

Objective

To evaluate the effectiveness of a web-based PNF intervention and its components (Normative Feedback and Consequences Feedback) in reducing alcohol use and negative consequences among college students with different motivation levels for receiving the intervention.

Methods

Design

- Four-arm Pragmatic Randomized Controlled Trial

Participants

- Recruitment:** From September 2015 to December 2016, through e-mail and social media
- Inclusion Criteria:** College students; aged 18 to 30 years; alcohol use during the last 3 months

Intervention

- Control** = Assessment Only
- Personalized Normative Feedback:**
 - Drinking Profile (AUDIT, binge, BAC)
 - Normative comparisons
 - Alcohol consequences
 - Practical costs (money, calories)
 - Strategies to reduce risks

Normative Feedback

Consequences Feedback

Outcomes

- AUDIT score, number of typical drinks, maximum number of drinks, and number of consequences

Data Analysis

- Generalized Mixed Models with linear or ordered logit distributions adjusted by: sex, age, region, AUDIT-C, baseline data, and subject (random effect)
- Two paradigms:** observed cases and attrition models (Multiple Imputation and Pattern-mixture model)

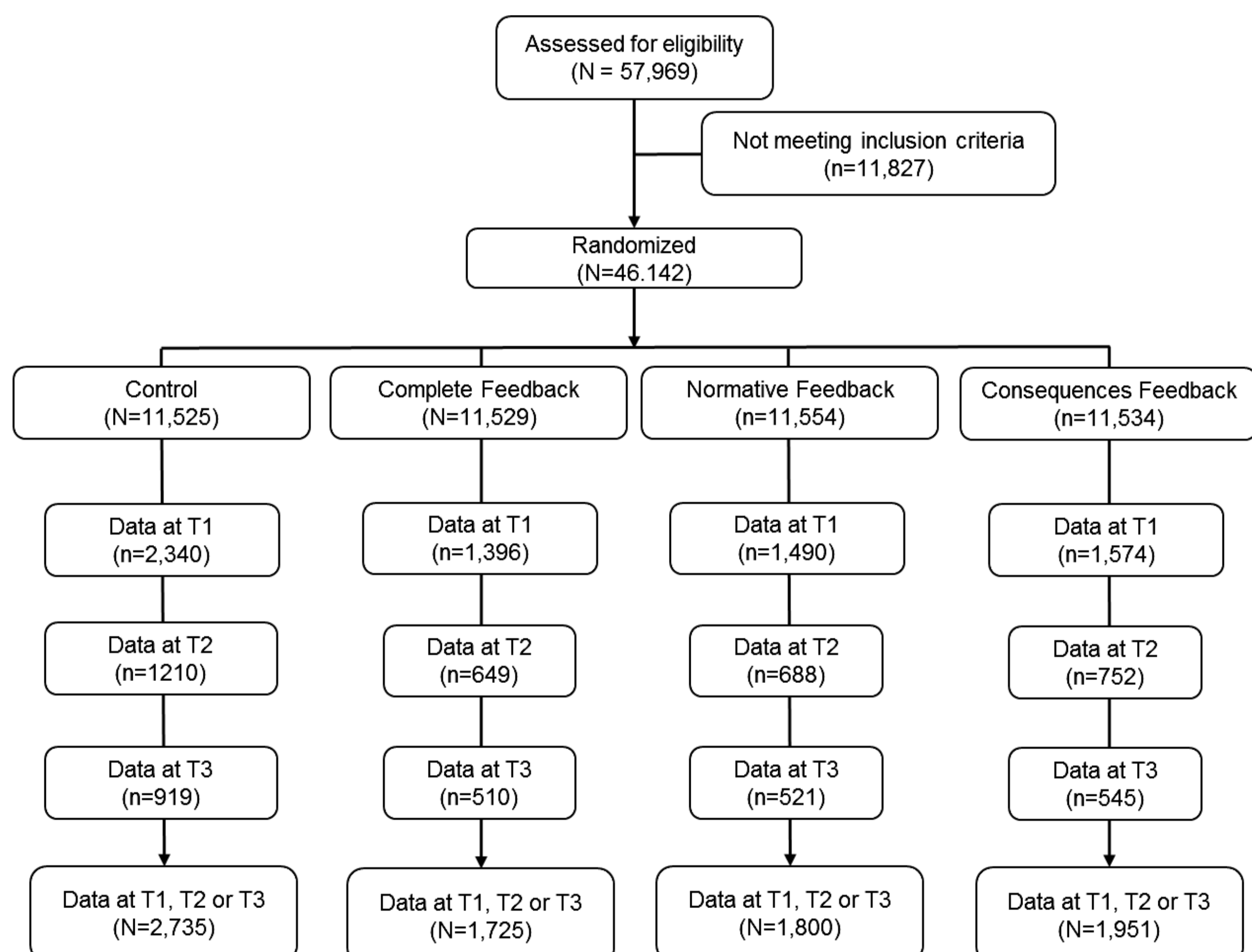
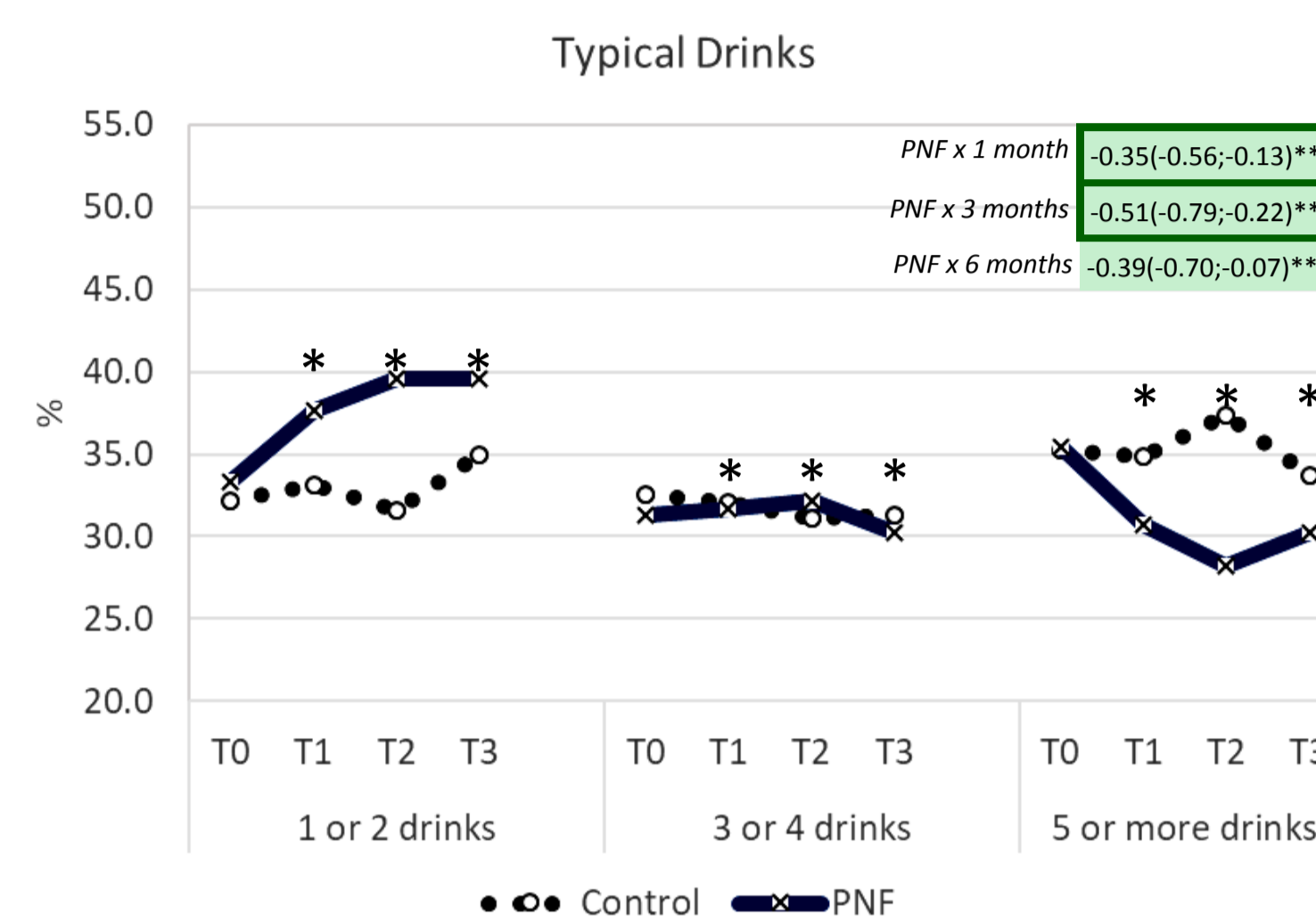


Table 1 - Baseline characteristics by intervention group.

	Control n=2,735	PNF n=1,725	Full Sample		Total N=8,211	
			NF n=1,800	CF n=1,951		
Female - n(%)	1,436(52.5)	902(52.3)	911(50.6)	1,011(51.8)	4,260(52.0)	
Age - mean(SD)	21.9(3.0)	21.8(3.0)	21.7(2.9)	21.8(2.9)	21.8(3.0)	
Motivation - n(%)						
	<i>Motivated</i>	2,192(80.2)	1,360(78.8)	1,435(79.7)	1,535(78.7)	6,522(79.4)
AUDIT-C - n(%)						
	<i>at risk drinking</i>	1,573(57.5)	991(57.5)	1,033(57.4)	1,166(59.8)	4,763(58.0)
AUDIT Score - mean(SD)	5.6(4.4)	5.4(4.4)	5.6(4.3)	5.7(4.5)	5.6(4.4)	
Maximum drinks - mean(SD)	6.9(6.1)	6.9(6.1)	6.8(6.2)	7.2(6.2)	6.9(6.2)	
Number of consequences - mean(SD)	1.3(1.6)	1.3(1.6)	1.3(1.6)	1.3(1.6)	1.3(1.6)	
Typical drinks - n(%)						
	1 or 2	881(32.2)	574(33.3)	595(33.1)	584(29.9)	2,634(32.1)
	3 or 4	889(32.5)	540(31.3)	569(31.6)	635(32.6)	2,633(32.1)
	5 or more	965(35.3)	611(35.4)	636(35.3)	732(37.5)	2,944(35.9)

Results

Intervention Effects

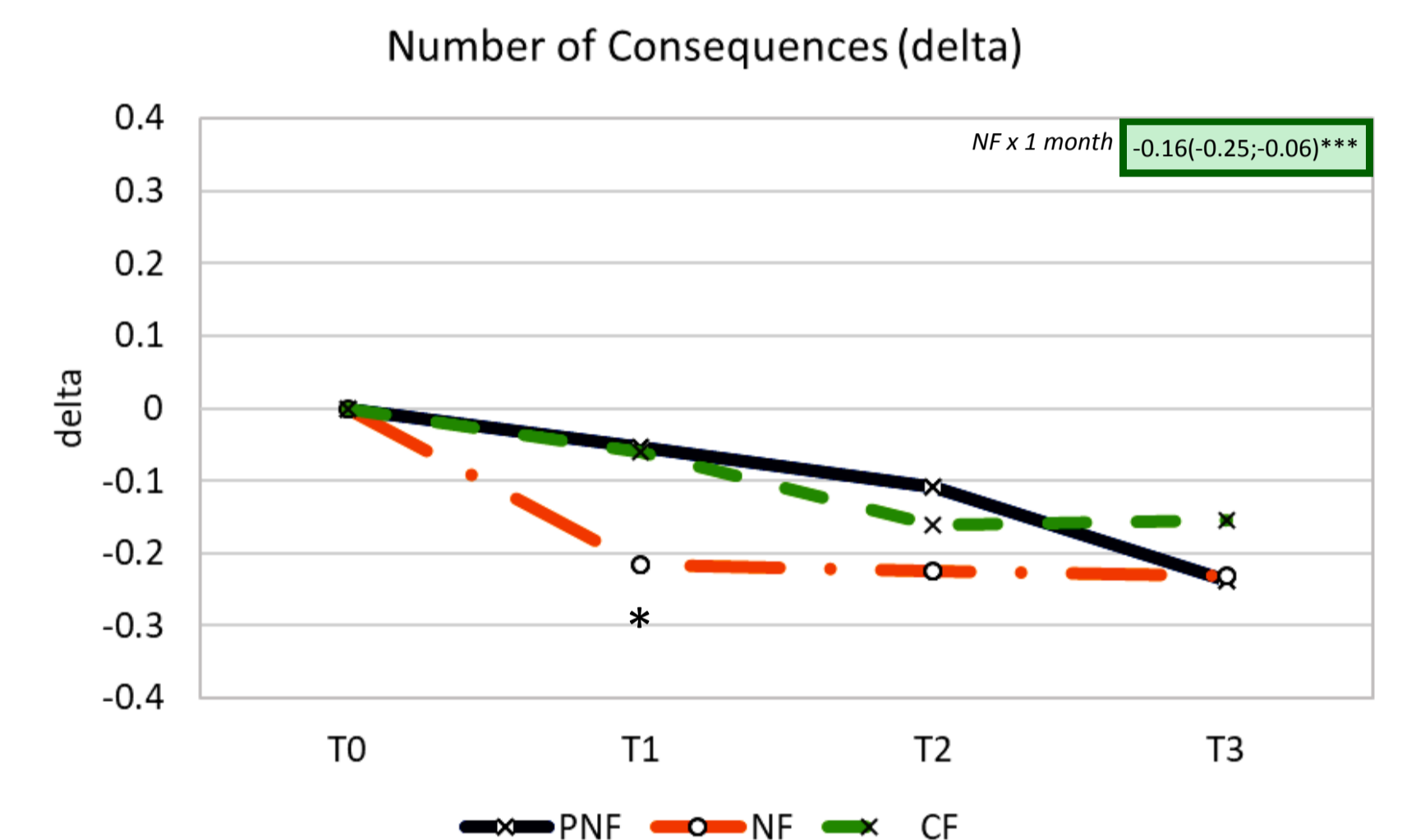
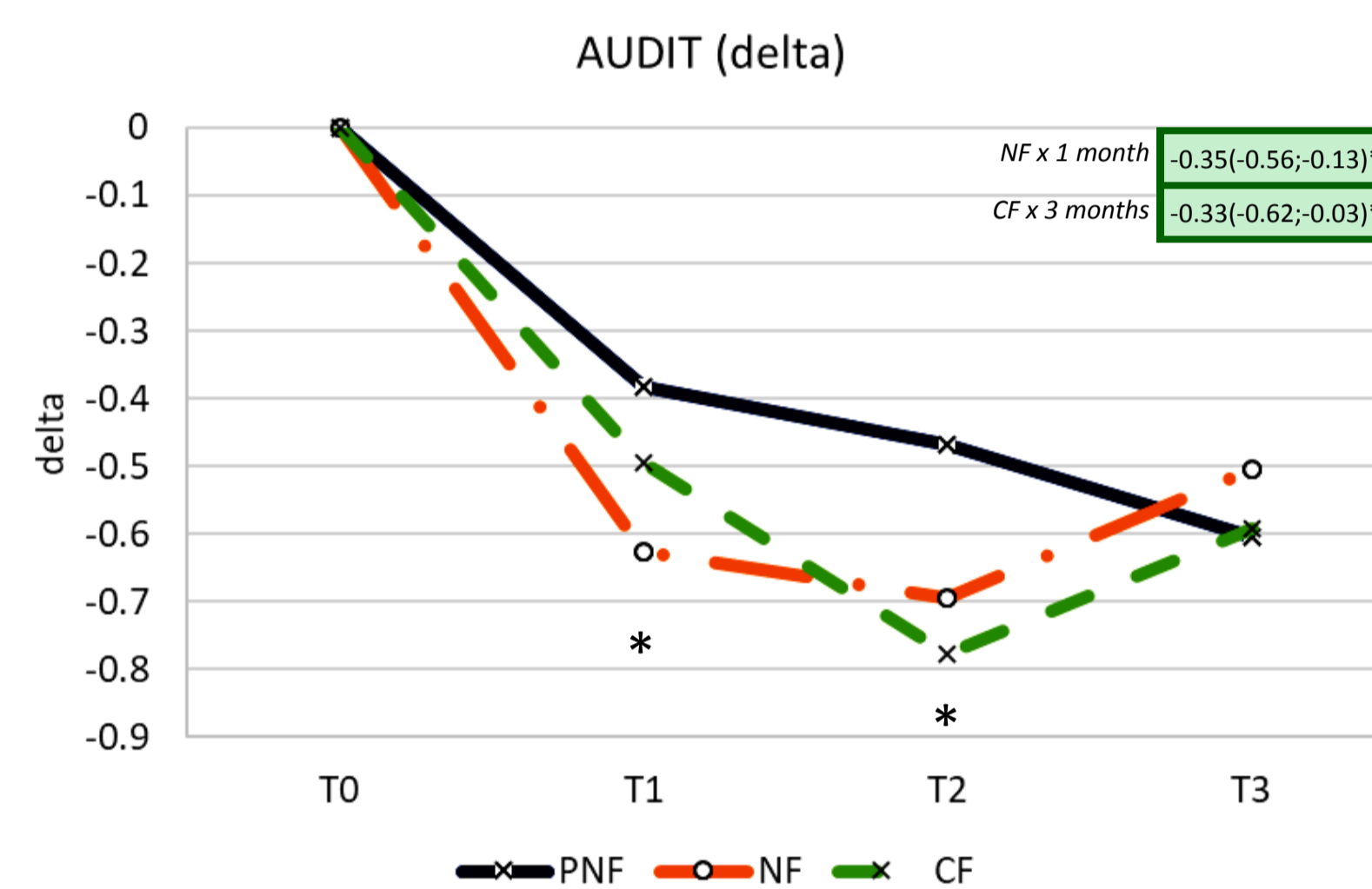


Subgroup Analysis by Motivation

Table 2 – PNF effects among low motivated and motivated students from baseline to 1, 3 and 6 months.

	b(95%CI)	Low Motivated (N=908)	Motivated (N=3,552)
		b(95%CI)	b(95%CI)
AUDIT Score (delta)			
PNF x 1 month	0.20(-0.33;0.73)	-0.16(-0.37;0.06)	
PNF x 3 months	0.53(-0.17;1.23)	-0.03(-0.30;0.24)	
PNF x 6 months	1.49(0.74;2.24)***	-0.38(-0.68;-0.08)*	
Typical drinks			
PNF x 1 month	0.32(-0.17;0.81)	-0.51(-0.76;-0.27)***	
PNF x 3 months	-0.13(-0.81;0.55)	-0.60(-0.91;-0.29)***	
PNF x 6 months	0.47(-0.25;1.20)	-0.58(-0.93;-0.23)***	
Maximum number of drinks (delta)			
PNF x 1 month	0.22(-0.55;0.98)	-0.47(-0.81;-0.12)**	
PNF x 3 months	0.63(-0.38;1.64)	-0.27(-0.71;0.16)	
PNF x 6 months	0.78(-0.31;1.86)	-0.38(-0.87;0.10)	
Number of consequences (delta)			
PNF x 1 month	0.06(-0.14;0.26)	0.01(-0.09;0.11)	
PNF x 3 months	0.27(0.01;0.53)*	0.07(-0.05;0.19)	
PNF x 6 months	0.34(0.06;0.62)*	-0.14(-0.28;-0.01)*	

Components Effects



Subgroup Analysis by Motivation

Table 3 – Components effects among low motivated and motivated students from baseline to 1, 3 and 6 months.

	b(95%CI)	Low Motivated (N=1,146)	Motivated (N=4,330)
		b(95%CI)	b(95%CI)
AUDIT Score (delta)			
NF x 1 month	-0.51(-1.08;0.06)	-0.16(-0.40;0.09)	
NF x 3 months	-0.88(-1.66;-0.10)*	-0.05(-0.37;0.27)	
NF x 6 months	-0.52(-1.34;0.30)	0.24(-0.12;0.60)	
CF x 1 month	-0.13(-0.69;0.43)	-0.09(-0.33;0.16)	
CF x 3 months	-1.19(-1.91;-0.47)***	-0.12(-0.43;0.20)	
CF x 6 months	-1.48(-2.28;-0.68)***	0.40(0.05;0.76)*	
Typical drinks			
NF x 1 month	-0.09(-0.62;0.43)	0.22(-0.04;0.49)	
NF x 3 months	-0.14(-0.87;0.60)	0.30(-0.04;0.64)	
NF x 6 months	-0.35(-1.12;0.43)	0.56(0.18;0.94)***	
CF x 1 month	-0.34(-0.85;0.17)	0.26(0.00;0.52)*	
CF x 3 months	-0.37(-1.07;0.33)	-0.04(-0.38;0.30)	
CF x 6 months	-0.59(-1.35;0.17)	0.27(-0.11;0.65)	
Maximum number of drinks (delta)			
NF x 1 month	-0.01(-0.82;0.81)	0.10(-0.29;0.48)	
NF x 3 months	-1.28(-2.40;-0.16)*	0.20(-0.30;0.70)	
NF x 6 months	-1.15(-2.33;0.03)	0.67(0.11;1.22)*	
CF x 1 month	-0.25(-1.05;0.56)	0.27(-0.12;0.65)	
CF x 3 months	-1.27(-2.30;-0.23)*	-0.22(-0.72;0.27)	
CF x 6 months	-1.33(-2.48;-0.18)*	0.47(-0.09;1.02)	
Number of consequences (delta)			
NF x 1 month	-0.26(-0.47;-0.05)*	-0.13(-0.24;-0.02)*	
NF x 3 months	-0.30(-0.58;-0.02)*	0.20(-0.30;0.70)	
NF x 6 months	-0.07(-0.37;0.23)	0.67(0.11;1.22)*	
CF x 1 month	0.01(-0.19;0.22)	0.27(-0.12;0.65)	
CF x 3 months	-0.38(-0.64;-0.11)**	-0.22(-0.72;0.27)	
CF x 6 months	-0.38(-0.67;-0.09)**	0.47(-0.09;1.02)	

Conclusions

1) PNF effectiveness:

- An internet-based PNF intervention was effective in reducing alcohol consumption among college students after 1 and 3 months, compared to a control group

2) Components effectiveness:

- CF was more effective than PNF in reducing AUDIT score after 3 months
- NF was the only intervention that reduced the number of consequences

3) Motivation moderated the effectiveness of the interventions:

- PNF is appropriate for **MOTIVATED** students while the NF and CF are appropriate for **LOW MOTIVATED** students

4) This study does not support PNF as a universal strategy on alcohol use among college students

Support and Acknowledgements