Psychosocial Predictors of the Intention to Vaccinate Children against HPV: A Cross-cultural Study of Parents from the US, the UK, and Germany

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Abstract

Human Papillomavirus (HPV) can cause various types of cancer, especially cervical cancer. However, vaccination rates in Germany are low in comparison to the UK and US. An online questionnaire with 1457 parents from the US, UK, and Germany measured various predictors of the vaccination intention. In all three countries vaccination intention correlated significantly with variables of the theory of planned behavior (TPB), the health belief model (HBM), knowledge about HPV vaccination, trust, conspiracy and anticipated regret. The highest correlations were observed with attitude towards HPV vaccination. Vaccination intention never correlated significantly with knowledge about HPV, communication and health insurance. Results about the fit of our theory based structural equation model were mixed.

Theoretical Background

Structural equation modeling





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Adequate model fit (*CFI* = .913; *RMSEA* = .047; *PNFI* = .781) except for χ^2 = 4635.656, df = 2447, p < .000 and SRMR = .111

Model explains 69.1 % of the variance in vaccination intention.

Although, the HPV-vaccination effectively reduces the risk of developing various types of cancer (e.g. cervical cancer) (Kombe et al., 2021), vaccination rates in Germany are low in comparison to the UK and US. According to the Robert Koch Institut (RKI) only 51% of the 18year old girls and 1.3% of the boys were vaccinated against HPV in 2018. In the US and the UK the vaccination rates for girls were 61 % (Pingali et al., 2021) to 76 % (Rai et al., 2020) and for boys 56% (Pingali et al., 2021) to 65% (Rai et al., 2020).

Possible predictors of vaccination behavior are provided by the theory of planned behavior (TPB) (Ajzen, 1991), the health belief model (HBM) (Rosenstock, 1974) and previous studies on vaccination intentions (e.g. Caso et al., 2019, 2021) (Fig. 1).

Hypotheses

H1: Attitude towards HPV vaccination, perceived risk of HPV infection, Perceived effectiveness of HPV vaccination, general attitude towards childhood vaccination, knowledge about HPV and HPV vaccination, Trust in science, doctors and health care institutions, subjective norms, doctor's recommendation, perceived behavioral control, communication, anticipated regret of the HPV infection and health insurance correlate positively with the vaccination intention.

H2: Perceived risk of HPV vaccination, belief in conspiracy theories and conspiracy mentality, anticipated regret of the HPV vaccination and external obstacles correlate negatively with the vaccination intention.

Method

Sample

1457 parents of 1751 unvaccinated children of recommended vaccination age (9 (11 UK) -17).



Fig 1. Predictors of vaccination behavior in Germany Variables of the HBM, Variables of the TPB, Variables of previous

p - values: < .000 ***, 0.001 **, < 0.05*,

UK

- Adequate model fit (CFI = .900; RMSEA = .055; *PNFI* = .735) except for χ^2 = 4109.581, *df* = 2447, *p* < .000 and SRMR = .119
- Model explains **78.5** % of the variance in vaccination intention.





US

- Adequate model fit (*CFI* = .926; *RMSEA* = .051; *PNFI* = .784) except for χ^2 = 4235.426, *df* = 2447, *p* < .000 and SRMR = .094

		GE (Qualtrics)	US (Prolific)	UK (Prolific)
n	parents	659	398	400
	children	824	516	411
Age (MW, SD)	parents	38.892, 8.710	42.117, 8.092	42.790, 8.162
Gender (% female)	parents	65.06	49.49	49.87
	children	51.60	46.318	55.718

Measures

- Online self-report questionnaire (30 minutes) Qualtrics
- Instruments indexed in fig. 1

Results

Correlations (r) with vaccination intention

	Attitude HPV vacc	Risk vacc	Risk infection	Effect vacc	Attitude vacc	Knowledge HPV / vacc	Trust doc / sci / ins	Consp T / Consp M	Norms	Doctor`s recommen dation	PB Control	Commu nication	Regret infection	Regret vacc	External obstacles	Health insurance
GE	.736	447	.702	.674	.641	.077/ <mark>.098</mark>	.392/ .511/ .563	38/ 133	.575	.363	.578	.058	.633	289	106/ 106	(129)
UK	.820	650	.656	.760	.751	.092/ <mark>.199</mark>	.492/ .586/ .667	595/ 271	.595	111	.563	.018	.695	355	136/ 182	074
US	.837	645	.694	.746	.64	.073/ <mark>.112</mark>	.516/ .519/ .658	577/ 304	.727	.168	.308	044	.752	308	.021/ 042	027

p - values: significant correlations (p < .05) presented in dark blue or turquoise

Attitude HPV vacc = positive attitudes toward the HPV vaccination, Risk vacc = perceived risk of HPV vaccination, Risk infection = perceived risk of HPV infection, Effect vacc = perceived effectiveness of HPV vaccination, Attitude vacc = general attitude towards childhood vaccination, Knowledge HPV/ vacc = knowledge about HPV and HPV vaccination, Consp T = vaccination conspiracy theories, Consp M = conspiracy mentality, Norms = subjective norms about HPV vaccination, PB Control = perceived behavioral control, Regret = anticipated regret, external obstacles = accessibility / affordability

p - values: < .000 ***, 0.001 **, < 0.05*,

Discussion

- Hypotheses were partially supported by the data.
- Attitudes play the biggest role in vaccination decisions, while knowledge, accessibility, affordability and health insurance seem to be less influential in all three countries.
- Considering the significant determinants of vaccination intentions and visible differences between the three countries will help to design effective interventions and identify structural obstacles and cultural differences.

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Model explains 84.7 % of the variance in vaccination intention.

Deutsche Krebshilfe

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