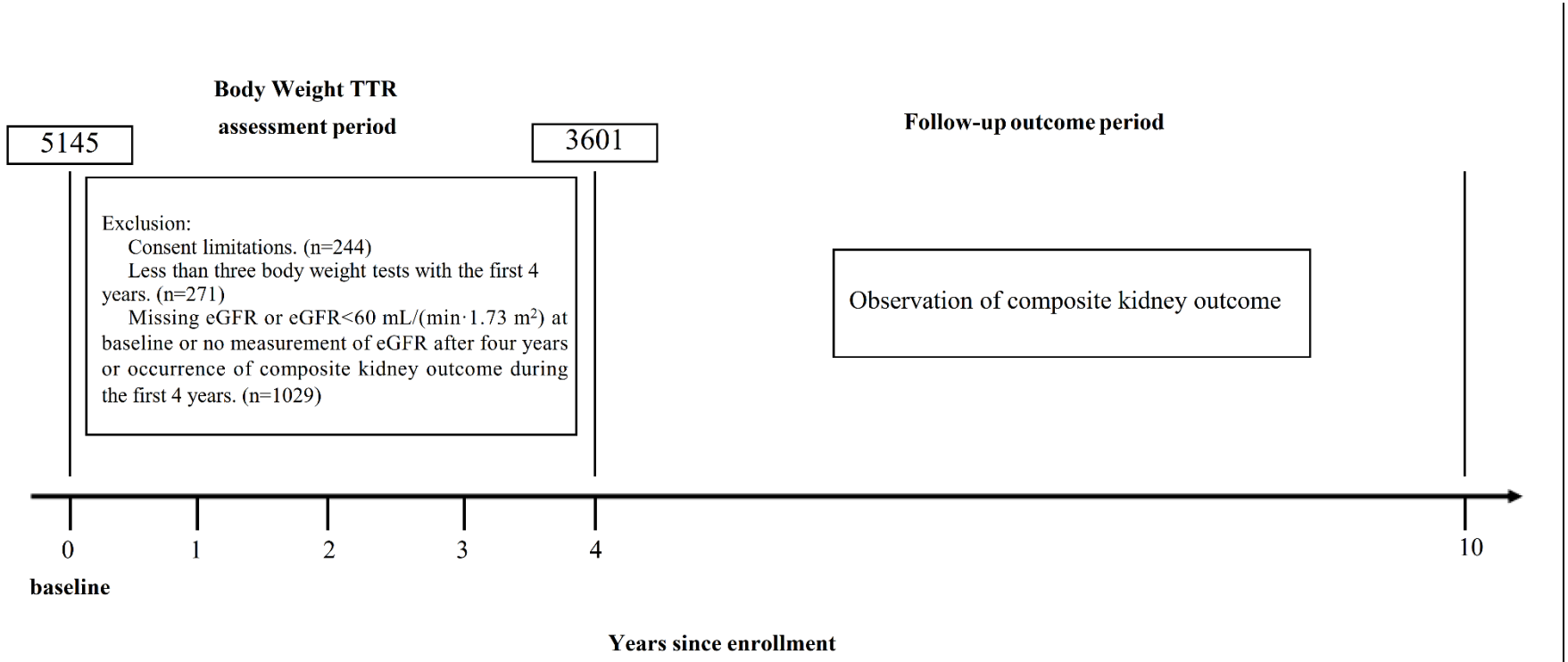
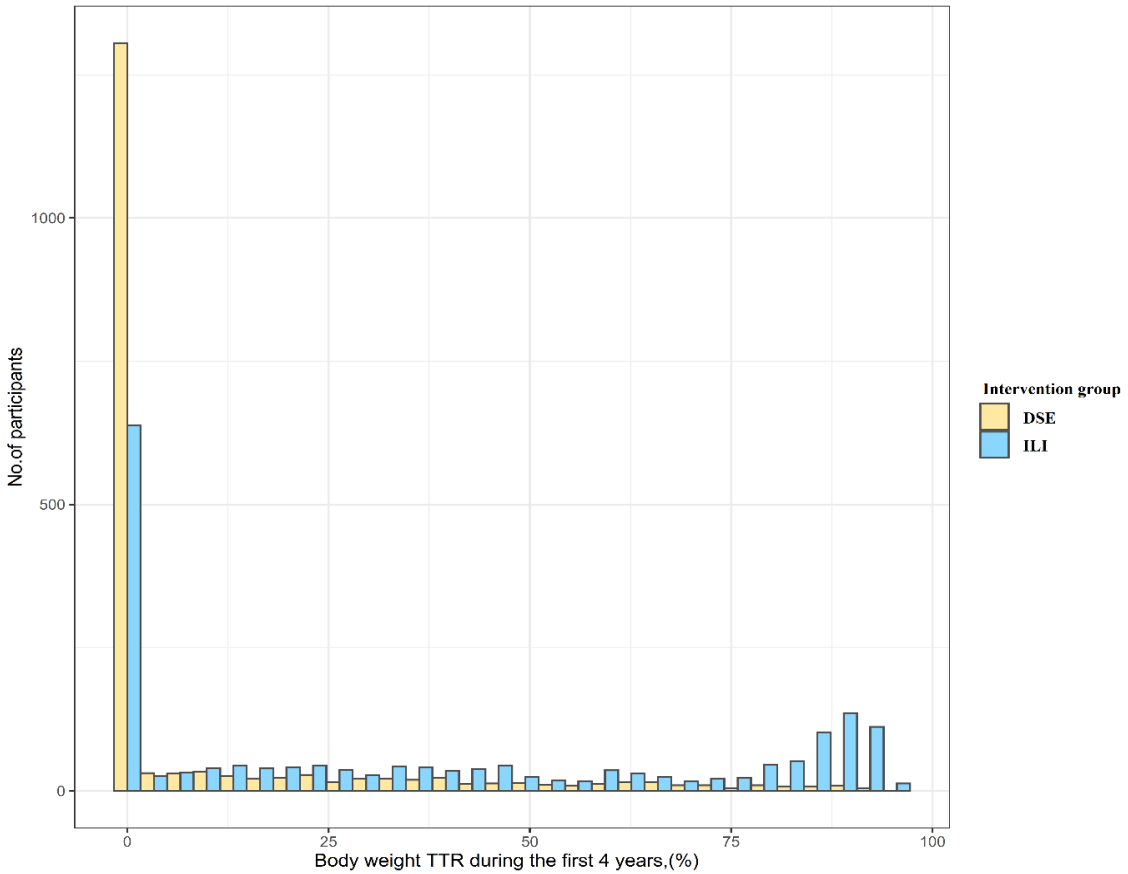
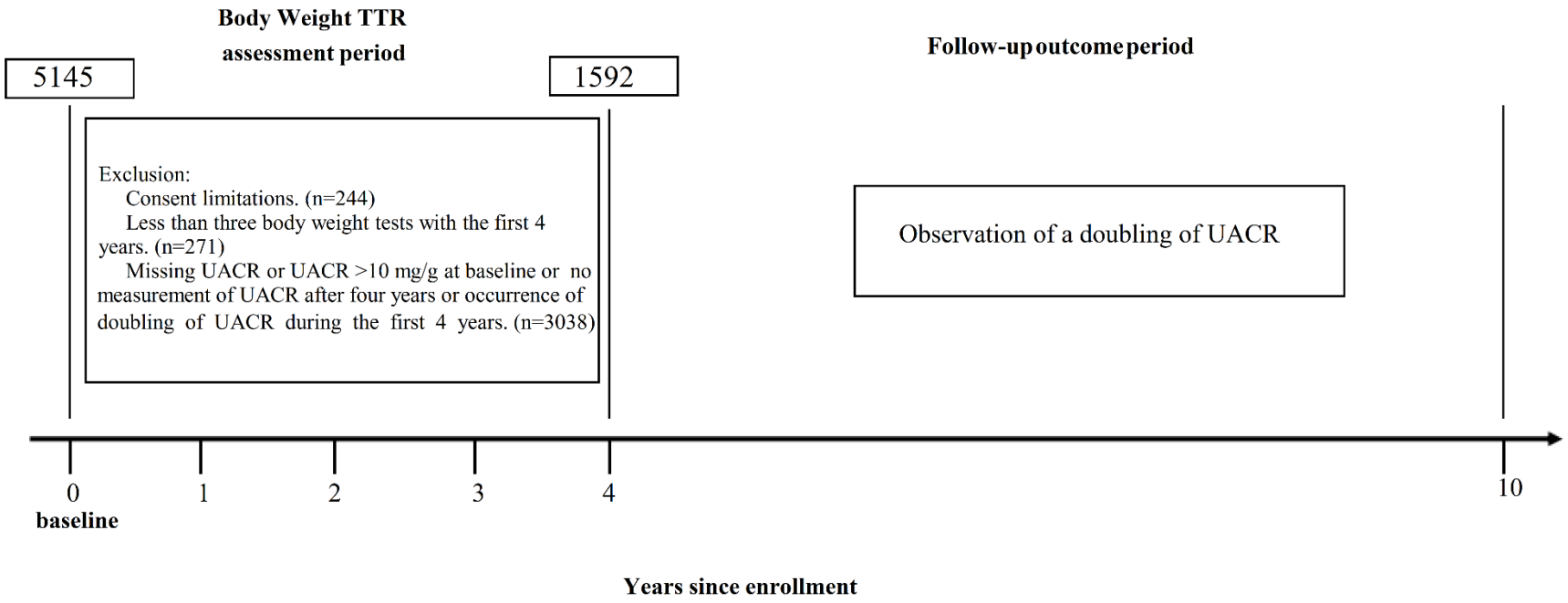


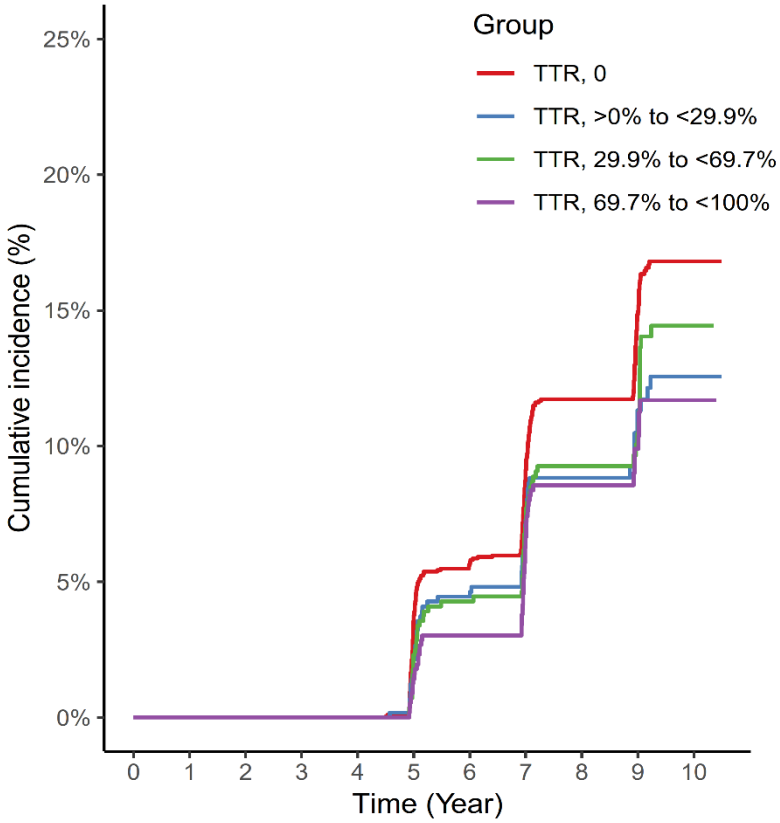
Supplemental Figure S1. Flow chart of the participants in the composite kidney outcome analysis



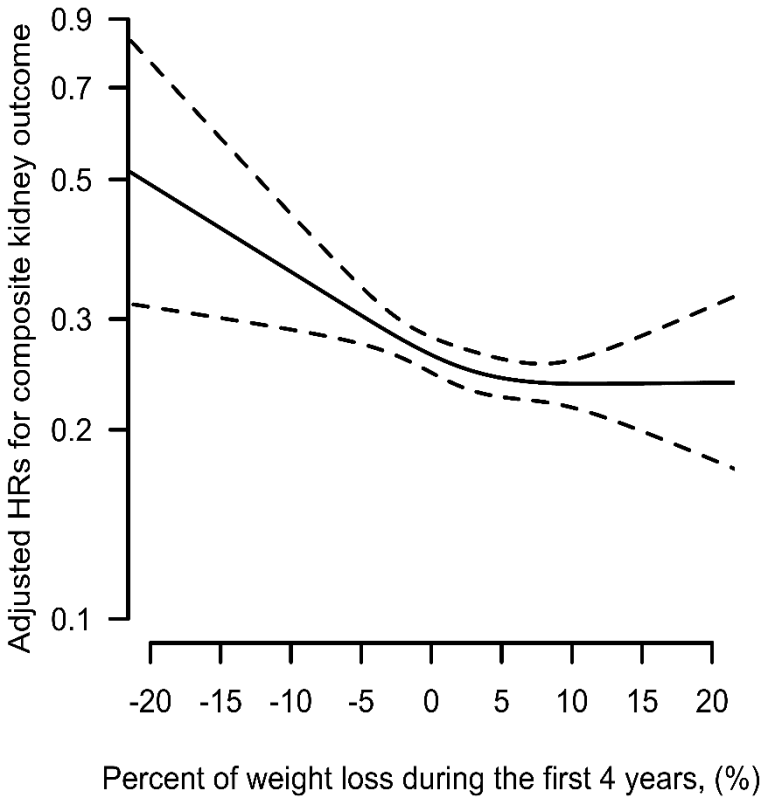
Supplemental Figure S2. Distribution of body weight time in target range during years 0-4 according to intervention group



Supplemental Figure S3. Flow chart of the participants in the doubling of urinary albumin to creatinine ratio outcomes analysis



Supplemental Figure S4. The Cumulative rate of composite kidney outcome according to the categories of body weight TTR (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years (0%, >0% to <29.9%, 29.9% to <69.7%, and 69.7% to <100%) using the Kaplan-Meier method



Supplemental Figure S5. Relationship between percent of weight loss in the first 4 year and composite kidney outcome. *

*Adjusted for age, sex, race, intervention group, education level, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline as well as body weight at baseline.

The percentage of body weight loss was calculated as the baseline weight value minus weight at 4 years divided by baseline weight and multiplied by 100.

Abbreviations: eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S1. Baseline characteristics of the participants included in and excluded from the analysis

Characteristics	Included participants (n = 3,601)	Excluded participants (n = 1,300)
Age, years	59.0 ± 6.6	61.2 ± 6.8
Female, No. (%)	2140 (59.4)	731 (56.2)
Race, No. (%)		
White	2355 (65.4)	892 (68.6)
African American / Black (not Hispanic)	628 (17.4)	176 (13.5)
Hispanic	485 (13.5)	191 (14.7)
Other/Mixed	133 (3.7)	41 (3.2)
ILI arm, No. (%)	1837 (51.0)	611 (47.0)
Body weight, kg	100.7 ± 19.2	102.0 ± 19.2
Mean body weight during the first 4 years, kg	97.7 ± 18.9	99.3 ± 18.8
Body mass index, kg/m^2	35.9 ± 5.9	36.2 ± 5.8
Systolic blood pressure, mm Hg	128.7 ± 16.8	130.4 ± 18.0
Diastolic blood pressure, mm Hg	70.4 (9.5)	69.8 (9.8)
Drinking status, No. (%)		
Yes	2272 (63.1)	759 (58.4)
No	1327 (36.9)	540 (41.6)
Smoking status, No. (%)		
Never	1807 (50.3)	619 (47.8)
Past	1639 (45.6)	617 (47.6)
Present	148 (4.1)	60 (4.6)
Education level, No. (%)		
< 13 years	681 (19.3)	245 (19.3)
> 16 years	1527 (43.2)	546 (43.1)
13 - 16 years	1323 (37.5)	476 (37.6)
History of cardiovascular disease, No. (%)	438 (12.2)	250 (19.2)
History of hypertension, No. (%)	2926 (81.3)	1171 (90.1)
Total cholesterol, mg/mL	191.3 ± 36.8	191.2 ± 39.2
Low-density lipoprotein cholesterol, mg/mL	113.1 ± 31.8	111.3 ± 33.5
HbA1c, %	7.2 ± 1.1	7.3 ± 1.2
Fasting glucose, mg/mL	153.0 ± 44.4	153.5 ± 48.5
eGFR, mL/ (min·1.73 m^2)	92.4 ± 13.9	82.4 ± 19.0
UACR, mg/g	8.0 (5.0, 16.0)	10 (6.0, 26.5)
Diabetes duration, years	6.3 ± 6.1	7.8 ± 7.2
Insulin use, No. (%)	492 (14.0)	256 (19.9)
Antihypertensive drugs, No. (%)	2481 (70.7)	1049 (81.6)

Variables are presented as mean ± standard deviation (SD) or No. (%) or Median (25,

75^{th} quantile);

Abbreviations: ILI: intensive lifestyle intervention; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S2. Association of mean body weight, variability of body weight during the first 4 years, and percentage of body weight loss from baseline to year 4 with composite kidney outcome

	N	Cases (Incidence rate [1])	Crude Model HR (95% CI)	*P* value	Adjusted Model HR (95% CI)	*P* value
Mean body weight (kg)[2]						
Quartiles						
53.3-<84.1	900	100 (13.1)	*ref*		*ref*	
84.1-<95.6	900	98 (12.9)	0.98 (0.74, 1.29)	0.884	0.93 (0.69, 1.25)	0.618
95.6-<108.7	900	119 (15.7)	1.21 (0.93, 1.57)	0.166	1.12 (0.83, 1.51)	0.464
108.7-178.3	901	118 (15.5)	1.18 (0.91, 1.54)	0.219	1.35 (0.98, 1.85)	0.065
Body weight variability [standard deviation (SD)] [3]						
Quartiles						
<2.3	900	106 (13.8)	*ref*		*ref*	
2.3-<3.6	900	118 (15.5)	1.13 (0.87, 1.47)	0.371	1.08 (0.82, 1.43)	0.587
3.6-<5.4	901	106 (14.0)	1.02 (0.78, 1.34)	0.882	1.02 (0.76, 1.37)	0.881
≥5.4	900	105 (13.8)	1.00 (0.77, 1.32)	0.974	1.04 (0.77, 1.41)	0.812
Percent of body weight loss (%)[4]						
Quartiles						
< -1.7	892	117 (15.6)	*ref*		*ref*	
-1.7 -<2.4	891	114 (15.1)	0.97 (0.75, 1.25)	0.788	0.95 (0.73, 1.24)	0.705
2.4 -<7.2	892	108 (14.4)	0.92 (0.71, 1.20)	0.547	0.86 (0.65, 1.14)	0.300
≥7.2	892	90 (11.9)	0.76 (0.58, 1.01)	0.055	0.68 (0.51, 0.92)	0.013

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density

lipoprotein cholesterol, fasting plasma glucose, history of cardiovascular disease, insulin use, antihypertensive drug use and diabetes duration at baseline, as well as body weight variability during the first 4 years;

[3]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, history of cardiovascular disease, insulin use, antihypertensive drug use and diabetes duration at baseline, as well as mean body weight during the first 4 years;

[4]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, history of cardiovascular disease, insulin use, antihypertensive drug use and diabetes duration at baseline, as well as body weight at baseline;

Abbreviations: eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S3. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with composite kidney outcome with further adjustment for the percentage of body weight loss from baseline to year 4

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
Categories[3]						
0%	1915	262 (16.2)	*ref*		*ref*	
>0% to <29.9%	562	57 (12.0)	0.74 (0.55, 0.98)	0.038	0.73 (0.53, 1.01)	0.061
29.9% to <69.7%	562	63 (13.2)	0.81 (0.62, 1.07)	0.135	0.71 (0.50, 1.01)	0.057
69.7% to <100%	562	53 (11.2)	0.69 (0.51, 0.93)	0.013	0.54 (0.35, 0.84)	0.006

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, history of cardiovascular disease, insulin use, antihypertensive drug use and diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years, and the percentage of body weight loss from baseline to year 4.

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S4. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with composite kidney outcome in the ILI and DSE group, respectively.

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
ILI (intensive lifestyle intervention)						
Categories[3]						
0%	624	95 (18.0)	*ref*		*ref*	
>0% to <36.2%	405	38 (11.0)	0.60 (0.41, 0.88)	0.009	0.57 (0.38, 0.85)	0.006
36.2% to <81.6%	404	45 (13.2)	0.73 (0.51, 1.04)	0.085	0.63 (0.41, 0.96)	0.031
81.6% to <100%	404	34 (9.9)	0.54 (0.37, 0.80)	0.002	0.42 (0.25, 0.72)	0.001
DSE (diabetes support and education)						
Categories[3]						
0%	1291	167 (15.3)	*ref*		*ref*	
>0% to <18.3%	158	18 (13.5)	0.88 (0.54, 1.43)	0.613	0.94 (0.57, 1.55)	0.797
18.3% to <43.3%	157	15 (11.2)	0.73 (0.43, 1.24)	0.245	0.70 (0.39, 1.25)	0.229
43.3% to <100%	158	23 (17.5)	1.17 (0.75, 1.80)	0.492	1.08 (0.63, 1.85)	0.775

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S5. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with doubling of urinary albumin to creatinine ratio outcomes in the ILI and DSE group, respectively.

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
ILI (intensive lifestyle intervention)						
Categories[3]						
0%	248	68 (33.6)	*ref*		*ref*	
>0% to <35.4%	194	56 (36.1)	1.10 (0.77, 1.57)	0.588	1.00 (0.67, 1.49)	1.000
35.4% to <82.8%	194	52 (33.8)	1.05 (0.73, 1.50)	0.805	0.96 (0.62, 1.48)	0.864
82.8% to <100%	195	32 (19.9)	0.59 (0.39, 0.90)	0.013	0.41 (0.23, 0.75)	0.003
DSE (diabetes support and education)						
Categories[3]						
0%	552	166 (38.0)	*ref*		*ref*	
>0% to <17.9%	70	20 (36.8)	0.98 (0.62, 1.57)	0.947	1.12 (0.69, 1.83)	0.649
17.9% to <41.0%	69	11 (18.9)	0.47 (0.26, 0.87)	0.016	0.49 (0.25, 0.95)	0.035
41.0% to <100%	70	17 (29.4)	0.74 (0.45, 1.23)	0.246	0.67 (0.35, 1.30)	0.238

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S6. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with doubling of UACR, which was defined as a doubling of UACR from a value of <30 mg/g to a value of ≥30 mg/g, in the ILI and DSE group, respectively.

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
ILI (intensive lifestyle intervention)						
Categories[3]						
0%	508	81 (18.9)	*ref*		*ref*	
>0% to <35.8%	364	52 (17.0)	0.90 (0.63, 1.27)	0.548	0.76 (0.52, 1.11)	0.154
35.8% to <81.8%	364	51 (17.0)	0.92 (0.65, 1.31)	0.645	0.75 (0.49, 1.12)	0.162
81.8% to <100%	364	39 (12.7)	0.68 (0.46, 0.99)	0.044	0.59 (0.35, 0.99)	0.045
DSE (diabetes support and education)						
Categories[3]						
0%	1078	163 (18.0)	*ref*		*ref*	
>0% to <19.7%	135	17 (15.0)	0.83 (0.51, 1.38)	0.478	1.01 (0.60, 1.70)	0.968
19.7% to <44.9%	135	19 (16.6)	0.91 (0.57, 1.47)	0.702	1.17 (0.69, 2.00)	0.552
44.9% to <100%	136	18 (15.8)	0.88 (0.54, 1.43)	0.601	1.08 (0.59, 1.97)	0.811

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group (in the total population model) education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S7. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with incident very-high risk chronic kidney diseases in ILI and DSE group, respectively.

TTR	N	Cases	Crude Model		Adjusted Model[2]	
		(Incidence rate[1])	HR (95% CI)	*P* value	HR (95% CI)	*P* value
ILI (intensive lifestyle intervention)						
Categories[3]						
0%	668	24 (4.1)	*ref*		*ref*	
>0% to <35.8%	443	13 (3.4)	0.83 (0.42, 1.63)	0.594	0.79 (0.38, 1.66)	0.536
35.8% to <80.8%	442	19 (5.0)	1.24 (0.68, 2.27)	0.480	0.98 (0.47, 2.05)	0.967
80.8% to <100%	443	8 (2.1)	0.51 (0.23, 1.14)	0.100	0.41 (0.15, 1.13)	0.084
DSE (diabetes support and education)						
Categories[3]						
0%	1389	51 (4.2)	*ref*		*ref*	
>0% to <19.0%	175	6 (4.0)	0.94 (0.40, 2.19)	0.886	1.00 (0.38, 2.59)	0.994
19.0% to <43.6%	175	8 (5.3)	1.26 (0.60, 2.65)	0.545	1.44 (0.61, 3.40)	0.408
43.6% to <100%	175	8 (5.4)	1.30 (0.62, 2.75)	0.486	1.30 (0.51, 3.31)	0.576

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group (in the total population model), education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S8. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) during the first 4 years with composite kidney outcome, with further adjustments for mean SBP, mean UACR, mean LDL-C, mean FPG and mean eGFR during the first 4 years

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
Categories[3]						
0%	1915	262 (16.2)	*ref*		*ref*	
>0% to <29.9%	562	57 (12.0)	0.74 (0.55,0.98)	0.038	0.77 (0.56, 1.06)	0.111
29.9% to <69.7%	562	63 (13.2)	0.81 (0.62,1.07)	0.135	0.81 (0.59, 1.12)	0.207
69.7% to <100%	562	53 (11.2)	0.69 (0.51,0.93)	0.013	0.64 (0.43, 0.94)	0.025

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, **mean SBP, mean UACR, mean LDL-C, mean FPG, mean eGFR,** insulin use, history of cardiovascular disease, antihypertensive drug use, and diabetes duration at baseline, as well as, mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; SBP, systolic blood pressure; UACR, urinary lbumin to creatinine ratio; LDL-C, low-density lipoprotein cholesterol; FPG, fasting plasma glucose; eGFR, estimated glomerular filtration rate.

Supplemental Table S9. Association of body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 5% of initial weight) during the first 4 years with composite kidney outcome

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
Categories[3]						
0%	1482	192 (15.3)	*Ref*		*Ref*	
>0% to <35.3%	706	98 (16.5)	1.09 (0.85, 1.39)	0.506	1.09 (0.84, 1.43)	0.517
35.3% to <79.5%	706	77 (12.8)	0.83 (0.64, 1.08)	0.160	0.80 (0.58, 1.09)	0.161
79.5% to <100%	707	68 (11.4)	0.75 (0.57, 0.98)	0.038	0.62 (0.43, 0.90)	0.012

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years.

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S10. Association between body weight time in target range (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) and composite kidney outcome that was reconfirmed at subsequent follow-up

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
Categories[3]						
0%	1946	228 (13.7)	*Ref*		*Ref*	
>0% to <29.7%	572	46 (9.4)	0.69 (0.50, 0.94)	0.020	0.68 (0.48, 0.96)	0.028
29.7% to <69.8%	571	55 (11.2)	0.80 (0.59, 1.07)	0.129	0.70 (0.49, 0.99)	0.043
69.8% to <100%	572	45 (9.2)	0.69 (0.50, 0.95)	0.023	0.54 (0.35, 0.83)	0.005

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, and diabetes duration at baseline, as well as mean body weight and body weight variability during the first 4 years;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.

Supplemental Table S11. Association of body weight time in target range based on all measures of weight before outcome occurrent or end of follow-up (the proportion of time that participants maintained a weight loss target of losing at least 7% of initial weight) with composite kidney outcome

TTR	N	Cases (Incidence rate[1])	Crude Model		Adjusted Model[2]	
			HR (95% CI)	*P* value	HR (95% CI)	*P* value
Categories[3]						
0%	1870	270 (17.4)	*Ref*		*Ref*	
>0% to <29.1%	577	58 (11.6)	0.64 (0.49, 0.86)	0.002	0.67 (0.50, 0.91)	0.011
29.1% to <63.9%	577	50 (10.0)	0.55 (0.41, 0.74)	<0.001	0.52 (0.37, 0.72)	<0.001
63.9% to <100%	577	57 (11.5)	0.64 (0.48, 0.85)	0.002	0.49 (0.34, 0.71)	<0.001

[1]Incidence rates per 1000 person years.

[2]Adjusted for age, sex, race, intervention group, education levels, smoking and drinking status, systolic blood pressure, eGFR, UACR, low-density lipoprotein cholesterol, fasting plasma glucose, insulin use, history of cardiovascular disease, antihypertensive drug use, and diabetes duration at baseline, as well as mean body weight and body weight variability based on all measures of weight before outcome occurrent or end of follow-up;

[3]Participants with TTR of 0% were used as the reference category, and the remaining participants were divided by tertiles of body weight TTR during the first 4 years.

Abbreviations: TTR, time in target range; eGFR, estimated glomerular filtration rate; UACR, urinary albumin to creatinine ratio.