

Supplemental Table S1. Characteristics and health status of study participants (n = 437)

Variables	n	%
Age [years]		
< 30	110	25.2
31–40	185	42.3
41–50	105	24.0
≥ 51	37	8.5
Education level		
High school or lower	144	33.0
Junior college	108	24.7
College	139	31.8
Graduate school	46	10.5
Marital status		
Married	313	71.6
Cohabitation	29	6.6
Divorced	32	7.3
Widowed	2	0.5
Separated	9	2.1
Single	52	11.9
Monthly individual income [RMB]		
< 2,499	81	18.5
2,500–4,999	98	22.4
5,000–9,999	138	31.6
≥ 10,000	120	27.5
Occupation		
Farmers	13	3.0
Workers	42	9.6
Government	99	22.7
Private	95	21.7
Self-employed	51	11.7
Teachers	30	6.9
Students	9	2.1
Others	37	8.5
Retired	22	5.0
Unemployed	39	8.9
Region		
Shanghai	377	86.3
Jiangsu	36	8.2
Anhui	11	2.5
Beijing	2	0.5
Zhejiang	2	0.5
Henan	2	0.5
Tianjin	1	0.2
Chongqing	1	0.2
Guangdong	1	0.2
Hubei	1	0.2
Inner Mongolia	1	0.2
Shandong	1	0.2
Oversea	1	0.2
Self-evaluated health status		
Very poor	8	1.8
Relatively poor	58	13.3
Average	255	58.4
Relatively healthy	108	24.7

Very healthy	8	1.8
Screening for cervical cancer		
On a regular basis	253	57.9
Occasionally	138	31.6
Never	46	10.5
HPV subtypes		
HPV16 and/or HPV18	92	21.6
Other high-risk HPV subtypes	109	25.5
Low-risk HPV subtypes	25	5.9
Both high- and low- risk HPV subtypes	21	4.9
Uncertain/Don't know	111	26

Supplemental Table S2. HPV knowledge needs and information seeking (*n* = 437)

Variables	N	%
Self-evaluated HPV-related knowledge level		
Not at all	74	16.9
Limited	227	51.9
General understanding	71	16.2
Relatively well	58	13.3
Very well	7	1.6
Demands of HPV-related knowledge		
No need at all	4	0.9
Not very much	2	0.5
Neutral	26	6.0
In relative demand	154	35.2
Great demand	251	57.4
Acquisition of HPV-related information before 1 st clinic visit		
Active searching	100	22.9
Passive acquisition	321	73.5
Never had any information	16	3.7

Supplemental Table S3. Degree of assurance in seeking information (*n* = 100)

Degree of assurance	N	%
Not sure at all	2	2.0
Not very sure	45	45.0
Neutral	42	42.0
Relatively sure	8	8.0
Very sure	3	3.0

Supplemental Table S4. Perceptions of obstacles during information acquisition process (n = 100)

Items	Strongly disagree (n, %)	Slightly disagree (n, %)	Neither agree nor disagree (n, %)	Slightly agree (n, %)	Strongly agree (n, %)	Average score
Don't know how to find information	20 (20%)	24 (24%)	35 (35%)	16 (16%)	5 (5%)	2.62
It is strenuous to find information	12 (12%)	18 (18%)	31 (31%)	28 (28%)	11 (11%)	3.08
The information found is not what I want	12 (12%)	27 (27%)	29 (29%)	27 (27%)	5 (5%)	2.86
The information found is difficult to understand	9 (9%)	21 (21%)	46 (46%)	14 (14%)	10 (10%)	2.95
Total	53 (13.25%)	90 (22.50%)	141 (35.25%)	85 (21.25%)	31 (7.75%)	2.88

Supplemental Table S5. Usage frequency of information channels for those who actively seeking information (n = 100)

Information source	Never (n, %)	Rarely (n, %)	Sometimes (n, %)	Often (n, %)	Always (n, %)	Average score
Newspapers and magazines	35 (35%)	26 (26%)	21 (21%)	13 (13%)	5 (5%)	2.27
Books and literatures	21 (21%)	23 (23%)	31 (31%)	16 (16%)	9 (9%)	2.69
Radio	23 (23%)	24 (24%)	27 (27%)	16 (16%)	10 (10%)	2.66
Television	20 (20%)	25 (25%)	33 (33%)	15 (15%)	7 (7%)	2.64
Search engines	7 (7%)	3 (3%)	22 (22%)	31 (31%)	37 (37%)	3.88
Medical care personnel	6 (6%)	17 (17%)	38 (38%)	25 (25%)	14 (14%)	3.24
Relatives and friends	15 (15%)	25 (25%)	37 (37%)	14 (14%)	9 (9%)	2.77
WeChat official account	8 (8%)	11 (11%)	31 (31%)	26 (26%)	24 (24%)	3.47
Online consulting	21 (21%)	24 (24%)	29 (29%)	20 (20%)	6 (6%)	2.66
Seminars	42 (42%)	22 (22%)	24 (24%)	9 (9%)	3 (3%)	2.09
Community personnel	41 (41%)	24 (24%)	23 (23%)	8 (8%)	4 (4%)	2.1
Total	239 (21.73%)	224 (20.36%)	316 (28.73%)	193 (17.55%)	128 (11.6%)	2.77

Supplemental Table S6. Basic information of doctor-patient communication (n = 437)

Item	N	%
Length of communication with your doctor		
2-3 min/visit	170	38.9
4-5 min/visit	200	45.8
6-9 min/visit	47	10.8
≥ 10 min/visit	20	4.6
Satisfaction with the communication		
Very satisfied (score: 5)	33	7.6
Relatively satisfied (score: 4)	159	36.4
Neither satisfied nor unsatisfied (score: 3)	183	41.9
Slightly unsatisfied (score: 2)	57	13.0
Strongly unsatisfied (score: 1)	5	1.1

Supplemental Table S7. Correlation of doctor-patient communication satisfaction with communication experience and effectiveness (n = 437)

Dimension	Item	r	p value
Communication experience	The doctor communicated with me in a way that I could understand.	0.518	< 0.001
	During communication, the doctor cared about my feelings and emotions.	0.555	< 0.001
	The doctor fully explained the treatment plan.	0.502	< 0.001
	During communication, the doctor was patient with me.	0.581	< 0.001
Communication effectiveness	The communication helped me understand the information. (Cognitive)	0.508	< 0.001
	The communication alleviated my panic and stress. (Emotion)	0.506	< 0.001
	Would accept treatment or preventive measures of HPV as recommended by the doctor. (Behavior)	0.170	< 0.001
Communication expectation	Duration of time the doctor spent in communication.	0.234	< 0.001
	How the doctor asks questions.	0.248	< 0.001
	The doctor's tone during communication.	0.236	< 0.001
	The doctor's facial expression, eye contact, and body language, etc.	0.243	< 0.001

Supplementary Figures

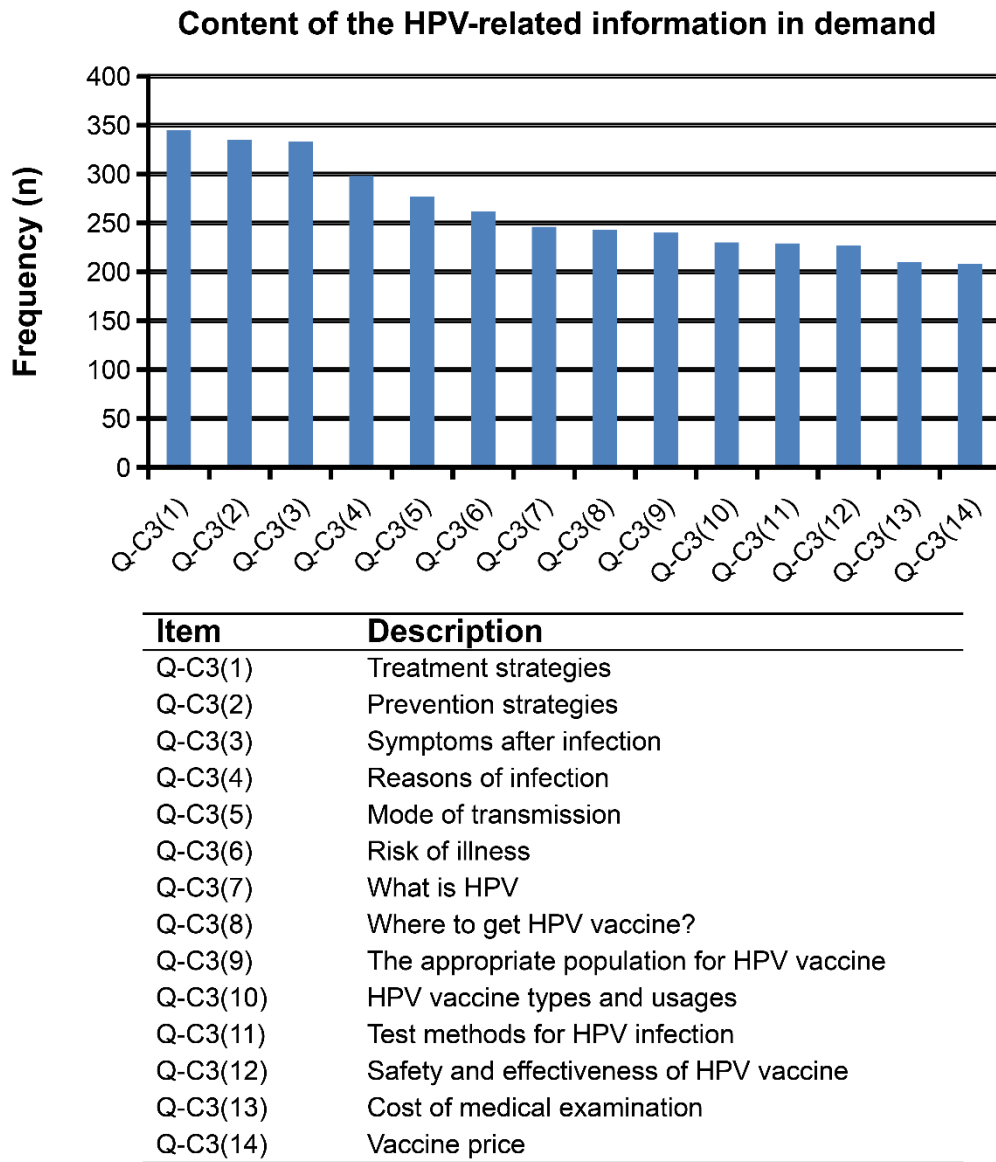


Figure S1. Content of the HPV-related information in demand.

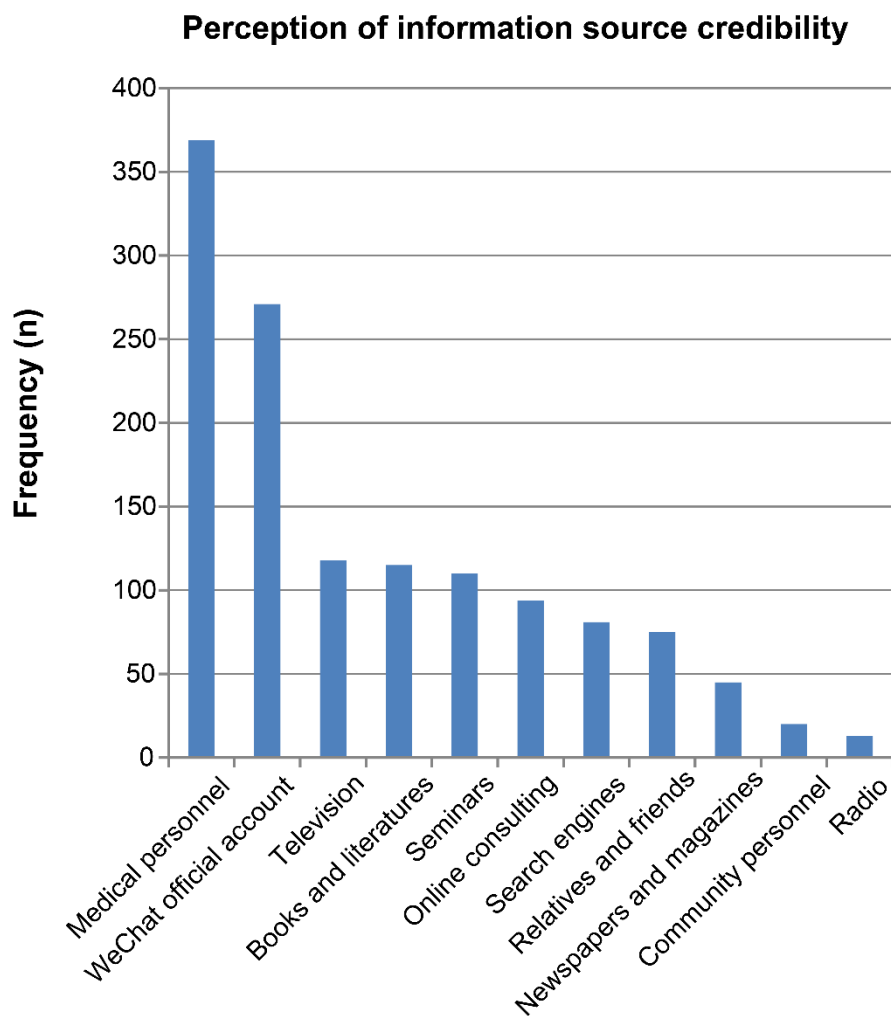
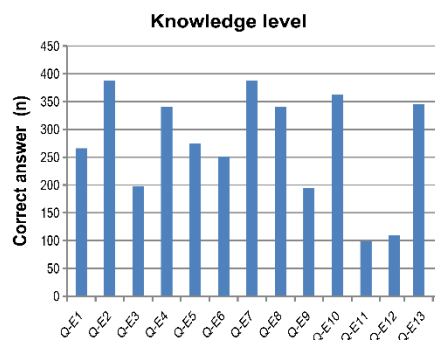


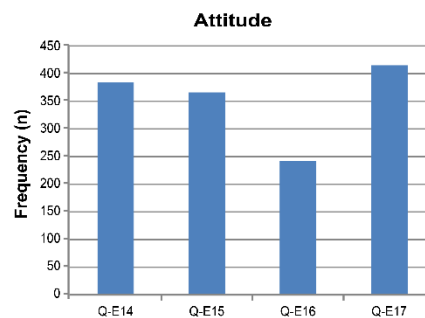
Figure S2. Perception of information source credibility.

A



Item	Description
Q-E1	Sexual transmission
Q-E2	HPV infection will cause cervical cancer
Q-E3	Most HPV infected persons have no symptoms
Q-E4	Males can also infect HPV
Q-E5	Women are more likely to infect HPV
Q-E6	Can be cleared by the immune system
Q-E7	Multiple sexual partners and unprotected sex increases the risk of HPV infection
Q-E8	Early sexual activity increases the risk of HPV infection
Q-E9	Quit smoking and alcohol consumption can prevent HPV infection
Q-E10	Improve health condition can prevent HPV infection
Q-E11	There is effective drug treatment for HPV infection
Q-E12	Vaccine is still protective for those tested HPV positive
Q-E13	Women without sex life need to be vaccinated

B



Item	Description
Q-E14	Will let children get HPV vaccine
Q-E15	Will recommend relatives and friends to get HPV vaccine
Q-E16	Get your own HPV vaccine
Q-E17	Screening is important

Figure S3. (A) HPV-related knowledge level and (B) Attitudes towards HPV vaccination and screen.

The questionnaire Information is completely confidential

HPV-Related Information Questionnaire



Number: _____

Date: _____

This survey aims to identify the obstacles in effective communication of HPV-related information so as to develop more available and helpful educational materials. Your answers will help us to achieve this goal, please answer the questionnaire independently, thank you for your cooperation!

Section A. Basic information

1. Age category (year): <30 31-40 41-50 ≥51
2. Education level: ≤Higher school Junior college College Graduate school
3. Marital status: Married Cohabitation Divorced Widowed
 Separated Single
4. Monthly income (RMB): <2,499 2,500-4,999 5,000-9,999 ≥10,000
5. Occupation: Farmer Worker Teacher Government Private
 Student Retired Unemployed Other
6. Which province are you from: _____

Section B. Health status

1. Overall, you rate your health condition as: [Please choose one best answer.]
 - A. Very poor
 - B. Relatively poor
 - C. Average
 - D. Relatively healthy
 - E. Very healthy
2. Do you undergo regular cervical cancer screening? [Please choose one best answer.]
 - A. Never
 - B. Occasionally
 - C. On a regular basis
3. The result of your last HPV test is: [Please choose one best answer.]
 - A. HPV16+ and/or HPV18+
 - B. Infected with other high-risk HPV subtypes
 - C. Infected with low-risk HPV subtypes
 - D. Both high- and low- risk HPV subtypes

- E. HPV negative
- F. Not sure

Section C. Information acquisition and seeking

1. How much do you know about HPV? [Please choose one best answer.]

- A. Not at all
- B. Not much
- C. General understanding
- D. Relatively well
- E. Very well

2. Do you need to know about HPV related information regarding prevention and treatment?

- A. No need at all [Please skip to Question 4]
- B. Not very much
- C. Neutral
- D. In relative demand
- E. Great demand

3. What do you want to know about HPV? [Please select all that apply.]

	Item	Description
<input type="checkbox"/>	(1)	Treatment strategies
<input type="checkbox"/>	(2)	Prevention strategies
<input type="checkbox"/>	(3)	Symptoms after infection
<input type="checkbox"/>	(4)	Reasons of infection
<input type="checkbox"/>	(5)	Mode of transmission
<input type="checkbox"/>	(6)	Risk of illness
<input type="checkbox"/>	(7)	What is HPV
<input type="checkbox"/>	(8)	Where to get HPV vaccine?
<input type="checkbox"/>	(9)	The appropriate population for HPV vaccine
<input type="checkbox"/>	(10)	HPV vaccine types and usages
<input type="checkbox"/>	(11)	Test methods for HPV infection
<input type="checkbox"/>	(12)	Safety and effectiveness of HPV vaccine
<input type="checkbox"/>	(13)	Cost of medical examination
<input type="checkbox"/>	(14)	Vaccine price

4. How do you know HPV-related information before coming to the clinic? [Please choose one best answer.]

- A. Active searching
- B. Passive acquisition [Please skip to Question 8]
- C. Never had any information [Please skip to Question 8]

5. Are you sure you can find the HPV information you need? [Please choose one best answer.]

- A. Not sure at all
- B. Not very sure
- C. Neutral
- D. Relatively sure
- E. Very sure

6. When looking for HPV related information, how much do you agree with the following statements? [Please select one item from each row.]

Items	Strongly disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Strongly agree
(1) Don't know how to find information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) It is strenuous to find information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) The information found is not what I want	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) The information found is difficult to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Through which channels do you search for HPV-related information, and how often do you use these channels? [Please select one item from each row. If you have not used the channel, you may choose never used it.]

Information source	Never	Rarely	Sometimes	Often	Always
Newspapers and magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Books and literatures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Television	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search engines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical care personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relatives and friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WeChat Official Account	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online consulting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seminars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Have you ever noticed the following ways in which you might be exposed to HPV-related information? [Please select all that apply.]

	Item	Channel
<input type="checkbox"/>	(1)	Newspaper and magazines
<input type="checkbox"/>	(2)	Radio
<input type="checkbox"/>	(3)	Surfing the web
<input type="checkbox"/>	(4)	Books
<input type="checkbox"/>	(5)	Articles from WeChat official account
<input type="checkbox"/>	(6)	Community bulletin board
<input type="checkbox"/>	(7)	Hospital health promotion materials and health education
<input type="checkbox"/>	(8)	Communicating with the doctor
<input type="checkbox"/>	(9)	Communicating with relatives
<input type="checkbox"/>	(10)	Outdoor media

9. Please choose three sources of health information that you trust most from the following list?

	Item	Description
<input type="checkbox"/>	(1)	Newspaper and magazines
<input type="checkbox"/>	(2)	Television
<input type="checkbox"/>	(3)	Radio
<input type="checkbox"/>	(4)	Books and literatures
<input type="checkbox"/>	(5)	Search engine
<input type="checkbox"/>	(6)	Medical staff
<input type="checkbox"/>	(7)	Relatives and friends
<input type="checkbox"/>	(8)	WeChat official account

- (9) Online consulting
 - (10) Seminars
 - (11) Community personnel
-

10. Have you ever tried to avoid information about HPV? [Please choose one best answer.]

- A. Yes B. No [Please skip to Section D, Question 1.]

11. Why have you tried to avoid HPV-related information? [Please select all that apply.]

- A. This information has nothing to do with me.
- B. I have already known a lot about this.
- C. The information is mixed up and it is difficult to distinguish the truth.
- D. Knowing this information will cause anxiety.
- E. This information is disgraceful.
- F. Knowing this information doesn't help. It's hard to change behavior or cure the disease.

Section D. Doctor-patient communication

1. The average length of communication with your doctor? [Please choose one best answer.]

- A. 2-3 min/visit
- B. 4-5 min/visit
- C. 6-9 min/visit
- D. ≥ 10 min/visit

2. Have you reached out to your doctor about HPV-related knowledge? [Please choose one best answer.]

- A. Yes
- B. No

3. In general, are you satisfied with the communication? [Please choose one best answer.]

- A. Strongly unsatisfied
- B. Slightly unsatisfied
- C. Neither satisfied nor unsatisfied
- D. Relatively satisfied
- E. Very satisfied

4. Based on your recent experience of communicating with your doctor, do you agree with the following statement? [Please select one item from each row.]

Items	Strongly disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Strongly agree
(1) I actively asked the doctor questions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) The doctor communicated with me in a way that I could understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) The communication helped me understand the information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) During communication, the doctor cared about my feelings and emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(5) The doctor fully explained the treatment plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(6) During communication, the doctor was patient with me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(7) The communication alleviated my panic and stress.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How much do you care about the following four aspects when communicating with doctors?
 [Please select one item from each row.]

Items	Not at all	Not very much	Neutral	Slightly care	Very care
(1) Duration of time doctor spent in communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) How doctors ask questions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) The doctors' tone during communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) The doctors' facial expression, eye contact, and body language, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Will you accept the recommended treatment or preventive measures by the doctor? [Please choose one best answer.]

- A. Will not accept
- B. Not sure
- C. Partially accept
- D. Completely accept

7. Will you share your knowledge of HPV prevention and treatment with your relatives and friends?

[Please choose one best answer.]

- A. No
- B. Not sure
- C. Yes

8. If you have been aware of HPV related information in a hospital setting, please select the channel. [Please select all that apply.]

Item	Description
<input type="checkbox"/> (1)	Never noticed
<input type="checkbox"/> (2)	Educational videos at the waiting area

- (3) Posters
 - (4) Leaflets and brochures at the outpatient clinic
 - (5) WeChat official account of the hospitals
 - (6) Hospital official website
 - (7) WeChat official account of the doctors
 - (8) Hospital events and seminars
 - (9) Other
-

Section E. Knowledge and attitude

The following are multiple choice questions. Please choose one best answer.

1. Does human papillomavirus (HPV) transmitted sexually?
 A. Yes B. No C. Don't know
2. Chronic infection with high-risk HPV will cause cervical cancer.
 A. Yes B. No C. Don't know
3. Most people infected with HPV have no symptoms.
 A. Yes B. No C. Don't know
4. Males can also infect HPV.
 A. Yes B. No C. Don't know
5. Women are more likely to infect HPV.
 A. Yes B. No C. Don't know
6. HPV can be cleared by the immune system.
 A. Yes B. No C. Don't know
7. Multiple sexual partners and unprotected sex increase the risk of HPV infection.
 A. Yes B. No C. Don't know
8. Early sexual activity increases the risk of HPV infection.
 A. Yes B. No C. Don't know
9. Quit smoking and alcohol consumption can prevent HPV infection.
 A. Yes B. No C. Don't know
10. Improve health condition can prevent HPV infection.
 A. Yes B. No C. Don't know
11. There is effective drug treatment for HPV infection.
 A. Yes B. No C. Don't know
12. Vaccine is still protective for those tested HPV positive.
 A. Yes B. No C. Don't know
13. Women without sex life need to be vaccinated.
 A. Yes B. No C. Don't know
14. Will you let your children get HPV vaccine?
 A. Yes B. No C. Don't know
15. Will you recommend relatives and friends to get HPV vaccine?
 A. Yes B. No C. Don't know

16. Are you planning to get HPV vaccine?

- A. Already vaccinated B. Yes C. No D. Not sure

17. Screening is important.

- A. Yes B. No C. Don't know