

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

Re-thinking Drowning Risk: The Role of Water Safety Knowledge, Attitudes and Behaviours in the Aquatic Recreation of New Zealand Youth

A thesis presented in fulfilment of the requirements for the degree of

Doctor of Philosophy

at Massey University, Palmerston North, New Zealand.

Kevin Moran

2006

Abstract

This study evolved from concerns about the number of young people drowning in New Zealand (544 deaths between 1980-1994), the author's long experience with surf life saving and the suspicion that participation statistics on aquatic recreation do not adequately explain why so many young people drown. It was postulated that the risk of drowning associated with aquatic recreation also was the consequence of many underlying water safety influences that operate at intrapersonal, interpersonal and community levels. Thus the purpose of the study was to obtain comprehensive data on what young people know, think and do about their safety during aquatic recreation.

A 25-item questionnaire was designed to survey a randomised sample of New Zealand youth (2202, year 11, 15 – 19 year olds) to assess their participation in, knowledge about and behaviour during aquatic recreation. To develop the questionnaire, a conceptual framework was devised that constructed the risk of drowning as a complex phenomenon dependent on how often young people participate in various forms of water-based activities, but largely influenced by their water safety knowledge, attitudes and behaviour, all of which are shaped by social, cultural and demographic variables.

Almost all New Zealand youth had taken part in some swimming (98%) or other aquatic activity (94%) in the previous year. Risk of drowning was exacerbated among many students because they had poor water safety skills and knowledge, held unsound water safety attitudes, and often practiced at-risk behaviours. For example, many students estimated that they could not swim more than 100 m (54%), thought that swimming was acceptable at a surf beach after patrol hours (61%), and had swum outside patrol flags (61%) or never worn lifejacket (19%) during aquatic recreation. Taken separately, any one of these dispositions is capable of heightening drowning risk; taken collectively they offer strong explanation as to why youth are at greater risk of drowning than others. When analysed by gender, the lack of water safety knowledge, the prevalence of unsafe attitudes and at-risk behaviours among males was consistent and pronounced. The effect of socio-economic status and ethnicity on these risk-enhancing dispositions was less pronounced, although the data did suggest that the knowledge base of youth from low-decile schools and of Pasifika and Asian ethnicity provided least protective potential in the event of unintentional submersion.

Preface and acknowledgements

This thesis is the consequence of a lifelong interest in the promotion of water safety and the prevention of drowning. Specifically, it is the written manifestation of many years of experience of rescuing young people while lifeguarding at one of New Zealand's most dangerous surf beaches, as well as the product of many years of advocacy for the necessity of water safety education for young people.

In affording the writer the opportunity to indulge in an in-depth study of an activity that has long held a professional and personal interest, this study has been a labour of love as much as a labour of material end. As in all such work, many people have facilitated its completion at both a personal and professional level. On the personal level, I am appreciative of the tolerance and patience shown by my wife, Sian, and family, who have had to endure unremitting doubts, frustration and elation, often in the same day. On a professional level, I am deeply indebted to my supervisors, Pat Nolan and Bruce Ross, for their unfailing support and wisdom. Above all, I am indebted to both for their friendship. In addition, a special thanks is proffered to Chris Tennet for her ever-enthusiastic assistance in proof reading and unfailing ability to detect errors in writing with hawk-like precision.

The project could not have proceeded without the assistance of the principals, staff and students of the 41 schools that took part in the nationwide survey, or without the generous financial support and advice of Water Safety New Zealand that made the survey possible. I am also grateful for the professional advice and support of other water safety organizations including Surf Life Saving Northern, Surf Lifesaving New Zealand, and WaterSafe Auckland Incorporated.

Finally, I acknowledge the assistance of the Auckland College of Education Research Grants Committee and the Massey University Post Graduate Research Committee by making funds available to assist with the completion of the study.

Lucent in tenebris

Table of Contents

	Page no.
Title Page	i
Abstract	ii
Preface and acknowledgements	iii
Table of Contents	iv-v
List of Tables Figures	vi-vii
List of Figures	viii
Part 1. Introduction	1-56
1 Chapter One - Introduction	1-28
1.1 Background	2-5
1.2 Purpose of the Study	6-7
1.3 Theoretical Perspective on Drowning Risk	8
1.3.1 The nature of youth aquatic recreation	8-9
1.3.2 Water safety knowledge, attitudes and behaviours (K-A-B)	10-15
1.3.3 Formative socio-cultural factors influencing youth water safety	15-17
1.3.4 Social demographic variables	17-19
1.4 Conceptual Framework	20-21
1.5 Research Design	22-27
1.6 Summary	28
2 Chapter 2 - Method	29-56
2.1 Introduction	29-30
2.2 Development of the Survey Questionnaire	31-37
2.3 Preliminary Testing	38
2.3.1 Pilot study 1	38-39
2.3.2 Pilot study 2	39-40
2.3.3 Pilot studies 3 and 4	40-43
2.3.4 Peer review	43-44
2.3.5 Final questionnaire	44-45
2.4 Development of the Survey Process	46
2.4.1 Survey population	46-47
2.4.2 Sampling technique	47-49
2.4.3 Ethical considerations	50-51
2.5 Administration of the Survey	52
2.5.1 Pre-survey administration	52
2.5.2 Survey administration	52-53
2.6 Data Processing and Analysis	53
2.6.1 Data entry and storage	53-54
2.6.2 Data analysis and presentation	54-56
2.7 Summary	56
Part 2. Results	57-115
Overview	58-59
3 Chapter 3 – Aquatic Recreation and Behaviour - What Students Do	59-75
3.1 Swimming Activity: Where and how often	60-64

	Page no.
3.2	Swimming Behaviour 64-68
3.3	Aquatic Recreational Activities: What and How Often 69-72
3.4	Aquatic Recreation Behaviour 72-75
4	Chapter 4 – Water Safety Knowledge -What Students Know 76-88
4.1	Swimming Ability 76-79
4.2	Rescue Ability 79-81
4.3	Resuscitation Ability 81-82
4.4	Knowledge of Small Boat Safety 82-85
4.5	Knowledge of Surf Safety 86-88
5	Chapter 5 – Perception of Drowning Risk and Water Safety Attitudes - What Students Think 89-100
5.1	Perceptions of Drowning Risk 89-93
5.2	Water Safety Attitudes 94-100
6	Chapter 6 – Socio-cultural Influences on Youth Water Safety Knowledge, Attitudes and Behaviour 101-115
6.1	Student Perceptions on Important Influences on Water Safety 101-103
6.2	Peer Influences 103-105
6.3	Familial Influences 105-107
6.4	Educational Influences 107-110
6.5	Previous Experience of Aquatic Danger 110-112
6.6	Summary of Results 112
6.6.1	Aquatic activities: What students do 112-113
6.6.2	Swimming and water safety knowledge: What students know 113
6.6.3	Drowning risk perception and water safety attitudes: What students think 113-114
6.6.4	Socio-cultural influences on youth water safety 114-115
Part 3	Discussion and Conclusion 116-171
7	Chapter 7 - Discussion 117-154
7.1	Aquatic Recreation and Exposure to Drowning Risk 117-123
7.2	Water Safety Knowledge 124-134
7.3	Water Safety Perceptions, Attitudes and Behaviours 135-147
7.4	Socio-cultural Influences on Water Safety K-A-B 148-154
7.5	Summary 154
8	Chapter 8 - Conclusions 155-171
8.1	Key Findings 155
8.1.1	The nature and extent of aquatic activity 155-156
8.1.2	Water safety knowledge, attitudes and behaviours 156-160
8.1.3	Socio-cultural influences on water safety 160-162
8.2	Implications 163-166
8.3	Future Research 167-169
8.4	Final Comment 170-171
	References 172-183
	Appendices 1-42
	Appendix 1 - The Questionnaire and ethics protocols 2-15
	Appendix 2 - Tables of Significance Tests 16-48

List of Tables

		Page no.
Table 1	Inter-correlations between swimming activity reported in Pilot studies 3 and 4	41
Table 2	Inter-correlations between other aquatic activities reported in Pilot studies 3 and 4	41
Table 3	Inter-correlations between drowning risk perceptions reported in Pilot studies 3 and 4	42
Table 4	Inter-correlations between water safety attitudes reported in Pilot studies 3 and 4	42
Table 5	Year 11 student population by school type and location, July 2002	47
Table 6	Stratified sampling frame by school type and location, July 2002	48
Table 7	Composition of the stratified sample by school type and location, July 2002	49
Table 8	Characteristics of the sample of by gender, region and length of residency, socio-economic status and ethnicity, April 2003	59
Table 9	Location and frequency of student swimming activity in the previous year	61
Table 10	Location and frequency of student swimming activity by gender	62
Table 11	Location and frequency of student swimming activity by socio-economic status via decile rating of school attended	63
Table 12	Location and frequency of student swimming activity by ethnicity	64
Table 13	Student self-reported behaviours during swimming activity	65
Table 14	Student self-reported behaviours during swimming activity by gender	66
Table 15	Student self-reported behaviours during swimming activity by socio-economic status via decile rating of school attended	67
Table 16	Student self-reported behaviours during swimming activity by ethnicity	68
Table 17	Other student aquatic recreation activity in the previous year	69
Table 18	Other student aquatic recreation activity by gender	70
Table 19	Other student aquatic recreation by socio-economic status via decile rating of school attended	71
Table 20	Student self-reported behaviour during aquatic recreation in the previous year	72
Table 21	Student self-reported behaviour during aquatic recreation by gender	73
Table 22	Student self-reported behaviour during aquatic recreation by ethnicity	74
Table 23	Swimming ability in seven distance categories by gender	76
Table 24	Swimming ability by socio-economic status via decile rating of school attended	77
Table 25	Swimming ability by ethnicity	78
Table 26	Relationship between swimming ability, aquatic activity and associated at-risk behaviours	79
Table 27	Rescue ability by gender, socio-economic status via decile rating of school attended and ethnicity	80
Table 28	Resuscitation (CPR) ability by gender, socio-economic status via decile rating of school attended and ethnicity	81

		Page no.
Table 29	Small boat safety knowledge expressed in terms of safety items, boat safety preparation and on-board safety rules	83
Table 30	Small boat safety knowledge by gender	84
Table 31	Small boat safety knowledge by socio-economic status via decile rating of school attended	84
Table 32	Small boat safety knowledge by ethnicity	85
Table 33	Surf safety knowledge expressed in terms of surf hazard identification, safety decisions and safety of location	86
Table 34	Surf safety knowledge by gender	87
Table 35	Surf safety knowledge by socio-economic status via decile rating of school attended	87
Table 36	Surf safety knowledge by ethnicity	88
Table 37	Student perceptions of drowning risk	89
Table 38	Student perceptions of drowning risk by gender	90
Table 39	Student perceptions of drowning risk by socio-economic status via decile rating of school attended	91
Table 40	Student perceptions of drowning risk by ethnicity	92
Table 41	Relationship between perceptions of drowning risk, participation in aquatic recreation, water safety knowledge and behaviours	93
Table 42	Student attitudes towards water safety	94
Table 43	Student attitudes towards water safety by gender	96
Table 44	Student attitudes towards water safety by socio-economic status via decile rating of school attended	97
Table 45	Student attitudes towards water safety by ethnicity	98
Table 46	Relationship between water safety attitudes and components of water safety knowledge	99
Table 47	Relationship between water safety attitudes, behaviour and drowning risk	100
Table 48	The three most important influences on water safety knowledge by gender	101
Table 49	The most important influence on water safety by socio-economic status via decile rating of school attended and ethnicity	102
Table 50	Observation of peer behaviours by gender, socio-economic status via decile rating of school attended and ethnicity	103
Table 51	Familial influences on water safety by gender, socio-economic status via decile rating of school attended and ethnicity	105
Table 52	The teaching of swimming by gender, socio-economic status via decile rating of school attended and ethnicity	108
Table 53	The teaching of water safety topics by gender, socio-economic status via decile rating of school attended and ethnicity	109
Table 54	Experience of a life-threatening aquatic incident and rescue by gender, socio-economic status via decile rating of school attended and ethnicity	110
Table 55	Effect of life-threatening experience on aquatic activity participation by gender, socio-economic status and ethnicity	111

List of Figures	Page no.	
Figure 1	Factors influencing the risk of drowning among youth as a consequence of their participation in aquatic recreation	20
Figure 2	Survey questions on exposure to drowning risk by frequency and type of activity and their relationship to the conceptual framework reproduced from Figure 1	32
Figure 3	Survey questions on water safety knowledge, attitudes and behaviours (K-A-B) and their relationship to the conceptual framework reproduced from Figure 1	33
Figure 4	Survey questions on socio-cultural influences on water safety K-A-B and their relationship to the conceptual framework reproduced from Figure 1	35