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Using the Theoretical Domains Framework to investigate clinicians' behavioural determinants of antimicrobial prescribing in Qatar

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Background

- Antimicrobial stewardship (AMS) interventions aim to improve antimicrobial prescribing behaviours.
- A systematic review by Talkhan *et al* demonstrated no optimal use of theory to inform the design/ choice of interventions¹.
- Emphasis should be placed on using theory to identify behavioural determinants of antimicrobial prescribing.

Aim

- To identify and quantify behavioural determinants of antimicrobial prescribing, using the Theoretical Domains Framework (TDF).

Study characteristics

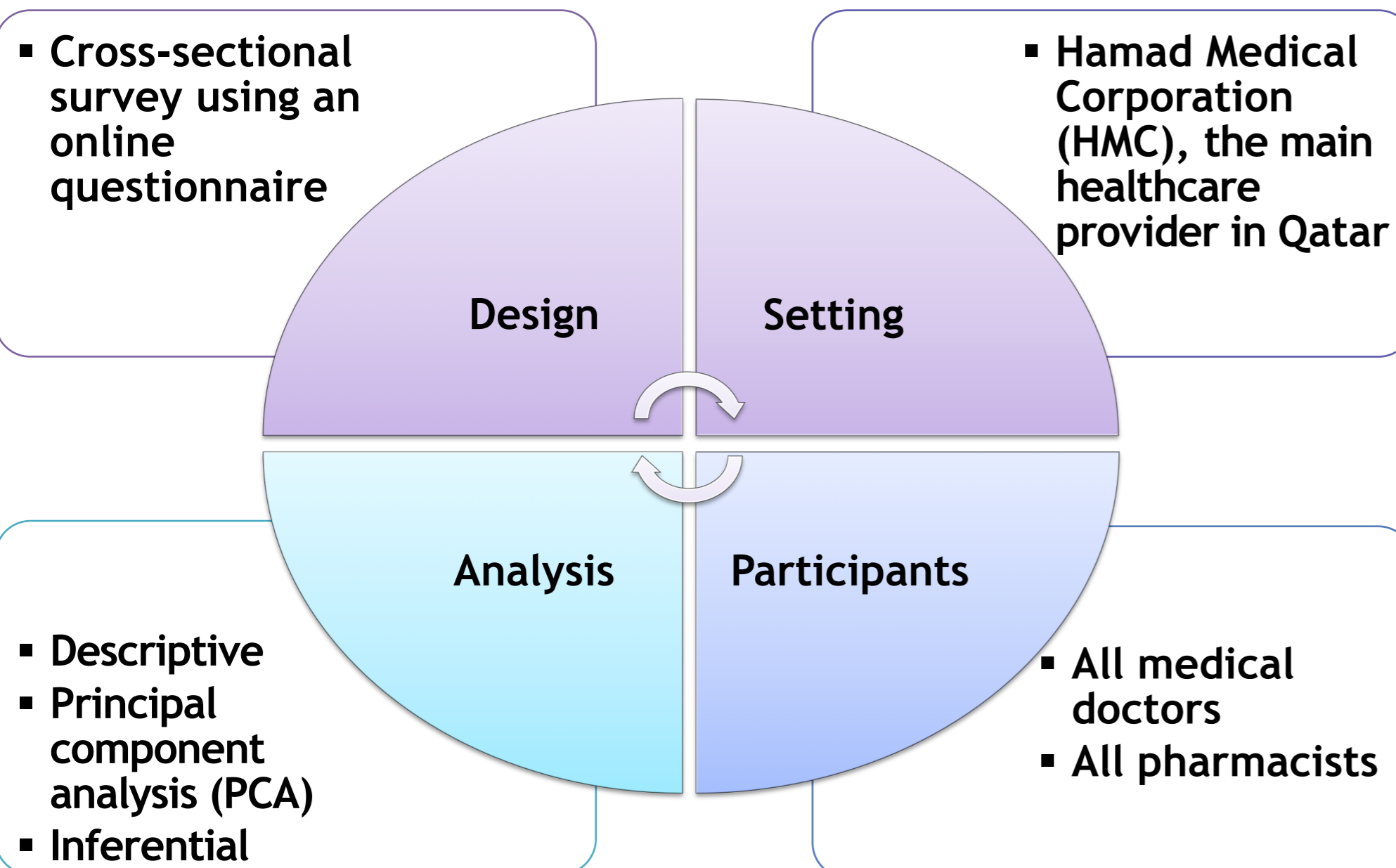


Figure 1. The key characteristics of the study

Method

- An online questionnaire was developed with reference to the Determinants of Implementation Behaviour Questionnaire².
- Questionnaire development followed a rigorous iterative process.
- Question types were closed, 5-point Likert scales (scored 5=Strongly agree to 1=Strongly disagree) and open to allow free text comments.
- Data analysis investigated the behavioural determinants and influential factors.

Results

- 535 responses were received from clinicians currently prescribing/recommending antimicrobials in HMC, Qatar.
- PCA showed a three component (C) solution with components incorporating a number of questionnaire items labelled:
 - C1: Guidelines compliance (8 items)
 - C2: Influences on antimicrobial practice (7 items)
 - C3: Self-efficacy in antimicrobial practice (5 items)

Table 1. Respondents' demographics (N=535)

Characteristic	% (n)	
Profession	Doctor	63.4 (339)
	Pharmacist	36.6 (196)
Highest academic qualification	Undergraduate	33.3 (178)
	Postgraduate	43.4 (232)
	Doctorate	22.8 (122)
	Other	0.5 (3)
Main practice setting	Secondary care	65.8 (352)
	Tertiary care	33 (176)
	Other	1.2 (7)
Gender	Male	64.7 (346)
	Female	34.6 (185)
	Prefer not to say	0.7 (4)
Experience as health professional	≤5 years	53.3 (285)
	6-10 years	34.6 (185)
	≥11 years	12.1 (65)

PCA analysis

- PCA scale scores were calculated through summation of Likert scores for items in each component (see example Table 2).
- Cronbach's α for all components was >0.7 showing internal consistency of the scales.
- The median scale score (possible range, midpoint) for each scale was C1: 32 (8 to 40, 24), C2: 26 (7 to 35, 21) and C3: 20 (5 to 25, 15).
- C2 and C3 scales show lower levels of agreement than C1 with the medians closer to the midpoint.

Table 2. C2 statement responses, linked to TDF (N=535, missing=16)

TDF Domain	Statement	Strongly agree % (n)	Agree % (n)	Unsure % (n)	Strongly disagree % (n)	Disagree % (n)	NA % (n)
Environmental context & resources	I have sufficient support from specialists to enable me to prescribe/ recommend antimicrobials according to the guidelines	7.3 (39)	80 (428)	5.8 (31)	3.2 (17)	0.6 (3)	0.2 (1)
	I have undertaken sufficient continuing professional development to prescribe/ recommend antimicrobials according to the guidelines	17.6 (94)	60.4 (323)	7.5 (40)	11 (59)	0.4 (2)	0.2 (1)
Social influences	Members of the multidisciplinary team prescribe/ recommend antimicrobials according to the guidelines	6.2 (33)	78.7 (421)	9 (48)	2.4 (13)	0.6 (3)	0.2 (1)
	Prescribing/ recommending antimicrobials according to the guidelines is encouraged by my peers	6.9 (37)	73.5 (393)	13.3 (71)	3 (16)	0.2 (1)	0.2 (1)
	Prescribing/ recommending antimicrobials according to the guidelines is encouraged by superiors	9.2 (49)	72.5 (388)	12 (64)	3 (16)	0.4 (2)	0
Behavioural regulation	Patients put me under pressure to prescribe/ recommend antimicrobials outside the guidelines	4.5 (24)	36.1 (193)	9.3 (50)	31.8 (170)	13.6 (73)	1.7 (9)
	I have ways of monitoring the quality of my prescribing/ recommending of antimicrobials	2.1 (11)	78.5 (420)	12.3 (66)	3 (16)	0.6 (3)	0.6 (3)

Inferential analysis

- PROFESSION:** 'Pharmacists' scores were lower than 'Doctors' indicating lower levels of pharmacists' agreement.
- QUALIFICATION:** 'Undergraduate' scores were lower compared to others indicating lower levels of agreement of less qualified clinicians.
- EXPERIENCE:** '≤5 years' scores were lower compared to others indicating lower levels of agreement of less experienced clinicians.

Table 3. Inferential analysis comparing PCA scale scores with respondents' demographics

Demographic	Test	C1	C2	C3	Post-hoc analysis
Profession	Mann-Whitney	P<0.001	P<0.001	P=0.010	-
Highest academic qualification	Kruskal-Wallis	P<0.001	P<0.001	P=0.009	C1: Adj Sig P<0.001, P<0.001 resp C2: Adj Sig P<0.001, P<0.001 resp C3: significant only for undergraduate v doctorate (Adj Sig P=0.006)
Experience as health professional	Kruskal-Wallis	P=0.017	P<0.001	P=0.224	C1: significant only for 6-10 years v ≥11 years (Adj Sig P=0.013) C2: Adj Sig P<0.001, P=0.001 resp

Conclusion

- Social influences, staff development and quality monitoring, with a focus on pharmacists and early career clinicians, may be useful targets for behaviour change interventions to improve antimicrobial practice.
- The findings can contribute to generating new and more effective AMS strategies in the Middle East and allaying global concern about antimicrobial resistance.
- More in-depth exploration is required to select and test appropriate linked behaviour change techniques.

References

- Talkhan H, Stewart D, McIntosh T, Ziglam H, Abdulrouf P, Al-Hail M *et al*. The use of theory in the development and evaluation of behaviour change interventions to improve antimicrobial prescribing: a systematic review. *Journal of Antimicrobial Chemotherapy*. 2020;75(9):2394-2410.
- Huijg J, Gebhardt W, Dusseldorp E, Verheijden M, van der Zouwe N, Middelkoop B *et al*. Measuring determinants of implementation behavior: psychometric properties of a questionnaire based on the theoretical domains framework. *Implementation Science*. 2014;9(1).