

Table S1. Demographic characteristics of study participants and their Knowledge, Attitude, and Practice scores

Variables	N (%)	Knowledge score		Attitudes score		Practice score	
		Mean ± SD	P*	Mean ± SD	P	Mean ± SD	P
Total	522	16.24 ± 3.88		33.31 ± 3.32		28.69 ± 2.74	
Age, years			0.385		0.799		0.004
18-45	125 (23.95)	15.90 ± 3.73		33.48 ± 3.76		28.29 ± 3.58	
46-60	225 (43.10)	16.20 ± 4.13		33.24 ± 3.32		28.48 ± 2.78	
> 60	172 (32.95)	16.53 ± 3.65		33.28 ± 2.98		29.25 ± 1.76	
Gender			0.753		0.596		0.276
Male	290 (55.56)	16.19 ± 3.80		33.24 ± 3.12		28.81 ± 2.59	
Female	232 (44.44)	16.30 ± 3.99		33.40 ± 3.57		28.54 ± 2.92	
Marital status			0.112		0.828		0.090
Married	434 (83.14)	16.38 ± 3.90		33.35 ± 3.31		28.76 ± 2.64	
Unmarried	49 (9.39)	15.92 ± 3.36		33.14 ± 3.08		27.88 ± 3.69	
Divorced/Widowed	39 (7.47)	15.08 ± 4.13		33.08 ± 3.75		28.90 ± 2.36	
Residence			0.615		0.843		0.014
Urban	381 (72.99)	16.26 ± 3.86		33.30 ± 3.24		28.90 ± 2.60	
Rural	110 (21.07)	16.34 ± 4.00		33.26 ± 3.64		28.05 ± 3.13	

Suburban	31 (5.94)	15.58 3.82	±	33.65 ± 3.22	28.39 ± 2.69	
Education				0.766	0.268	0.267
Primary school and below	109 (20.88)	15.97 4.25	±	33.28 ± 3.42	28.72 ± 2.65	
Middle school		16.22	±			
	161 (30.84)	3.83		33.35 ± 3.46	28.52 ± 3.12	
High school/Technical secondary school		16.36	±			
	134 (25.67)	3.85		32.90 ± 3.28	28.94 ± 2.54	
Junior college/Undergraduate		16.44	±			
	113 (21.65)	3.65		33.81 ± 2.94	28.71 ± 2.37	
Postgraduate and above		14.60	±			
	5 (0.96)	4.34		32.20 ± 5.26	26.40 ± 4.39	
Work status				0.336	0.836	0.002
Unemployed/Layoff	147 (28.16)	16.46 3.73	±	33.54 ± 3.23	28.61 ± 2.58	
Employed		16.38	±			
	60 (11.49)	3.66		33.43 ± 3.40	28.12 ± 3.28	
Retired		16.27	±			
	242 (46.36)	3.82		33.20 ± 3.13	29.01 ± 2.17	
Self-employed/Freelance		16.00	±			
	48 (9.20)	4.41		33.02 ± 3.56	28.94 ± 2.34	
Full-time househusband/housewife		14.72	±			
	25 (4.79)	4.70		33.28 ± 4.88	26.96 ± 5.81	
Monthly per capita income, CNY				0.300	0.814	0.996
<2000		15.92	±			
	182 (34.87)	4.03		33.30 ± 3.55	28.73 ± 2.87	
2000-4999		16.47	±			
	219 (41.95)	3.78		33.21 ± 3.06	28.67 ± 2.68	

5000-9999		16.57	±			
	89 (17.05)	3.79		33.42 ± 3.54	28.66 ± 2.72	
≥10000		15.53	±			
	32 (6.13)	3.98		33.78 ± 3.13	28.69 ± 2.71	
Medical insurance type				<0.001	<0.001	<0.001
			1			
Social medical insurance only	491 (94.06)	16.35	±			
		3.69		33.43 ± 3.16	28.75 ± 2.52	
Commercial medical insurance only		17.50	±			
	2 (0.38)	0.71		36.00 ± 0.00	24.00 ± 8.49	
Both social and commercial medical insurance	22 (4.21)	16.18	±	31.73 ± 3.33	29.50 ± 1.57	
		3.96				
No medical insurance	7 (1.34)	8.14 ± 7.97		28.86 ± 8.40	23.57 ± 8.66	
Duration of the HD, years				<0.001	0.344	0.014
			1			
< 1		15.10	±			
	109 (20.88)	4.57		33.16 ± 3.59	28.16 ± 2.85	
[1, 2)		15.77	±			
	70 (13.41)	4.15		33.03 ± 3.71	28.17 ± 4.08	
[2, 3)		15.81	±			
	54 (10.34)	4.54		32.80 ± 3.64	28.74 ± 2.65	
≥3		16.86	±			
	289 (55.36)	3.25		33.53 ± 3.04	29.01 ± 2.25	
Participation in relevant education in fistulas care or management				<0.001	0.066	0.015
			1			
Yes		16.43	±			
	493 (94.44)	3.72		33.38 ± 3.28	28.76 ± 2.66	
No	29 (5.56)	12.97	±			
		5.04		32.20 ± 3.84	27.48 ± 3.75	

Guidance on fistula care received from				<0.001	0.014	0.002
Doctor	55 (10.54)	16.27 3.52	±	33.42 ± 3.29	29.51 ± 1.87	
Nurse	57 (10.92)	14.05 5.31	±	32.04 ± 4.80	27.82 ± 4.00	
Doctor and nurse	396 (75.86)	16.63 3.52	±	33.51 ± 3.00	28.75 ± 2.48	
Not received in hospital	14 (2.68)	13.79 4.71	±	32.57 ± 3.90	27.21 ± 4.77	
Arteriovenous fistulas currently used				0.028	0.197	0.348
The first one	425 (81.42)	16.06 3.86	±	33.40 ± 3.30	28.74 ± 2.66	
The second or more	97 (18.58)	17.02 3.92	±	32.92 ± 3.40	28.45 ± 3.08	
Lifespan of the current arteriovenous fistula, years				0.008	0.060	0.215
< 1	127 (24.33)	15.49 4.39	±	33.20 ± 3.50	28.39 ± 2.63	
[1, 2)	76 (14.56)	16.00 3.51	±	33.33 ± 2.75	28.68 ± 2.90	
[2, 3)	57 (10.92)	15.65 5.03	±	32.28 ± 3.46	28.30 ± 3.31	
≥3	262 (50.19)	16.80 3.33	±	33.58 ± 3.33	28.92 ± 2.61	
Other family members on HD				0.039	0.848	0.195
Yes	65 (12.45)	17.17 3.11	±	33.38 ± 3.25	28.28 ± 3.07	
No	457 (87.55)	16.11	±	33.30 ± 3.34	28.75 ± 2.69	

3.97
*Independent t-test was used for comparisons between two groups, and one-way ANOVA was used for comparisons between multiple groups

Questionnaire	
Knowledge, attitude, and practice toward arteriovenous fistulas among uremic patients on hemodialysis	
Demographic information	
1. Age, years	
2. Gender	a. Male b. Female
3. Marital status	a. Unmarried b. Married c. Divorced/Widowed
4. Residence	a. Rural b. Urban c. Suburban
5. Education	a. Primary school and below b. Middle school c. High school/Technical secondary school d. Junior college/Undergraduate e. Postgraduate and above
6. Work status	a. Employed b. Unemployed/Layoff c. Retired d. Self-employed/Freelance e. Full-time househusband/housewife
7. Monthly per capita income, CNY	a. <2000 b. 2000-4999 c. 5000-9999 d. ≥10000

8. Medical insurance type	a. Social medical insurance only b. Commercial medical insurance only c. Both social and commercial medical insurance d. No medical insurance
9. Duration of the HD, years	a. < 1 b. [1, 2) c. [2, 3) d. ≥3
10. Participation in relevant education in fistulas care or management	a. Yes b. No
11. Guidance on fistula care received from	a. Doctor b. Nurse c. Doctor and nurse d. Not received in hospital
12. Arteriovenous fistulas currently used	a. The first one b. The second or more
13. Lifespan of the current arteriovenous fistula, years	a. < 1 b. [1, 2) c. [2, 3) d. ≥3
14. Other family members on HD	a. Yes b. No

Knowledge

1. For the first hemodialysis, a central venous catheter should be chosen instead of fistulas.	a. Correct	b. Wrong	c. Unclear
2. A correct range of blood pressure and hemoglobin control in blood will help prolong the fistulas' lifespan.	a. Know well	b. Partially know	c. Don't know
3. If anticoagulation medication is not taken on time as prescribed by the doctor, it will affect the lifespan of the fistulas to some extent.	a. Know well	b. Partially know	c. Don't know
4. Excessive compression of the fistulas at the end of hemodialysis can reduce the lifespan of the fistulas to some extent.	a. Know well	b. Partially know	c. Don't know
5. The weight gain of more than 5% of dry weight during the hemodialysis interval will affect the fistulas' lifespan.	a. Know well	b. Partially know	c. Don't know
6. The arm on the side of the fistula should not be used for blood pressure measurement, intravenous infusion and blood collection, heavy lifting, or bearing pressure.	a. Know well	b. Partially know	c. Don't know
7. The vessels of the fistulas should not be used for anything other than hemodialysis and emergency rescue.	a. Know well	b. Partially know	c. Don't know
8. Daily inspection of the arteriovenous fistulas by the patient/families and at least one palpation or auscultation is an effective measure to detect the possible problems in fistulas promptly.	a. Know well	b. Partially know	c. Don't know
9. Keeping the skin on the side of the fistula intact and clean, especially by effectively washing the skin before puncture, helps to prevent local skin infections in the fistulas.	a. Know well	b. Partially know	c. Don't know
10. In case of a fear of or intolerance for punctures, you will inform the healthcare provider to choose another puncture option that suits you.	a. Know well	b. Partially know	c. Don't know
11. For the first hemodialysis, fistulas should be chosen instead of a central venous catheter.	a. Correct	b. Wrong	c. Unclear

Attitude

1. The lifespan of the arteriovenous fistulas is mainly	a. Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly
---	-------------	----------	------------	-------------	-------------

determined by the material used, and there is little influence by how it is cared for.	agree					disagree
2. For the care of arteriovenous fistulas, keeping your blood pressure within the range recommended for your age is important.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
3. It is important to use anticoagulants as prescribed by your doctor to keep the fistulas flowing.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
4. It is necessary to check your fistulas at least once every day.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
5. Is it important to wash the skin around the fistula before each puncture to prevent local infection at the site?	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
6. It is the patient's responsibility to decide on the puncture site with the nurse for each puncture.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
7. As long as it is a one-time success and has no effect on the lifespan of the fistulas, there is no matter how many years of work experience the nurses have, and there is no need to insist on a nurse with many years of work experience to perform the puncture.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
8. As long as the place is right, the different ways of puncture (rope ladder cannulation, buttonhole cannulation, area cannulation) have no direct impact on the lifespan of the fistulas.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
9. The level of pain experienced by the patient during a puncture is one of the most important criteria for evaluating the puncture skills of nurses.	a. agree	Strongly	b. Agree	c. Neutral	d. Disagree	e. Strongly disagree
Practice						

1. You will contact and inform your healthcare provider if there is redness, warmth, pain, swelling or purulent discharge on the skin around the fistula.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient
2. You will contact and inform your healthcare provider if there are any abnormalities during hemodialysis, such as weakness or loss of pulsation in the blood vessels near your fistula.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient
3. You would not use the arm on the fistula's side to draw blood or intravenous infusions.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient
4. You would not use the arm on the fistula's side to lift heavy objects.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient
5. You would not use the arm on the fistula's side to be under pressure; for example, do not use it to measure blood pressure and sleep on it.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient
6. After hemodialysis, if you find bleeding at the puncture site of your fistulas on your way home or at home, you can handle it without fear or panic.	a. Completely obedient	b. Relatively obedient	c. Moderately	d. Relatively not obedient	e. Never obedient