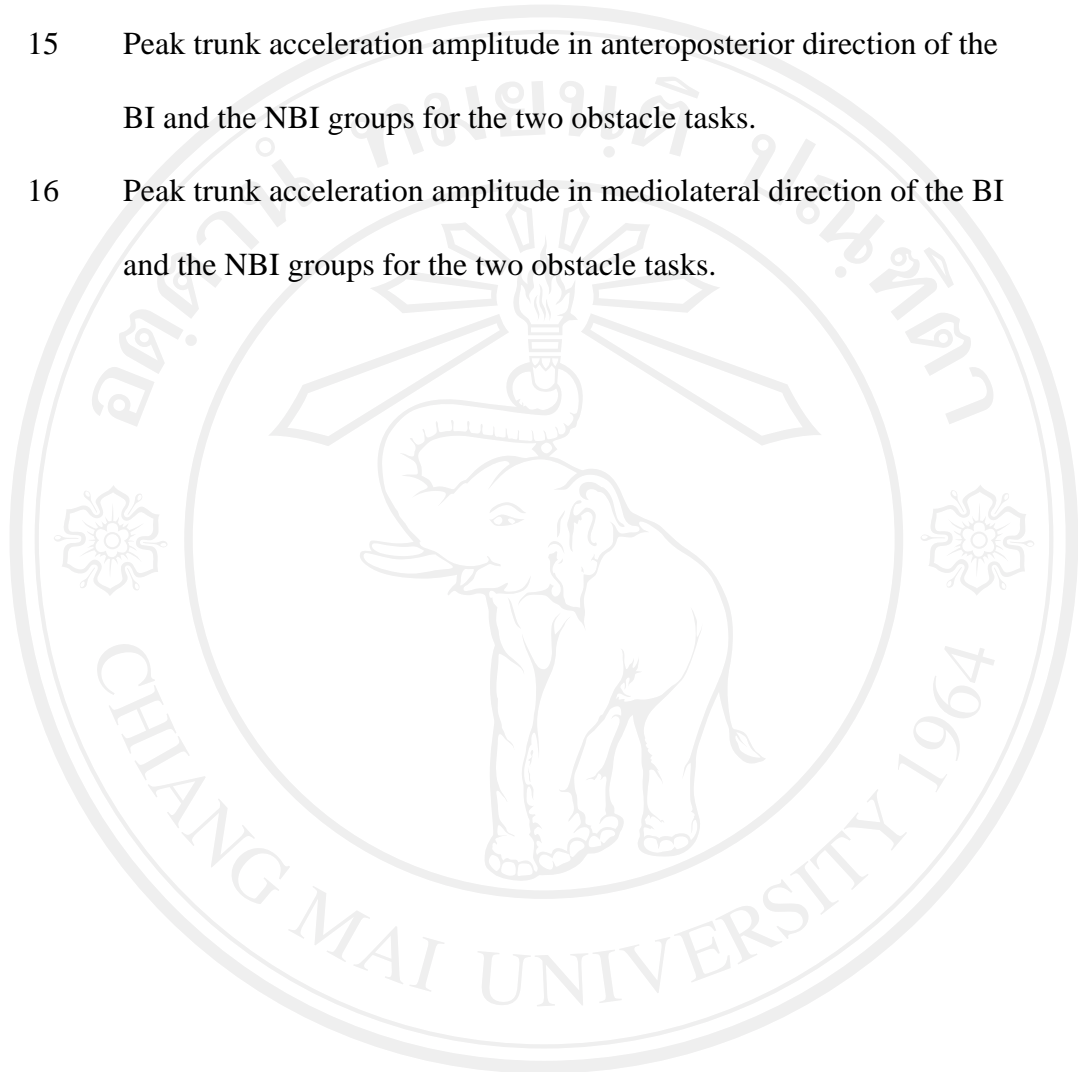
LIST OF TABLES

TABLE	PAGE
1 Demographic data of the BI and the NBI groups	41
2 Gait parameters of crossing step	43
3 Intra-class correlation coefficients for peak trunk acceleration amplitude in three directions of the NBI group	80
4 Intra-class correlation coefficients for gait parameters of crossing step in two obstacle tasks of the NBI group	81

LIST OF FIGURES

FIGURES		PAGE
1	Time dimensions of the gait cycle	10
2	Two possible references objects for two dimensional video calibration	25
3	Equipment for recording trunk acceleration	27
4	A height-adjustable obstacle	28
5	Instrument walkway	29
6	Participant preparation	30
7	Diagram of data reduction of trunk acceleration	33
8	Selection of peak trunk acceleration amplitude	34
9	Diagram of data reduction of gait parameters	35
10	Gait parameters of crossing step ((a) pre-obstacle distance, (b) leading limb elevation, (c) post-obstacle distance, (d) trailing limb elevation and (e) crossing step length	37
11	Diagram of data collection procedures	38
12	Typical trunk acceleration patterns of the BI and the NBI groups in vertical, anteroposterior and mediolateral direction during walking on level surface.	45
13	Typical trunk acceleration patterns of the BI and the NBI groups in vertical, anteroposterior and mediolateral directions during obstacle crossing of the 10% and 30%LL.	46

- | | | |
|----|---|-----------|
| 14 | Peak trunk acceleration amplitude in vertical direction of the BI and the NBI groups for the two obstacle tasks. | 47 |
| 15 | Peak trunk acceleration amplitude in anteroposterior direction of the BI and the NBI groups for the two obstacle tasks. | 48 |
| 16 | Peak trunk acceleration amplitude in mediolateral direction of the BI and the NBI groups for the two obstacle tasks. | 49 |



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved