Evidence for the construct validity of the Patient Anal Cancer Knowledge Scale (PACKS) among a sample of Black and Hispanic sexual and gender minorities

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INTRODUCTION

- **Purpose**: To evaluate the construct validity of the Patient Anal Cancer Knowledge Scale (PACKS).
- **Background**: Anal cancer disproportionately impacts Black and Hispanic men who have sex with men and transgender women (MSM/TGW) who have high rates of HIV. Lack of anal cancer information is a major barrier to the utilization of primary and secondary prevention (i.e., vaccination and screening).

METHODS

- **Sample**: Black and Hispanic MSM/TGW (aged 18–30 years) in the U.S. who were participants in larger cohort study (N=284).
- **Inclusion**: Participants aware of anal cancer were administered the PACKS (n=188).
- **Hypotheses**: We hypothesized as a 3-factor scale representing (1) risk and primary prevention (9-items), (2) symptoms (5-items), and (3) screening (3-items).
- **Analysis**: Construct validity was assessed using Confirmatory Factor Analysis and bivariate statistics.

CONCLUSIONS

- **Key finding:** Results provide evidence for the internal structure and expected associations with relevant variables.
- **Implications**: The PACKS can be used to inform patient education and shared clinical decision making for anal cancer prevention.
- **Future research**: Replicate findings in other samples of high-risk populations.
- **Limitations**: Small non-probability sample of MSM/TGW.

The Patient Anal Cancer Knowledge Scale (PACKS) demonstrated good construct validity related to anal cancer risk/prevention, symptoms, and screening.

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RESULTS

- **Anal cancer awareness**: 64.8%; higher among HPV vaccinated.
- **3-Factor Model Fit**: The 3-factor model demonstrated adequate fit (RMSEA=0.02; CFI=0.99).
- **Factor loadings**: All items loaded on their respective factors (p<0.01; Table 2).
- **Scale scores:** Factor 1 (M=3.5; SD=2.3; Range:0-9); Factor 2 (M=2.9; SD=1.9; Range:0-5;); Factor 3 (M=2.0; SD=1.2; Range:0-3).
- **Bivariate associations**: Previous HPV vaccination was positively correlated with factors 1-3, respectively (r=0.25, 0.16, 0.15; p<0.05).
- **Multivariable associations**: Previous HPV vaccination was independently correlated with higher PACKS scores (Figure 1).

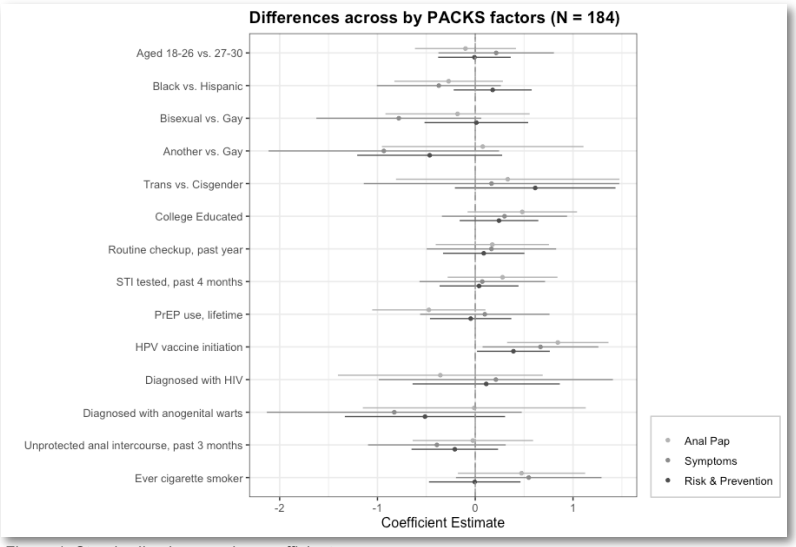

Figure 1. Standardized regression coefficients

Table 1. Sample characteristics stratified by awareness of anal cancer

Characteristic	Aware of Anal Cancer			p-value[1]
	Overall N = 284	No N = 100	Yes N = 184	
Age groups, No. (%)				0.8
27-30	150 (52.8%)	54 (54.0%)	96 (52.2%)	
18-26	134 (47.2%)	46 (46.0%)	88 (47.8%)	
Ethnoracial identity, No. (%)				0.6
Hispanic/Latino	185 (65.1%)	63 (63.0%)	122 (66.3%)	
Non-Hispanic Black	99 (34.9%)	37 (37.0%)	62 (33.7%)	
Sexual identity, No. (%)				0.6
Gay/Same gender loving	225 (79.2%)	82 (82.0%)	143 (77.7%)	
Bisexual/Pansexual	35 (12.3%)	10 (10.0%)	25 (13.6%)	
Another sexual identity	24 (8.5%)	8 (8.0%)	16 (8.7%)	
Gender identity, No. (%)				0.5
Cisgender man	266 (93.7%)	95 (95.0%)	171 (92.9%)	
Gender expansive	18 (6.3%)	5 (5.0%)	13 (7.1%)	
College educated, No. (%)	181 (63.7%)	58 (58.0%)	123 (66.8%)	0.14
Routine checkup, 12 months, No. (%)	180 (63.4%)	57 (57.0%)	123 (66.8%)	0.10
STI tested, 4 months, No. (%)	165 (58.1%)	56 (56.0%)	109 (59.2%)	0.6
PrEP use, lifetime, No. (%)	182 (64.1%)	67 (67.0%)	115 (62.5%)	0.5
HPV vaccine initiation, No. (%)	133 (46.8%)	38 (38.0%)	95 (51.6%)	**0.028**
Diagnosed with HIV, No. (%)	18 (6.3%)	6 (6.0%)	12 (6.5%)	0.9
Diagnosed with anogenital warts, No. (%)	12 (4.2%)	2 (2.0%)	10 (5.4%)	0.2
Unprotected anal intercourse, 3 months, No. (%)	212 (74.6%)	70 (70.0%)	142 (77.2%)	0.2
Ever smoker, No. (%)	52 (18.3%)	20 (20.0%)	32 (17.4%)	0.6

[1] Pearson's Chi-squared test; Fisher's exact test

Table 2. CFA factor loadings

Items		% Correct	Factor 1 Anal cancer risk and primary prevention (α = 0.71)	Factor 2 Anal cancer symptoms (α = 0.85)	Factor 3 Anal cancer screening (α =0.79)
1	Can receptive anal sex ("bottoming") increase a person's risk for anal cancer?	53.2%	0.62		
2	Does smoking cigarettes increase a person's risk for anal cancer?	43.6%	0.42		
3	Can HPV (human papillomavirus) cause anal cancer?	67.0%	0.73		
4	Does Herpes cause anal cancer? *	28.2%	0.50		
5	Does HIV increase a person's risk for anal cancer?	42.6%	0.70		
6	Are people who previously had genital or anal warts more likely to develop anal cancer later in life?	42.0%	0.69		
7	Is there a vaccine that is proven to prevent anal cancer?	13.8%	0.79		
8	Can using condoms help prevent anal cancer?	41.5%	0.74		
9	Will eating a high fiber diet prevent anal cancer? *	18.5%	0.41		
10	Bleeding or a bloody discharge from the anus	60.6%		0.92	
11	Feeling a lump or mass in the anus	75.5%		0.95	
12	Persistent or recurring anal itching	39.4%		0.83	
13	Persistent or recurring pain in the anal area	61.2%		0.94	
14	Change in bowel habits such as going to the bathroom more or less frequently	50.0%		0.86	
15	What is the purpose of an anal Pap test? – To check for cancer cells	70.2%			0.88
16	Who is eligible to receive an anal pap test? – Anyone at risk for anal cancer	70.7%			0.81
17	What does it mean if you have an abnormal anal Pap test? - You have abnormal cells that might turn into cancer	56.9%			0.99

Note. Three factor model demonstrated good fit to the data (RMSEA = 0.02; CFI = 0.99; SRMR = 0.08)
Factor correlations: F1-F2 (0.74); F1-F3 (0.64); F2-F3 (0.55)