Guirguis LM, Hughes CA, Makowsky MJ, Sadowski CA, Schindel TJ, Yuksel N, Faruquee CF. Development and validation of a survey instrument to measure factors that influence pharmacist adoption of prescribing in Alberta, Canada. Pharmacy Practice 2018 Jan-Mar;16(1):1068 suppl2.
https://doi.org/10.18549/PharmPract.2018.01.1068

Online Appendix 2: Factor analysis

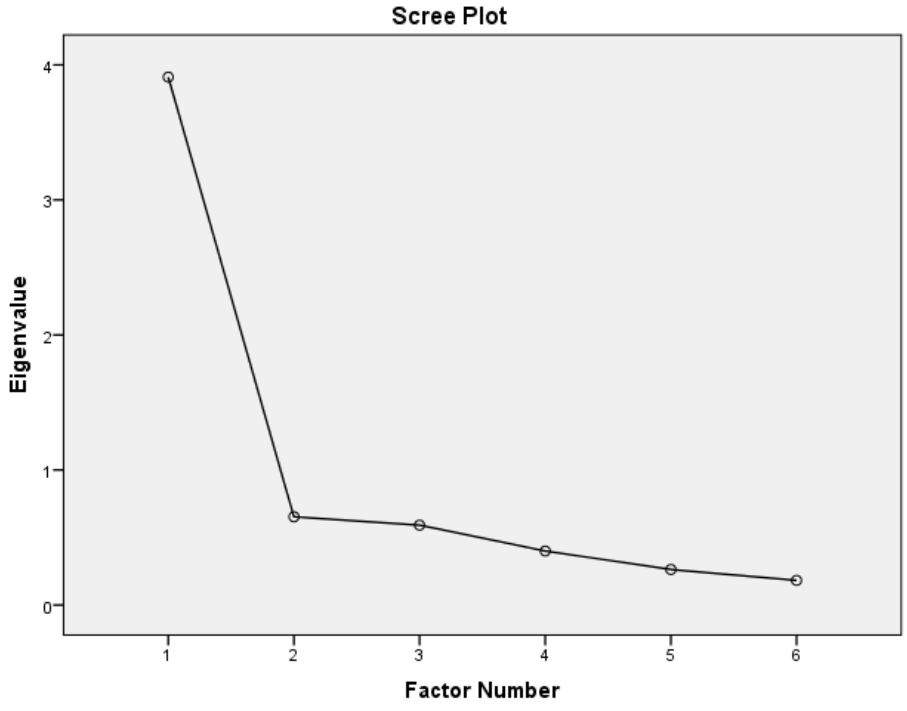
Self-efficacy

Initially, we tested the factorability of six items of question PB8 to measure Self Efficacy. Items were correlated at least 0.4 with at least one other item which suggests factorability of the items. Kaiser-Meyer-Olkin value of 0.849 confirms sample adequacy for factor analysis. Communalities are all above 0.5 suggests that each item shares common variance with other items. All the above mentioned indicators allowed us to run factor analysis with all the items of question PB8.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.910	65.161	65.161	3.508	58.461	58.461
2	.654	10.892	76.053			
3	.592	9.858	85.912			
4	.400	6.667	92.578			
5	.263	4.385	96.964			
6	.182	3.036	100.000			

Extraction Method: Principal Axis Factoring.



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Factor Matrix[a]

Item		Factor 1
PB8b	How sure are you that you could prescribe in a clinical area that you are familiar with?	.829
PB8a	How sure are you that you could perform a patient assessment to prescribe?	.814
PB8e	How sure are you that you could initiate new therapy for a patient?	.809
PB8f	How sure are you that you could accept responsibility for medication management?	.749
PB8d	How sure are you that you could adapt a prescription for patients starting a new therapy?	.728
PB8c	How sure are you that you could prescribe in a clinical area that you are not familiar with?	.641

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 5 iterations required.

First, we ran principle component analysis without any rotation to identify composite scores for the underlying factors. First factor only had Eigenvalue over one and that factor explained variance of 65.16%. The scree plot also suggested one factor solution. Then we ran exploratory factor analysis. We did not use any rotation as we have only one factor. We found only one factor with loadings of all items above 0.6. All the items of the factor explain self-efficacy belief of prescribing activities such as level of confidence of assessing patient, prescribing in familiar clinical area or non-familiar clinical area, starting a new therapy, adapting prescription, managing medication. We also tested the internal consistency of the scale using Cronbach's alpha. The alpha value was 0.892 suggesting higher reliability of self-efficacy scale.

Impact of prescribing on practice

We tested the factorability of nine items of questionnaire to measure impact of prescribing on practice in the survey (i.e. Question PB7). All the items, except PB7 c, d and i, were correlated by at least 0.3 with at least one other item. We removed PB7 c, d and i items from factor analysis due to low correlation (i.e. below 0.3). Kaiser-Meyer-Olkin value of 0.737 confirms sample adequacy for factor analysis. Communalities are all above 0.5 suggests that each item shares common variance with other items. All the above mentioned indicators allowed us to run factor analysis with the six items of question PB7.

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Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.942	49.039	49.039	2.554	42.571	42.571	2.219
2	1.315	21.924	70.963	.946	15.769	58.340	1.901
3	.672	11.197	82.160				
4	.450	7.492	89.652				
5	.345	5.751	95.403				
6	.276	4.597	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

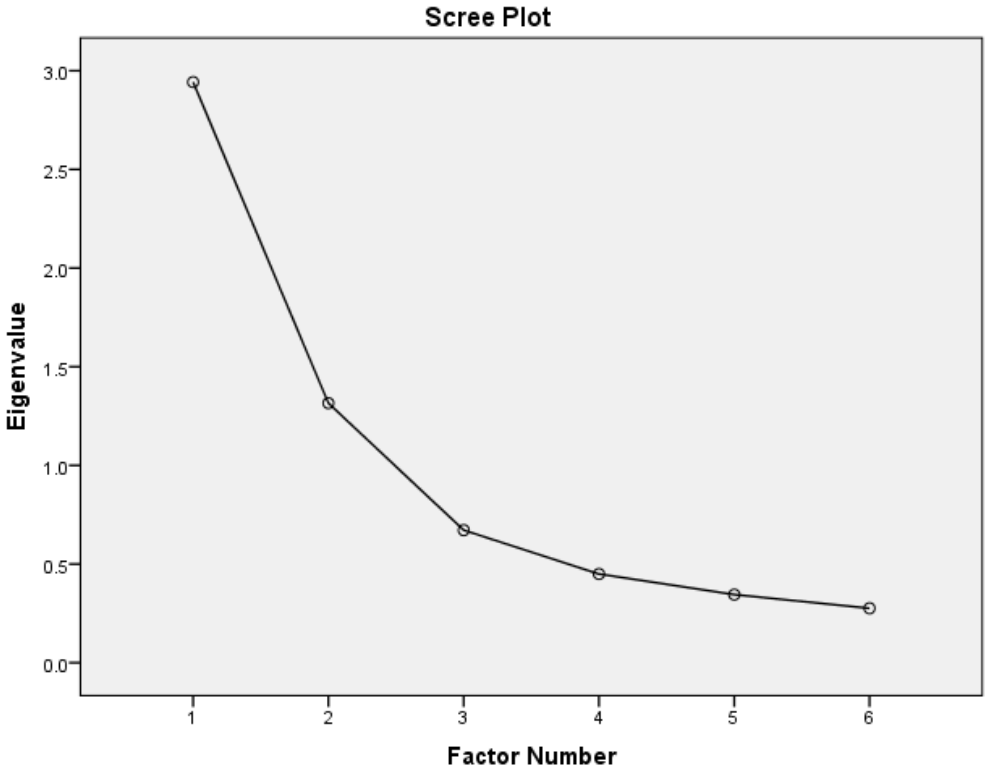
Pattern Matrix[a]

		Factor	
Item		1	2
PB7a	To what extent has prescribing impacted the following for you: Job satisfaction?	.918	
PB7b	To what extent has prescribing impacted the following for you: Professional image?	.741	
PB7h	To what extent has prescribing impacted the following for you: Quality of physician relationship?	.542	
PB7g	To what extent has prescribing impacted the following for you: Quality of patient care?	.454	.406
PB7e	To what extent has prescribing impacted the following for you: Time spent with patient?		.824
PB7f	To what extent has prescribing impacted the following for you: Time spent assessing patients?		.818

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 5 iterations.

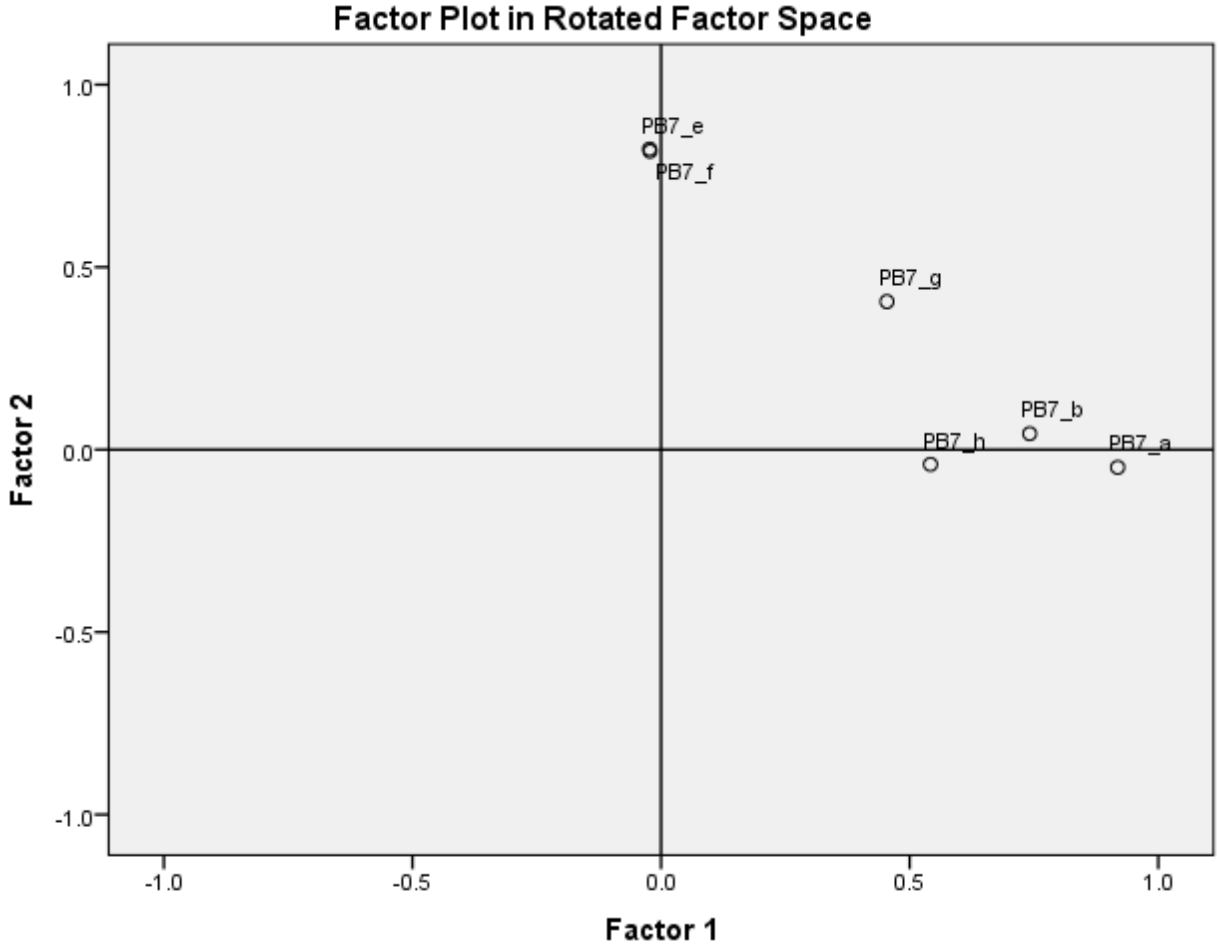


Factor Correlation Matrix

Factor	1	2
1	1.000	.394
2	.394	1.000

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.



First, we used principle component analysis without any rotation to identify composite scores for the underlying factors. First two factors only had Eigenvalue over one and these two factors explained variance of 49% and 22% respectively. The leveling of eigenvalues after two factors in the scree plot also suggested solution of two factors. Then we ran exploratory factor analysis with varimax and oblimin rotation. Correlation of 0.4 between two factors suggested choosing oblimin solution. Three items PB7 a, b, h were loaded in factor 1 with loading factor above 0.5 and two items- PB7 e and f were loaded in factor 2 with loading factor above 0.8. Items loaded in factor 1 explained the impact of prescribing on positive professionalism such as job satisfaction, professional image, quality of physician relationship. Items, loaded in factor 2, explained the impact on patient care for example time spent with patient or for patient assessment. Item PB7 g, explaining impact on quality of patient care, were loaded in both factor with loading factor above 0.4. Due to similarities of this item with impact on patient care we included this item in factor 2 (i.e. impact on patient care). We also tested the internal consistency of both factors using Cronbach's alpha. The alpha value of impact on positive professionalism and impact on patient care scale were 0.759 and 0.775 respectively suggesting higher reliability of the scales.

Support for prescribing adoption

Initially, we tested the factorability of nine items of questionnaire to measure support for prescribing adoption in the survey (i.e. Question PB6). All the items were correlated by at

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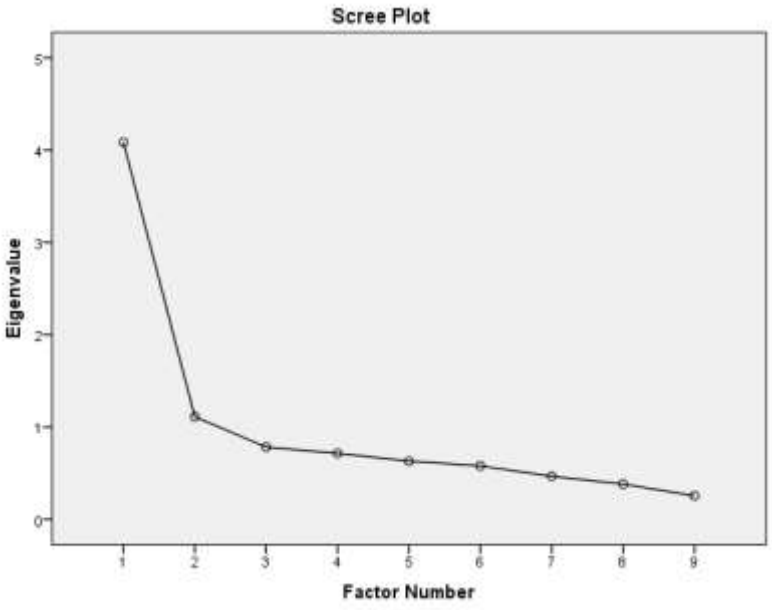
least 0.3 with at least one other item which suggests factorability of the items. Kaiser-Meyer-Olkin value of 0.850 confirms sample adequacy for factor analysis. Communalities of 0.3 or above suggest that each item shares common variance with other items. All the above mentioned indicators allowed us to run factor analysis with the nine items of question PB6.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.085	45.394	45.394	3.596	39.954	39.954	3.237
2	1.111	12.344	57.738	.727	8.074	48.028	2.755
3	.782	8.687	66.425				
4	.714	7.931	74.356				
5	.630	6.995	81.351				
6	.578	6.425	87.776				
7	.466	5.173	92.949				
8	.381	4.233	97.182				
9	.254	2.818	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.



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Pattern Matrix[a]

Item		Factor	
		1	2
PB6c	To what extent do the following factors affect your prescribing activities: My practice environment?	.797	
PB6a	To what extent do the following factors affect your prescribing activities: Pharmacy staffing at my practice location?	.690	
PB6b	To what extent do the following factors affect your prescribing activities: Access to patient information?	.688	
PB6i	To what extent do the following factors affect your prescribing activities: Employer's expectations?	.539	
PB6d	To what extent do the following factors affect your prescribing activities: Patient expectations?	.530	
PB6g	To what extent do the following factors affect your prescribing activities: My education and training?	.366	-.312
PB6h	To what extent do the following factors affect your prescribing activities: Requirement to document patient care?	.361	-.301
PB6e	To what extent do the following factors affect your prescribing activities: Relationships with physicians?		-.955
PB6f	To what extent do the following factors affect your prescribing activities: Relationships with other health care professionals?		-.751

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.[a]

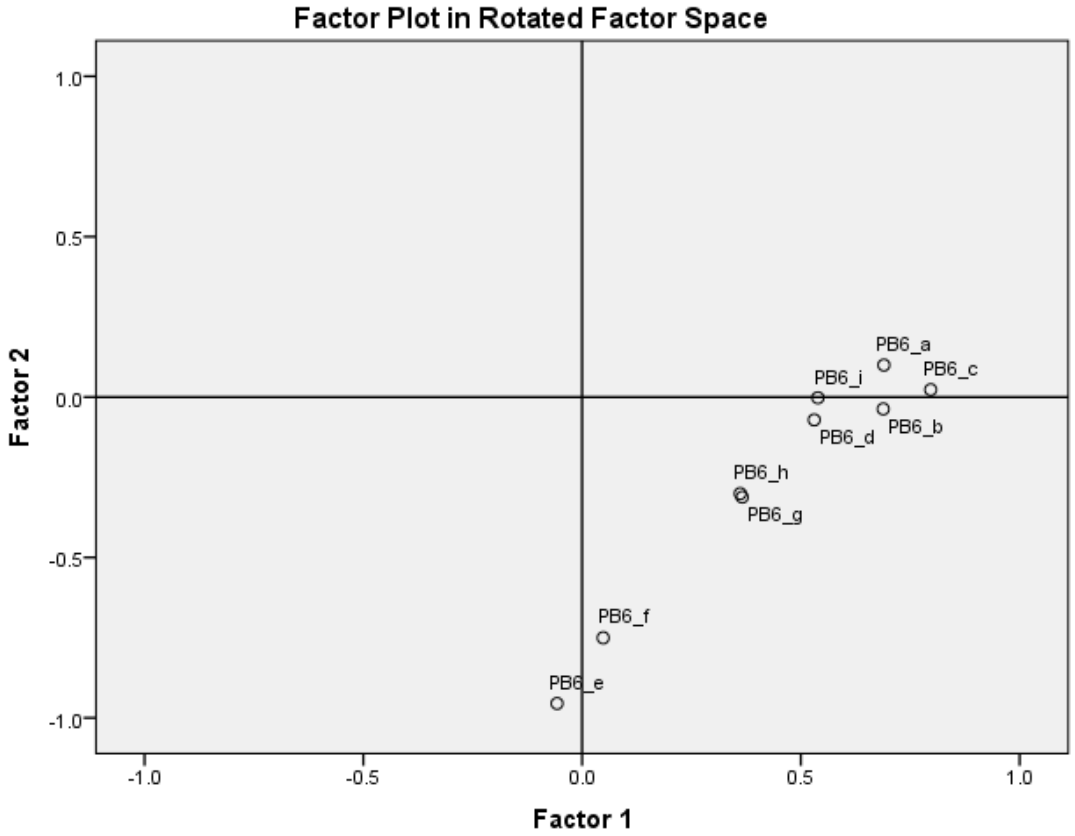
a. Rotation converged in 5 iterations.

Factor Correlation Matrix

Factor	1	2
1	1.000	-.595
2	-.595	1.000

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.



First, we used principle component analysis without any rotation to identify composite scores for the underlying factors. First two factors only had Eigenvalue over one and these two factors explained variance of 41% and 10% respectively. The leveling of eigenvalues after two factors in the scree plot also suggested solution of two factors. Then we ran exploratory factor analysis with varimax and oblimin rotation. Correlation of 0.6 between two factors suggested choosing oblimin solution. Five items – PB6 a, b, c, d, and i were loaded in factor 1 with loading factor above 0.53 and two items- PB6 e and f were loaded in factor 2 with loading factor above 0.7. Items PB6 a,b,c and i of factor 1 explained the support from practice environment such as access to patient information, staffing at practice location, employer's expectation, practice environment. Other item PB6 d of factor 1 explains patient expectation which we considered as part of support from practice environment as because patient expectation has a profound impact on the

practice environment. Items, loaded in factor 2, explained the support from relationship with healthcare professionals (HCPs). We eliminated PB6 g and h from the scales as these two items' loading factors were below 0.4 in both factors. We also tested the internal consistency of both factors using Cronbach's alpha. The alpha value support from practice environment scale and support from relationship with healthcare professionals scale were 0.78 and 0.851 respectively suggesting higher reliability of the scales.

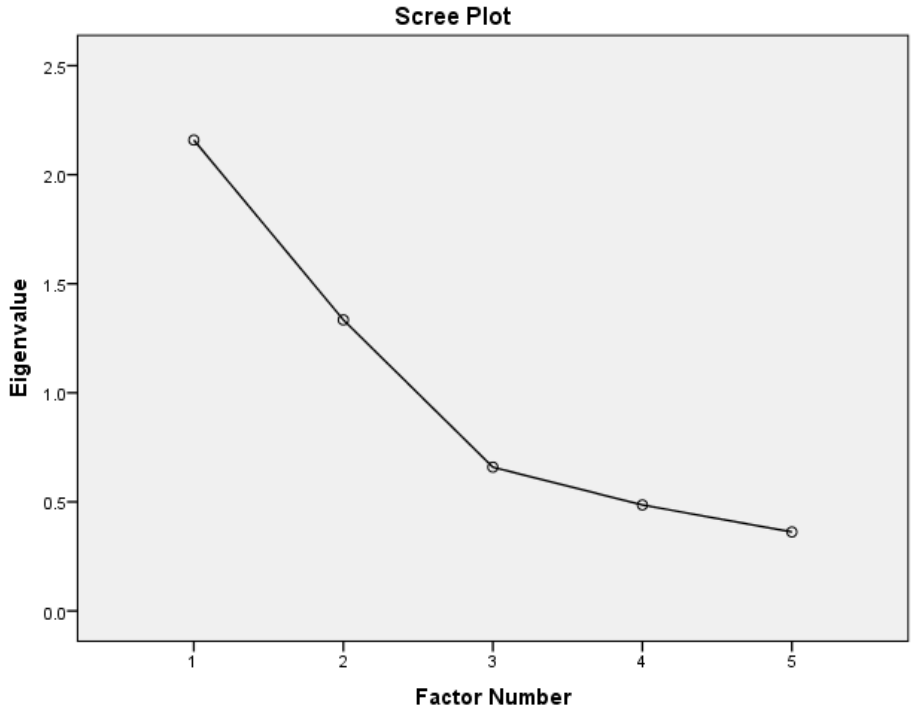
Use of Electronic Health Record (HER)-Netcare

We tested the factorability of five items of question GP8 to measure level of EHR use. All the items were correlated by at least 0.3 with at least one other item which suggests factorability of the items. Kaiser-Meyer-Olkin value of 0.668 confirms sample adequacy for factor analysis. Communalities above 0.6 suggest that each item shares common variance with other items. All the above mentioned indicators allowed us to run factor analysis with the five items of question GP8.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.159	43.178	43.178	1.746	34.930	34.930	1.729	34.581	34.581
2	1.334	26.687	69.865	.704	14.089	49.018	.722	14.438	49.018
3	.659	13.181	83.046						
4	.486	9.715	92.761						
5	.362	7.239	100.000						

Extraction Method: Principal Axis Factoring.



Rotated Factor Matrix[a]

Item		Factor 1	Factor 2
GP8e	In Netcare, I look up: - Medical history such as diagnostic tests and discharge or admission history	.848	
GP8d	In Netcare, I look up: - Lab values	.723	
GP8c	In Netcare, I look up: - Medication history/allergies/refills including Pharmaceutical Information Network	.694	
GP8b	In Netcare, I look up: - Double doctoring or multiple pharmacies		.655
GP8a	In Netcare, I look up: - Demographic information including personal health care numbers (number from Alberta Health card)		.522

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.[a]

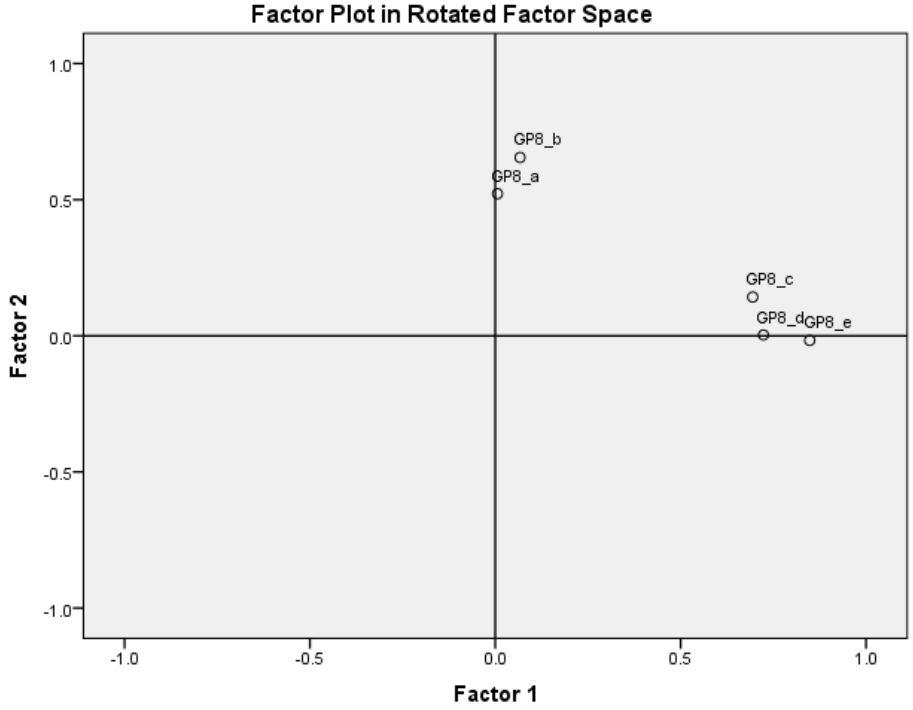
a. Rotation converged in 3 iterations.

Factor Transformation Matrix

Factor	1	2
1	.992	.129
2	-.129	.992

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.



First, we used principle component analysis without any rotation to identify composite scores for the underlying factors. First two factors only had Eigenvalue over one and these two factors explained variance of 43% and 27% respectively. The leveling of eigenvalues after two factors in the scree plot also suggested solution of two factors. Then we ran exploratory factor analysis with varimax and oblimin rotation. Correlation of 0.1 between two factors suggested choosing varimax solution. Three items – GP8 c, d, e were loaded in factor 1 with loading factor above 0.6 and two items- GP8 a and b were loaded in factor 2 with loading factor above 0.5. Items, loaded in factor 1, explained the EHR use for intense patient care such as checking patient history, lab values, and pharmaceutical information. Items of factor 2 explained the technical use of EHR for example demographic or doctor visit information. We also tested the internal consistency of both factors using Cronbach's alpha. The alpha value of the EHR use for intense patient care scale was 0.8 suggesting higher reliability of the scales. The alpha value of technical use of EHR scale was 0.512.

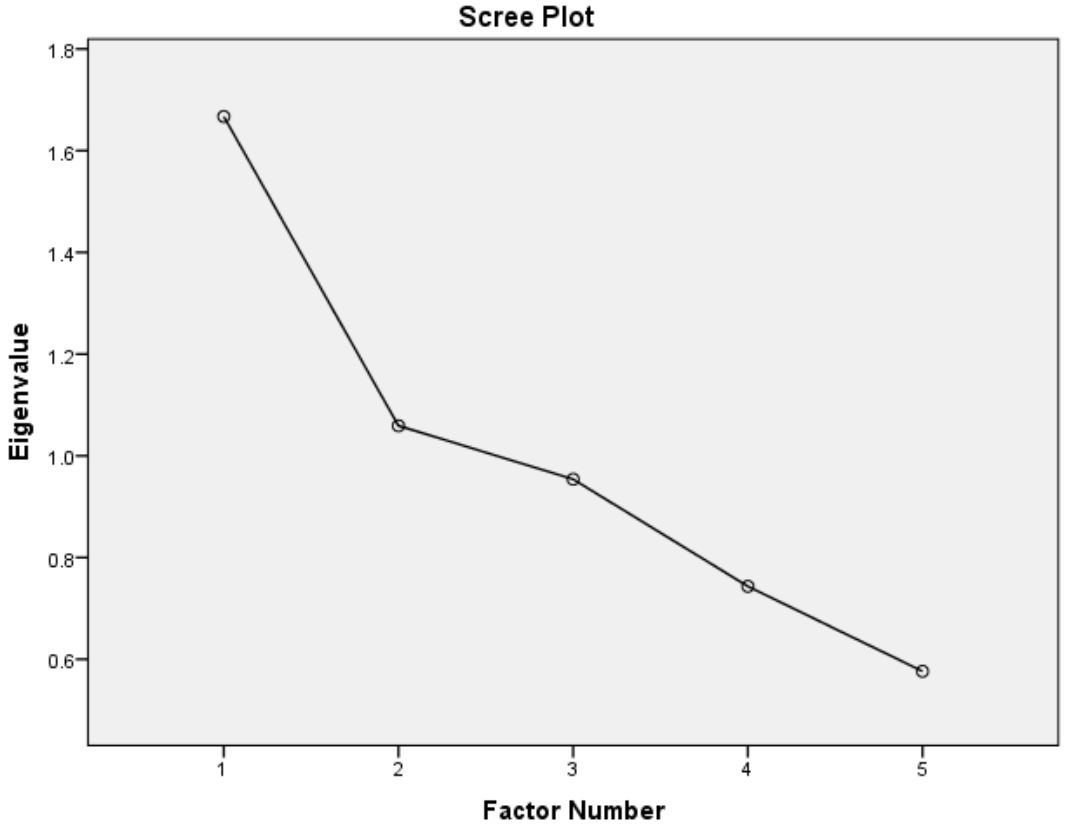
Prescribing belief

Initially we tested the factorability of five items of question PP1 to prescribing belief. All the items, except PP1 a and c, were correlated by at least 0.3 with at least one other item which suggests factorability of the items. Kaiser-Meyer-Olkin value of 0.606 confirms sample adequacy for factor analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.667	33.344	33.344	1.039	20.784	20.784	1.034	20.679	20.679
2	1.059	21.182	54.527	.194	3.883	24.667	.199	3.988	24.667
3	.954	19.079	73.606						
4	.743	14.868	88.473						
5	.576	11.527	100.000						

Extraction Method: Principal Axis Factoring.



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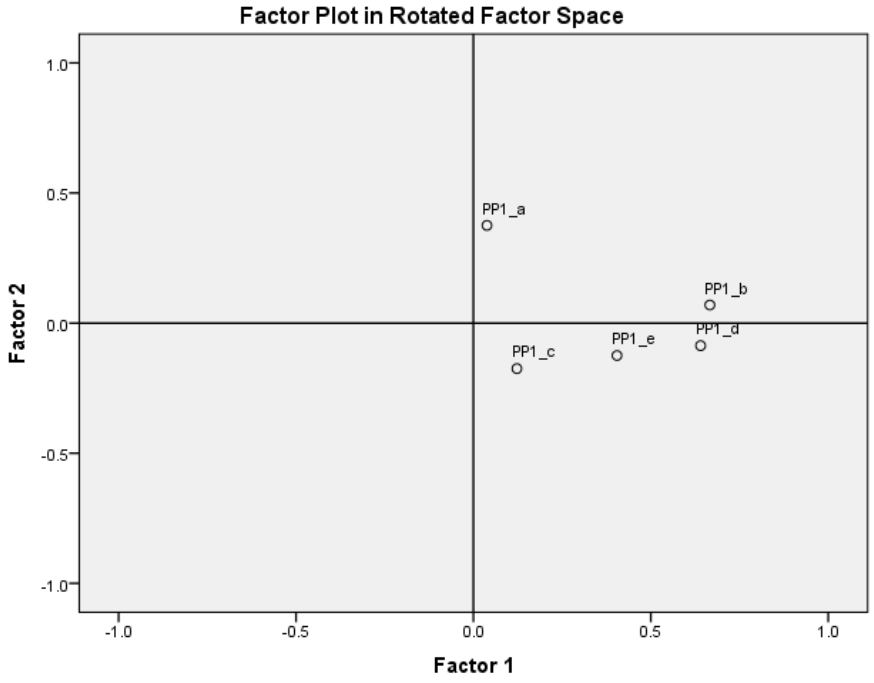
Rotated Factor Matrix[a]

Item		Factor 1	Factor 2
PP1b	Patients are responsible for ensuring they have a sufficient supply of medications?	.666	
PP1d	Pharmacist prescribing increases pharmacists' professional liability?	.640	
PP1e	Pharmacists should only extend refills once?	.405	
PP1a	Pharmacist prescribing is an extension of the role that pharmacists already fulfill?		.375
PP1c	Pharmacist prescribing helps patients avoid physician follow-up?		

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.



Factor Transformation Matrix

Factor	1	2
1	.997	-.079
2	.079	.997

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

First, we used principle component analysis without any rotation to identify composite scores for the underlying factors. First two factors only had Eigenvalue over one and these two factors explained variance of 33% and 21% respectively. The leveling of eigenvalues after two factors in the scree plot also suggested solution of two factors. Then we ran exploratory factor analysis with varimax and oblimin rotation. Correlation of 0.1 between two factors suggested choosing varimax solution. Three items – PP1 b, d, e were loaded in factor 1 with loading factor above 0.4. Two items PP1a and c were eliminated as they did not load above 0.4 in any factor. Items loaded in factor 1 explained the prescribing belief of pharmacist. We also tested the internal consistency of the factor using Cronbach's alpha. The alpha value of the prescribing belief was 0.583.