



Factors affecting adherence to pre-dive checklists: A nested study

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BACKGROUND

- The importance of using checklists for injury prevention is well established.
- The use of pre-dive checklists in scuba diving may prevent diving-related injuries and fatalities.
- Prevalence of pre-dive checklist use in recreational diving is very low.
- For the promotion of checklists, it is vital to identify the divers who adhere and those who do not adhere to pre-dive checklist when provided.
- Identifying target groups will allow developing strategies for promoting checklist use.

OBJECTIVE

To evaluate the factors associated with adherence to pre-dive checklist in recreational scuba divers

DATA COLLECTION METHODS

- Nested prospective observational study
- Parent Study - cluster randomized trial to study the effect of using a pre-dive checklist (investigator developed), on the incidence of scuba diving mishaps among recreational scuba divers.
- Data was used only from the intervention group of the parent study
- Study conducted at four locations in the Atlantic and Caribbean
- Intervention group data collected over 40 location-days

ELIGIBILITY

Minimum age – 18 years, valid diver certification, planning to dive on the day of participation, deemed fit-to-dive by the dive operator

WHO WAS ADHERENT?

Three criteria to determine adherence; all must be met

1. Must report starting tank pressure of the first dive on the checklist
2. Must write a pre-dive plan on the checklist
3. Must check at least 10 checkboxes on the checklist

STATISTICAL METHODS

- Descriptive statistics are reported using tables and frequencies.
- Exploratory logistic regression models to evaluate the odds of being adherent
- Generalized estimating equations to address the non-independence of adherence among participants diving on the same day at the same location

Table 1: Distribution of participant characteristics

Variables	Categories	Divers			
		Adherent	Non-adherent	Total	%
Sex	Male	291	117	408	66.1
	Female	139	70	209	33.9
Age	18-35 years	120	78	198	32.1
	> 35 years	310	109	419	67.9
Race	White	407	172	579	93.8
	Non-White*	23	15	38	6.2
Location	North Carolina	81	60	141	22.8
	Caribbean	349	127	476	77.2
Average	0-5 dives	173	91	264	42.8
	6-10 dives	81	23	104	16.9
Yearly Dives	11-15 dives	44	21	65	10.5
	16-20 dives	48	16	64	10.4
Written self-checklist	>20 dives	84	36	120	19.4
	Yes	31	5	36	5.8
	No	399	182	581	94.2
All participants		430 (69.7%)	187 (30.3%)	617	100

Table 2: Odds ratio for factors influencing adherence to pre-dive checklist

Variables	Categories	Adherence Odds ratio (95% CI)	
		Univariate	Multivariate
Self-Checklist (ref= None)	Written	2.67 (1.05, 6.74)	2.48 (0.95, 6.44)
Race (ref = White)	Non-White	0.59 (0.30, 1.11)	0.54 (0.27, 1.09)
Sex (ref=Male)	Female	0.81 (0.57, 1.15)	0.77 (0.54, 1.12)
Age (ref=18-35 years)	> 35 years	1.86 (1.31, 2.64)	1.67 (1.15, 2.42)
	6-10	1.76 (1.03, 2.99)	1.87 (1.09, 3.21)
Average yearly dives (ref=0-5 dives)	11-15	1.20 (0.67, 2.12)	1.17 (0.62, 2.20)
	16-20	1.74 (1.05, 2.89)	1.59 (0.95, 2.67)
	> 20	1.24 (0.78, 1.96)	1.14 (0.69, 1.89)
Location (ref = Caribbean)	North Carolina	0.46 (0.23, 0.91)	0.42 (0.20, 0.85)

RESULTS

- > 30% participants were non-adherent
- Divers own pre-dive checklist use increased odds of adherence to the intervention checklist by 150%
- Older age (> 35 years) increased odds of adherence by 70%
- Odds of adherence were lower among non-white divers by 45% as compared to Whites
- Odds of adherence were lower among NC divers by 58% as compared to Caribbean divers.

CONCLUSIONS

- Factors associated with increased odds of adhering to the intervention checklist – divers own pre-dive checklist use, older age (> 35 years), higher average annual dives (> 5 dives/ year)
- Factors associated with decreased odds of adhering to the intervention checklist – female sex, non-white race, diving location (NC vs Caribbean)

RECOMMENDATIONS

- Importance of pre-dive checklists must be explained to divers more comprehensively
- Divers should be targeted at an early age and older divers should lead by example
- Pre-dive checklists should become an integral part of diving safety culture

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