

Translational research of a diabetes prevention intervention in China

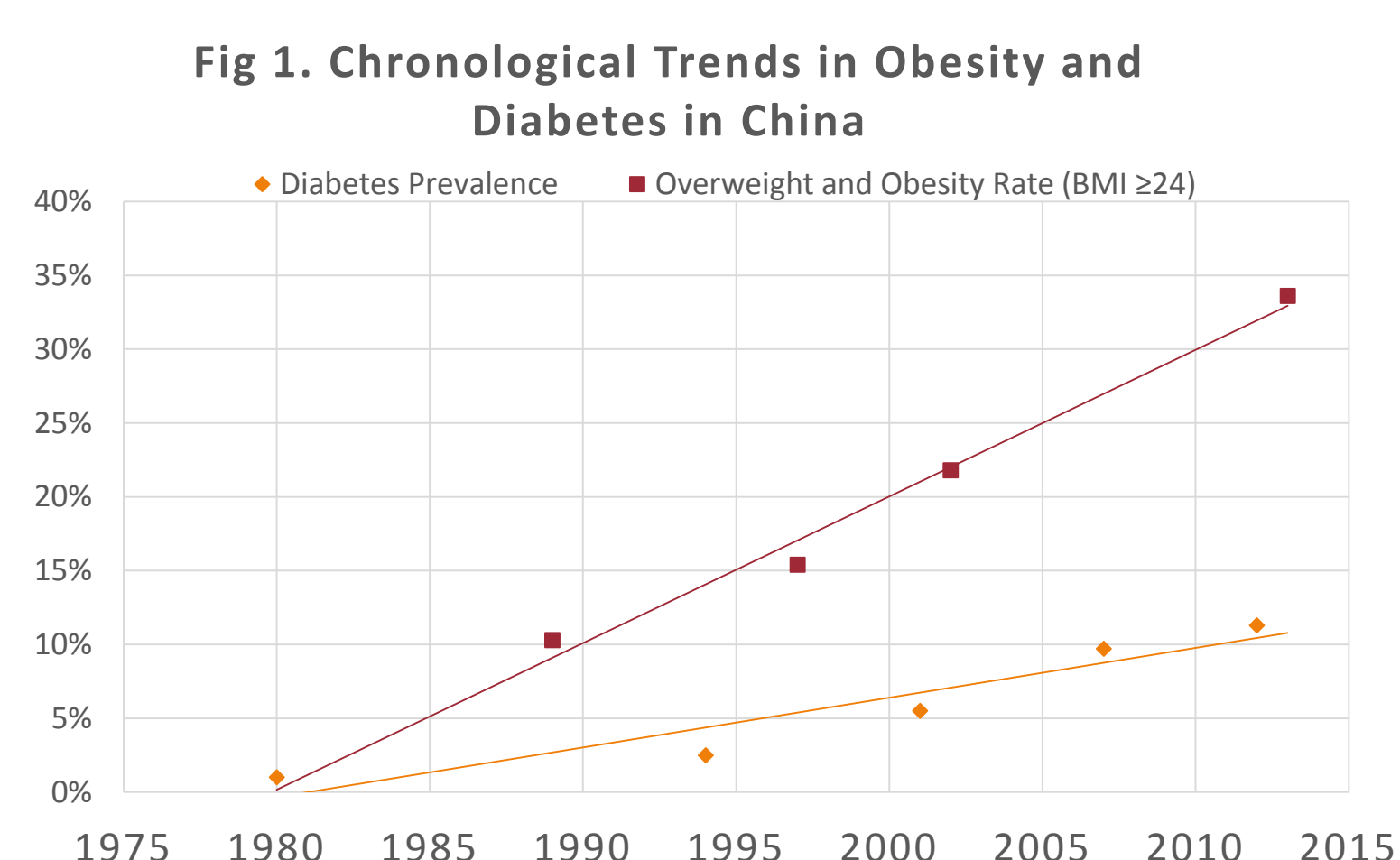
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China's Diabetes Epidemic

- Overweight and obesity in China are rising steadily (Fig 1, Yang et al, 2007), and prevalence of diabetes rose to 11.3% in 2012 (Fig 1, Wang et al, 2010, Xu et al, 2013). It is projected that medical expenditures associated with obesity-related type 2 diabetes care in China will reach \$47 billion USD by 2030 (Yang et al, 2010). From both a humanistic and financial perspective, it is critical that diabetes prevention be a high priority in China.



Culturally Appropriate Diabetes Prevention for China

- The Diabetes Prevention Program (DPP) is an evidence-based lifestyle intervention program effective in a variety of cultural settings (Pan et al, 1997; Ackermann et al, 2008). *Pathway To Health* (PATH) was a translational study to test the feasibility of the DPP program among pre-diabetic Chinese women in 2014.
- The goals of the intervention were to reduce body weight of participants in the intervention by 5% (Hamman et al, 2006), and to reduce diabetes measures (HbA1c, glucose) by a significant amount. This was to be achieved by increasing physical activity to 150 min per week and reducing caloric intake by 1000-1400 cal per week.

Setting. Community health centers in Yuci, China.

Curriculum. Project staff designed a 24 week curriculum.

Participants. 184 pre-diabetic women were randomized after baseline assessment (Fig 1). The intervention group (n=109) had 23 sessions and the comparison group (n=75) had six sessions.

Evaluate the project.

Anthropomorphic and blood chemistry measures were taken at 0, 6 and 12 months (Table 1).

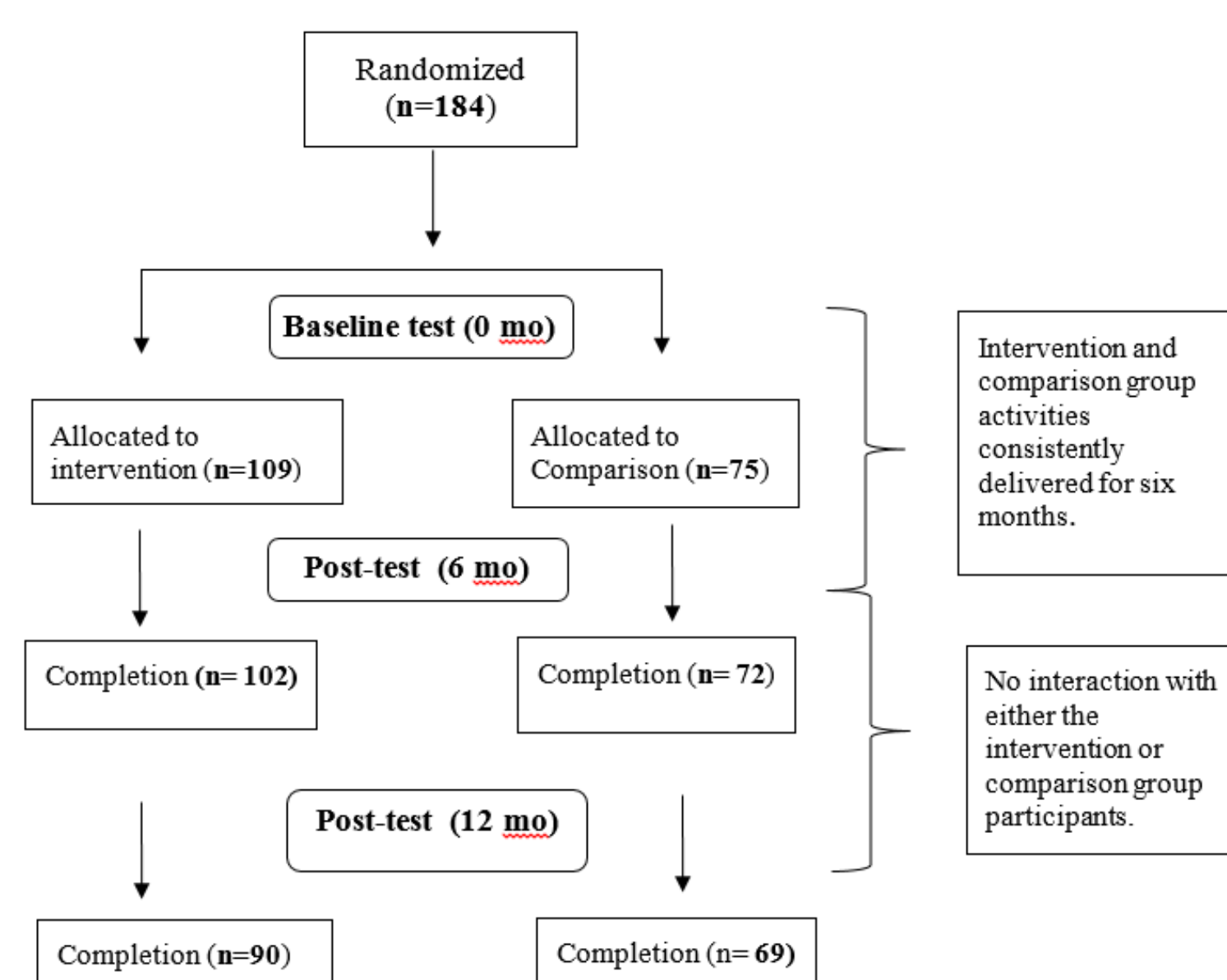
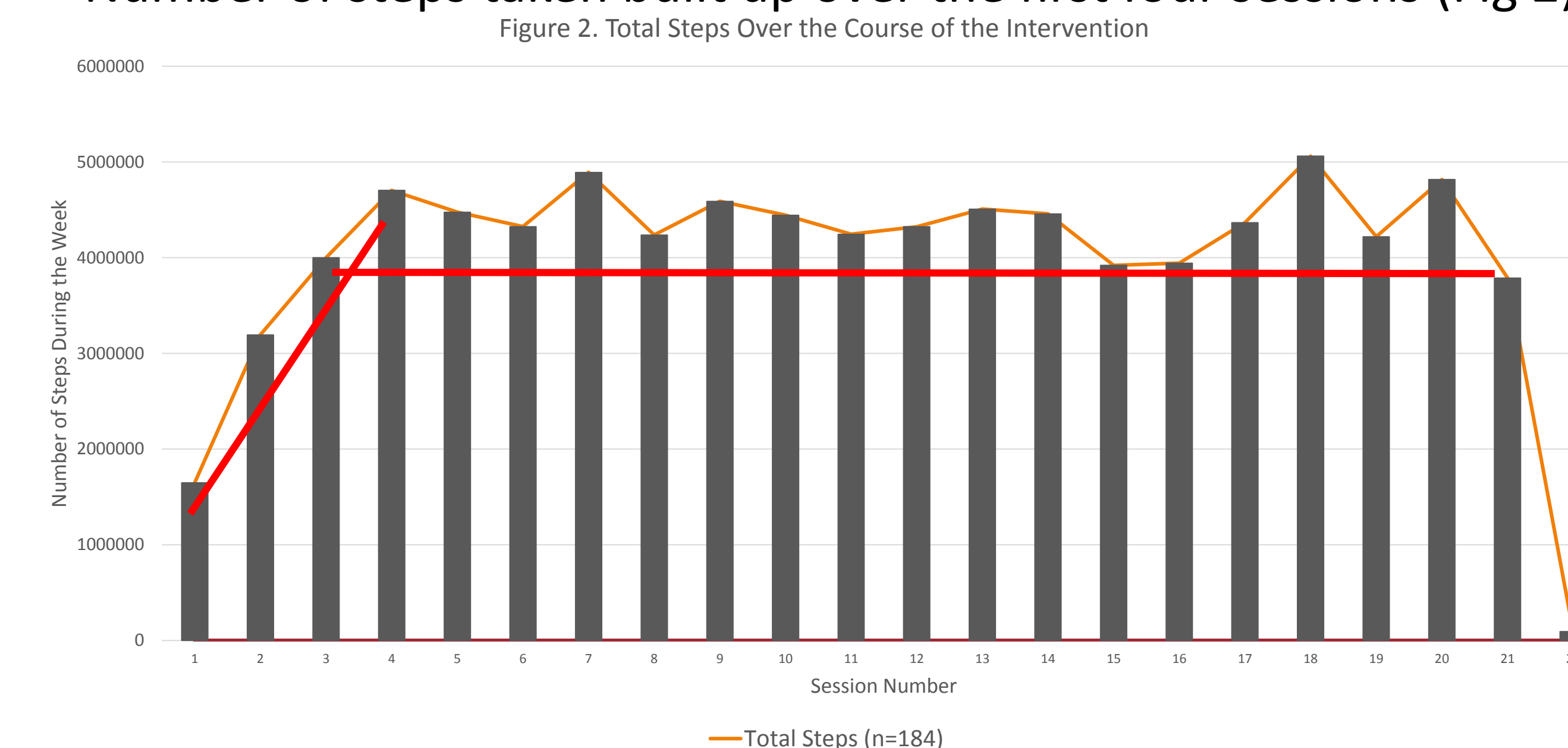


Figure 1. The design of the RCT in which the effectiveness of the PATH diabetes prevention program was evaluated.

Results

- Participant retention in the intervention and comparison groups was 83 and 92%. Attendance at all activities in the intervention and comparison groups was 68 and 58%.
- Number of steps taken built up over the first four sessions (Fig 2).

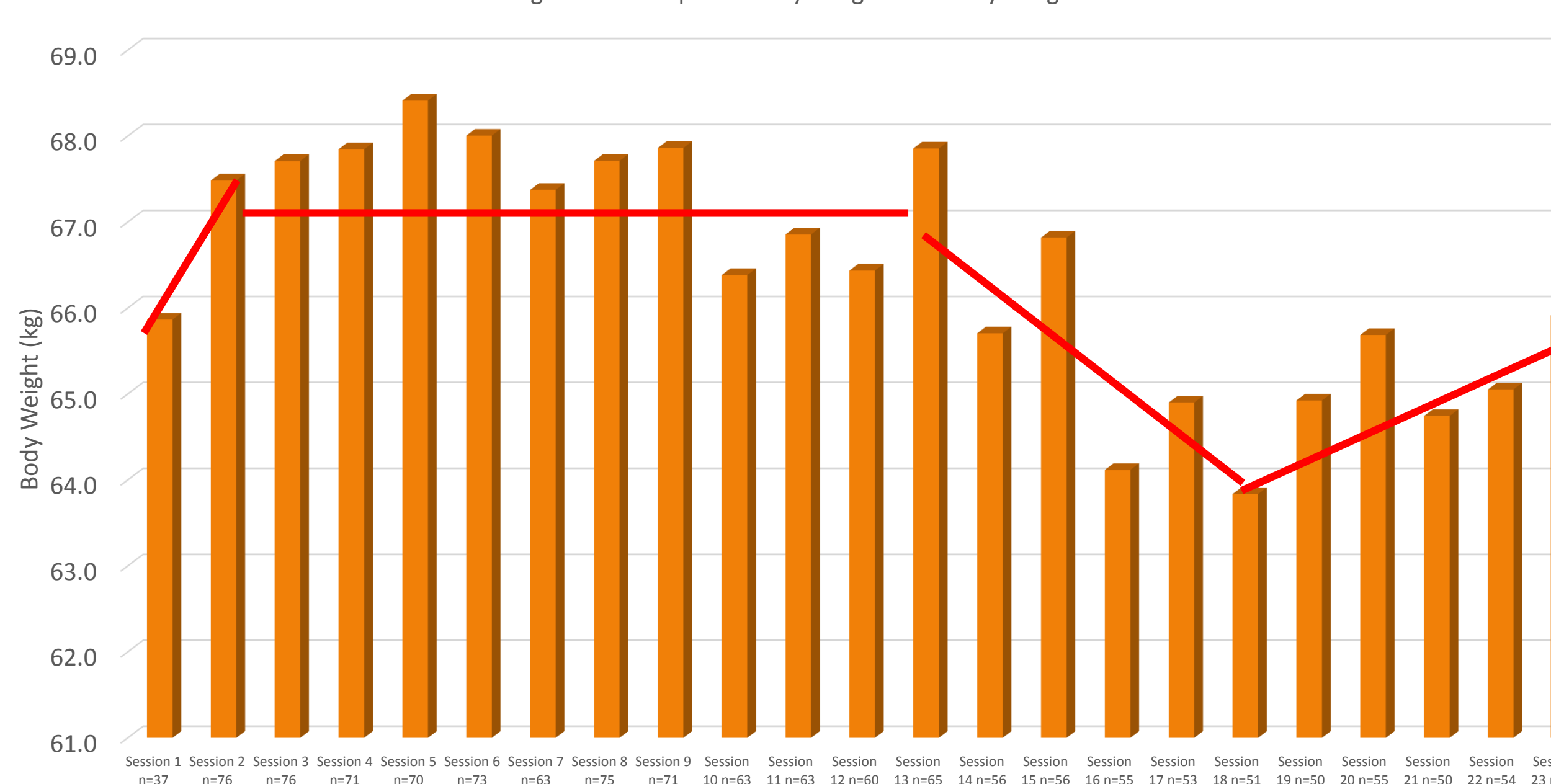


- Participants responded favorably to competition, such as the "Walk to Beijing" contest (Fig 3).
- Social support (Fig. 3), and competition, such as having a walking partner, were reported to be critical for maintaining their walking schedule during the winter months. Some participants viewed the pedometer as a "walking buddy."



Figure 3. Participants valued the support of small group activities (L). The "Walk to Beijing" competition was a significant motivator for the participants (R).

Figure 4. Participant's Body Weight at Weekly Weight-in



- The intervention and comparison groups lost 1.7 and 0.78 kg of weight at six months ($p < .05$) (Fig 4, Table 1). This represented 2.5 and 1.2% of body weight, respectively.
- HbA1c levels declined in both groups, although these changes did not reach statistical significance.

Table 1. Estimated Marginal Means and Standard Errors (SE) for Study Outcome Measures

Outcome measures	Comparison†			Intervention			Group difference at 6-mo‡	Group difference 12-mo‡
	Baseline	6-mo	12-mo	Baseline	6-mo	12-mo		
Weight (kg)	Mean	67.51 ^a	66.73 ^a	66.83 ^a	67.14 ^a	65.44 ^a	66.07 ^a	0.91*
	SE	1.13	1.18	1.17	0.88	0.92	0.92	0.45
BMI (kg/m ²)	Mean	27.19	26.90	26.94	27.20	26.52	26.80	0.39*
	SE	0.34	0.36	0.37	0.28	0.30	0.31	0.18
HbA1c (%)	Mean	5.96	5.76	5.6	6.02	5.8	5.71	0.01
	SE	0.06	0.06	0.06	0.05	0.05	0.05	0.08
Fasting glucose (mmol/l)	Mean	5.26	5.44	5.62	5.34	5.55	5.63	-0.04
	SE	0.07	0.07	0.07	0.06	0.05	0.05	0.08

†One way post hoc test for comparison of difference between baseline and month 6 and baseline and month 12. †denotes group difference (all $p < .05$ with Bonferroni adjustment for multiple comparisons). ‡ planned contrast for group difference at 6-mo posttest and 12-mo follow-up. * $p < .05$

Challenges in Translational Research

- Recruitment:** Although it introduces potential bias, some participants joined the study based upon the satisfying experience of their friends.
- Contamination:** It is difficult to prevent interaction between the arms of the study. In the PATH study, the control group had significant improvements. It appears that knowing the study they were participating in resulted in substantial behavioral change.
- Methods vs Values:** Cross-cultural translational research requires translating the methods of an evidence-based program, the language used to describe it, and the concepts underlying it (Palmer et al, 2011). Although concern about cultural appropriateness has been addressed, little has been done to truly create methods that come from the cultural values found in a given community (Mau et al, 2010).
- Cultural Values:** Chinese cultural values such as competitiveness, strong desire to improve one's own health, social support, and a desire to please contributed to the positive outcomes, but these values also worked in the comparison group.
- Capacity:** The research and project intervention capacity of many countries is insufficient to implement high quality translational research studies. Previous training among project staff in adult learning theory and participatory teaching methods was critical to the successful delivery of PATH.

Conclusion

- Effective translation of evidence-based methods for the prevention of diabetes is an urgent need globally (de Quevedo et al, 2012). The PATH study has effectively implemented the DPP in China. It has also revealed cultural assets in China that are effective in behavior change and project success.

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