



Assessment of community pharmacists' perceived barriers and disadvantages in providing health promotion services in Jos, Nigeria

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ABSTRACT

The study's objective was to assess Community Pharmacists' perceived barriers and disadvantages in providing health promotion services in Jos, Nigeria. The study was conducted among consenting Community Pharmacists in Jos Metropolis with the aid of a pretested structured questionnaire. It was a descriptive cross sectional survey of 70 Community Pharmacists out of 78 registered as at the time of sampling. Data was collated and analysed using the Epi-Info™ Version 7.1.4 and SPSS Version 16. Descriptive statistics of the participants was done using Means, and Percentages. Chi-square test of goodness of fit was used to determine if there was a specific pattern in the observed responses of the study participants and if this differed significantly from the expected responses of a standardized population. Logistic regression test was used to determine whether baseline characteristics of study participants had any predictive value on participants' perceptions of disadvantages and barriers. The mean age of the participants was 39 years and most of the study group was within the age group of 31-40 years. The following were the barriers identified in this study: not enough time, lack of standard practice guidelines, ownership of premises by non-pharmacists, insufficient management support, poor perception of their roles by the community and low profitability. Disadvantages according to this study are: need for continuous training of Community Pharmacists in health promotion services and need to hire more staff. The findings of this study identified a number of organizational barriers and disadvantages that may limit the involvement of the Community Pharmacists in health promotion services. This suggests that in the development of future Public Health programs in Nigeria, efforts must be made to overcome these barriers and disadvantages by employing adequate policies and tools in order to optimize the Community Pharmacists' contributions towards improving public health indices.

Key Words: Community Pharmacists, Health Promotion Services, Barriers to Health Promotion Services, Disadvantages of Health Promotion Services, Pharmacy Profession.

INTRODUCTION

Health promotion has been defined as the process of enabling people increase control over the determinants of their health and thus, improve it [1]. It involves both individual and community level interventions which seek to facilitate behavioural and environmental changes that improve Public health. Health promotion interventions encompass the core functions of Public health; assessing and monitoring populations to identify health problems, formulating public policies aimed at protecting health and ensuring easy access to cost-effective and quality healthcare [2].

Globally, there is an increasing recognition of the importance of extending Public health principles to all health professionals; especially with the increasing burden of chronic diseases, health disparities, decreased access to healthcare and increasing healthcare costs [3]. Health promotion and disease prevention strategies such as discouragement of smoking, alcohol abuse, weight management and physical activity are necessary to decrease personal and societal consequences as well as improve overall quality of life [4]. Such self-care and disease prevention activities can be vital tools in the improvement of overall Public health. The Pharmacy profession has expanded its roles to include the provision of health promotion

services. Community Pharmacists are being identified as useful resources for providing health promotion services and improving overall Public health [5-6]. They are credible sources of information on how to improve health and prevent disease, contributing as much as 80% of the health services provided in many settings [7]. This high frequency of patronage can be due to good access to their services; no appointments needed, long opening hours and convenient / almost no waiting time. They are also conveniently situated within the community [8]. As primary care providers, they serve as an informed link between the patient and the healthcare system. They are knowledgeable resources who can encourage the adoption and maintenance of healthy lifestyle behaviours, as well as identify and manage various disease conditions [9].

However, the body of evidence regarding their role in health promotion services is found to be limited and they are generally perceived to be an under-utilised resource [8, 10-11]. While much has been written about the strengths of Community Pharmacists as ideal sources for the provision of health promotion services, the challenge is demonstrating concrete outcomes from these potential advantages [12]. Studies have also shown that there is often a gap between what should be Community Pharmacists' "ideal" involvement and actual involvement in public health activities [5]. This gap indicates a need to look into factors that may limit their role in this field of healthcare practice. Barriers and disadvantages to providing health promotion services should be explored in order to fully understand and place the Community Pharmacist's role in the broader health promotion context [7]. A systematic review of the Pharmacists' views regarding their roles in Public health found that although they perceived Public health services as part of their functions; there were various barriers and limiting factors that influenced their involvement in providing these services [5].

To date, little information has been gathered as to the Community Pharmacists' perceptions of their role in health promotion and disease prevention [2, 10, 13]. This includes data on factors that may limit their involvement such as barriers and disadvantages. Such data is valuable in the development of Public health programs and policies which will ultimately maximise the potentials of Community Pharmacists' and facilitate their involvement in health promotion activities. The need for such studies is imperative as Primary health care remains the central focus of a nation's health policy. Current global trends in the Pharmacy profession are geared towards pharmaceutical care philosophy; these can

strengthen the health system and ensure that Public health indices improve. Health promotion services provided by Community Pharmacists will contribute immensely to achieving this end. Our study was aimed at assessing the perceived disadvantages and barriers towards the provision of health promotion services by Community Pharmacists in our setting.

METHODS

Settings: Plateau state is one of the 36 states in Nigeria. It is in the North-central region of Nigeria and its capital, Jos, comprises mainly three of the 17 local government areas in the state with a population of about 836,910 according to the 2006 census report of the National Population Commission (NPC) [14]. Inhabitants of Jos metropolis are from different backgrounds and different social strata. Most of the significant economic activities in the State take place here. Health care facilities in Jos include three tertiary hospitals, over 100 private hospitals and clinics, several Primary Health Centers, Patent Medicine Stores, and Traditional Medicine Clinics. The study sites are: Community Pharmacies in the Metropolis.

Study Design: The study was a descriptive cross sectional survey of the registered Community Pharmacists in Jos Metropolis, Nigeria.

Inclusion & Exclusion Criteria: All Community Pharmacists visited and gave consent to take part in survey were included in the study while those who declined to give their consent were excluded from the study.

Sampling: The whole population of the community pharmacies in the metropolis were selected as participants in the study.

Ethical Clearance: Approval for carrying out the study was obtained from Research and Ethics Committee of Jos University Teaching Hospital, Jos.

Sample size: The study population comprised all registered community pharmacists in Jos metropolis. A directory of the Community Pharmacies obtained from the state Ministry of Health indicated there were up to 78 registered Pharmacy premises as at the time of this study. A total of 70 registered Community Pharmacists were given the questionnaires. All were included in the study and the unit of study was the Community Pharmacist.

Data Collection Instrument: Data was collected using a self-administered pre-tested questionnaire. The survey instrument used was adapted from a validated tool used in a study on Health promotion among Community Pharmacists in South East, Nigeria by Oparah and Okojie [8]. Section A of the questionnaire focused on demographic/baseline characteristics of the respondents (i.e. gender, age, highest qualification acquired, current employment status, years of post-qualification experience and any additional qualifications), and the characteristics of each Community Pharmacy (i.e. number of Pharmacists and number of support staff in each of the premises).

Section B focused on perceived disadvantages and barriers in the provision of Health promotion services by Community Pharmacists. Respondents were asked to indicate the extent to which they agreed or disagreed to the statements posed using a 5-point Likert-type scale thus: strongly agree=5, agree=4, not sure=3, disagree=2, and strongly disagree=1.

This section was designed following item generation from literature review and discussion sessions between the authors and five Community Pharmacists who were not part of the study population. Face and Content validity was assured following interaction and feedback sessions with experienced Pharmacists with specific interests in Health promotion. A Pilot survey ensured readability, easy comprehension and relevance to the study area. Institutional review board approval was obtained before the onset of the study.

Data Analysis: The Primary outcomes of this study were perceived barriers and disadvantages in the provision of health promotion services by Community Pharmacists. Data was collated and analysed using the Epi-Info™ Version 7.1.4 and SPSS Version 16. Descriptive statistics of the participants was done using Means, and Percentages. Chi-square test of goodness of fit was used to determine if there was a specific pattern in the observed responses of the study participants and if this differed significantly from the expected responses of a standardized population. Logistic regression test was used to determine whether baseline characteristics of study participants had any predictive value on participants' perceptions of disadvantages and barriers.

RESULTS

Sixty-three (63) out of the 70 questionnaires administered were returned; a response rate of 90% was achieved.

Forty out of 63 study participants (63.5%) were male while the remaining 23 (36.5%) were female. The mean age of the study participants was 39 years with 25 (40.3%) belonging to the age group 31-40 years. Most (52 out of 63; i.e. 82%) of the study participants had a Bachelor of Pharmacy degree (B. Pharm) with no other qualification. Most (41 out of 63; 65%) of the study participants had between 1-10 years of Community Pharmacy practice experience and about half (32 out of 63; i.e. 51%) were employed as Superintendent Pharmacists. The mean number of Pharmacists per premise was two and the mean number of support staff per premise was five.

The distribution of participants' responses to each of the itemised disadvantages of Health Promotion services by Community Pharmacists is shown in Table 1. The mean score for participant's responses and the residuals (i.e. how the observed number of study participants per level of agreement differed from the expected values of a standardised population) are also shown in Table 1. The mean score and the overall residuals also depict the pattern of the responses; whether towards agreeing or disagreeing with the itemised disadvantage. Mean scores of 1.0-3.0 were classified as disagreeing with the stated item, while 3.1-5.0 were classified as agreeing with the stated item. Chi-square test of goodness of fit indicated if there was a significant difference between the observed and expected responses for each itemised disadvantage. A similar distribution of participants' responses to itemised barriers in the provision of Health Promotion services by Community Pharmacists is shown in Table 2. Each of the itemised disadvantages (i.e. the need to hire more staff, continuous training of staff, HPS being a duplication of Family doctor's role, customer's reluctance/apathy to HPS and profit realised from HPS not worth the time) and the baseline characteristics of the study participants (i.e. current employment status, highest educational qualification, participants age in years, gender, years of practice as a Pharmacist, number of Pharmacists and support staff in each Community Pharmacy.), were included in predictive models using the Logistic regression test. Only the number of Community Pharmacists in each premise was predictive of participants' perception of continuous training being a disadvantage of HPS by Community Pharmacists. For each unit increase in the number of Pharmacists per premises, the Odds of the study participants agreeing to this being a disadvantage of providing HPS increased by four fold. Details of this are shown in Table 3.

DISCUSSION

There has been increasing recognition of the significant roles Community Pharmacists play in improving Public health indices through their daily activities. Health promotion and disease prevention services can be used to increase access to quality healthcare, decrease health disparities and improve overall Public health. It is therefore imperative that Community Pharmacists are integrated as part of the health workforce providing these vital services. The Community Pharmacists' perception of barriers and disadvantages that may limit their involvement in providing health promotion services can be useful indicators of their willingness to include health promotion as part of daily practices. These were explored in this study.

The mean age for all study participants was 39 years and most of the study participants (40.3%) were of the age group 31-40 years. This is similar to findings from similar studies carried out in Benin and Warri Cities, South-South Nigeria where almost half (47.8%) of the respondents were aged 30 -39 years; as well as a study in Penang, Malaysia where a large proportion (40%) of participants were aged between 31 and 40 years [2, 8]. The predominant age group in this study may be a reflection of the growing interest of young-middle age Pharmacists in Community Practice. This may be due to the independence, entrepreneurial opportunities and service-oriented environment Community Practice provides. Community Pharmacy practice has also been reported to be rewarding, with several opportunities to provide innovative and expansive patient care services [15].

Most of the study participants were male, and this interestingly differs from trends found in literature where females are the majority in the profession of Pharmacy as a whole. However, one study demonstrated that because of their peculiarities, women were less likely to work full-time and this may negatively affect their willingness to own and operate their own stores, serve in managerial roles or lead change within the profession [16]. Findings from a study carried out in the United Kingdom (UK) showed that although women made up a large proportion of the Pharmaceutical workforce, there were certain structural and environmental features peculiar to Community Pharmacy practice that discouraged their participation and uptake of certain roles within the practice. These include lack of family friendly working conditions, anti-social working hours and the need to be constantly present at the Pharmacy [17]. These features were not explored in this present study. However, the higher proportion of males in this study may be a

reflection of their preference for the entrepreneurial opportunities which Community Pharmacy practice offers as observed by Janzen *et al.*, [18].

Most of the study participants (82%) possessed only the B. Pharm degree with no additional qualification. The general perception of the Community Pharmacists in this study may have been that the B. Pharm training equipped them with the basic knowledge and skills required to be involved in Community Pharmacy practice.

About half of the study participants (51%) were Superintendent Pharmacists suggesting that a significant proportion of Community Pharmacists practicing in Jos metropolis acted in this capacity. This is not surprising as regulations require that every Community Pharmacy premise should be registered by a Pharmacist who subsequently acts as the Superintendent Pharmacist of such premises. The overall pattern of responses showed that the study participants agreed that not enough time, a lack of standard practice guidelines, ownership of premises by non-Pharmacists, insufficient management support, poor community perceptions of their roles and low profitability were barriers to providing health promotion services to the public. As was observed for this study, other studies have also shown that lack of time was a barrier to the provision of health promotion services by Community Pharmacists [2, 5, 12-13, 19].

Minimal waiting time has been cited as one of the reasons for the high patronage of Community Pharmacists as compared to other Primary healthcare workers [8]. Hence it is easy to see why Community Pharmacists will not want to increase the time spent for each client. Training auxiliary staffs to carry out other tasks has been proposed as a measure which will free time for the Community Pharmacist to perform his / her Public health role. However, one study in the Southern region of Nigeria observed that Pharmacists were unwilling to use technicians in order to free up time for patient interaction, believing they could perform both functions [8]. Pharmacists in this study may have shared similar sentiments but further studies in this regard will be required.

A lack of standard practice guidelines has also been identified as a barrier in a similar study carried out in Penang, Malaysia [2]. Oparah and Okojie [8] also highlighted the need for a health promotion policy and legislation that will enable Community Pharmacists to be actively involved in health promotion. This suggests that Community Pharmacists in this study area and perhaps in many developing countries do not have a standard guideline to follow in the provision of health

promotion services. Without standard guidelines, Community Pharmacists are left to devise their own methods of Health promotion services which may largely depend on their skills, knowledge and the demand for certain services in the particular community they operate. Standard practice guidelines may be a motivating factor towards encouraging greater involvement as it can further consolidate health promotion as part of the Pharmacist's professional duty.

Ownership of premises by non-Pharmacists and insufficient management support were also identified as important barriers to the provision of Health promotion services in a study conducted in Benin and Warri cities, South-south, Nigeria [20]. This may arise from a poor understanding by non-Pharmacists of the importance of health promotion to the business. They may see it as a waste of time especially if there appears to be no clear link with the realisation of financial profit. Pharmacists may need to take out time to explain to non-Pharmacists (who own or manage Community Pharmacies); the merits of health promotion services to the business and towards Public health. Certain health promotion services may lead to enhanced sales of related goods, for instance advice on safe sexual practices may lead to better sales of condoms and other related products. Issues related to Management/ Pharmacy owner's support may also vary from setting to setting. For instance, in a study which was conducted in Indiana, USA; insufficient management's support was not found to be an important barrier [19].

Community perception was considered as a barrier to the provision of health promotion services in this study. A systematic review of literature found that most clients considered the Community Pharmacist as the appropriate source of Public health advice but had mixed views on their ability to do this. Satisfaction was also found to be high in those who received pharmaceutical Public health services [5]. An initiative to address this was carried out in England. The aim was to equip Community Pharmacists to provide advice on certain health promotion topics. It was observed that health promotion services were well received by clients who used them, many of whom had not previously sought such services from a Pharmacist [12]. Hence, despite the perception of respondents in this study, community perceptions of their roles and services can be influenced positively if they improve their competence in health promotion services and proactively offer same to community members.

Although participants agreed that insufficient remuneration was a barrier to providing health

promotion services, the pattern observed suggests that remuneration or profitability is not a disadvantage (i.e. an inherent adverse outcome) of health promotion services by Community Pharmacist. They may have thought of certain health promotion services as part of their professional duties and services (e.g. counseling on how to use medications, lifestyle counseling etc.) and as such did not require "special fees" for them. This finding is similar to the results of a study in Penang, Malaysia, where lack of reimbursement or lack of profitability was not found to be major barriers of providing health promotion services. However, it slightly differs from results of similar studies conducted in the USA and Canada, where it represented a key barrier to the provision of health promotion services [6, 19]. Joyce *et al.*, [6] also found that incentive payments were key criteria in the effectiveness of certain health promotion services and Community Pharmacists wanted to be compensated for the in-store advice and other health promoting services they and their employees offered to the community.

The overall pattern in the study participants' responses showed they disagreed that insufficient training, insufficient knowledge/skills, intrusiveness on public's privacy and poor support from professional associations were barriers to providing health promotion services. It may be inferred from this pattern that those factors that were more likely to be directly influenced by the Community Pharmacists themselves were thought to be less of a barrier than others, i.e. they could acquire requisite knowledge/skills on their own and perhaps perceived that their professional associations were supportive in providing continuous training and support. The study participants may have also considered that the knowledge, skills and training they currently possessed to be adequate for the provision of health promotion services. This is consistent with studies which have shown that Community Pharmacists were competent in chronic disease management, counseling to promote health and providing valuable health education to the public [21-22, 19]. Knowledge and skill however are important elements in effective health promotion delivery and Community Pharmacists will need retraining in key areas to ensure they remain active participants in the provision of health promotion services as indicated by study carried out in Benin and Warri cities, South-south Nigeria [8].

Respondents disagreed that health promotion services were intrusive on the public's privacy and this differs from results of previous research which has shown health promotion services by Community Pharmacists to be reactive rather than

proactive. Possible reasons for this include the concern that offering “unsolicited advice” may be unwelcome and seen as interfering in people’s lives.

The overall trend of opinion by the study participants regarding perceived disadvantages of providing health promotion services showed they disagreed that their services were a duplication of Family Doctors’ roles. Community Pharmacists are patronised by both sick and healthy people and are a good source of information and services that address the risk to diseases and encourage protective health behaviours [6]. Thus, even before disease and illness become evident and require a visit to the doctor, the Community Pharmacist can help promote health and prevent disease; a vital function towards improving the Public health of communities. These observations may have influenced the study participants’ perception of their role in health promotion as being important, unique and distinct from that of other health professionals including the Family Doctor.

Concerning the need for continuous training of Community Pharmacists in Health promotions services, the overall pattern of opinions in this study suggests that this is perceived as a disadvantage in the provision of Health Promotion services. Hassali *et al.* [2] had similar findings amongst Community Pharmacists in Malaysia where screening for cardiovascular diseases and assessment of non-compliance to therapy were considered to be services which required the Pharmacists to continually update his/her knowledge. A study in the UK also found that most Pharmacist-led health promotion programs involved counseling and advice. These are skills that focus on behaviour change and require additional and continuous training [12].

The need for continuous training suggests Community Pharmacists need to acquire knowledge and skills required for the expansion of their role and the provision of new services in response to changing trends in Public Health [23]. This requires effort and discipline if one must be effective in the provision of Health Promotion services. It is no surprise that the overall pattern of

responses in this study indicated that this was a disadvantage associated with the provision of health promotion services.

Respondents also agreed the need to hire more staff was a disadvantage to providing HPS. This may be related to having an adequate number of Community Pharmacists in order to appropriately participate in public health activities, including health promotion services. A lack of adequate staff was cited as a factor hindering Community Pharmacists from being involved in health promotion by more than half of respondents in a study conducted in Canada [13]. The number of Pharmacists per premise was predictive of continuous training being a disadvantage of providing HPS. This may suggest that with more Pharmacists at the premise, there is a need to adequately train and equip them with the knowledge, skills and competencies required to provide these services. Employers may be reluctant to do so because of the costs attached to training and possible remunerations attached to their services.

The impacts of this study are: that previous studies that showed that Community Pharmacists are competent in chronic disease management and counseling to promote health and provide valuable health education to the public were confirmed and in addition the need for the development of standard guidelines or policy document on health promotion services in developing countries like Nigeria was also confirmed.

CONCLUSION

The findings of this study identify a number of organizational barriers and disadvantages that may limit the involvement of the Community Pharmacists in health promotion services. This suggests that in the development of future Public Health programs in Community Pharmacy, efforts must be made to overcome these barriers and disadvantages by employing adequate policies and tools in order to optimize the Community Pharmacists’ contribution towards improving public health indices.

Table 1: Chi-square test for goodness of fit of participants' responses itemized disadvantages of Health Promotion Services (HPS).

Responses of participants	Observed value for A (Residual)	Observed value for B (Residual)	Observed value for C (Residual)	Observed value for D (Residual)	Observed value for E (Residual)
Mean scores	3.4	3.9	2.5	3.1	2.7
Strongly disagree	3 (-9.6)	5 (-7.6)	11(-1.6)	7 (-5.6)	9 (-3.6)
Disagree	15 (2.4)	8 (-4.6)	26 (13.4)	15 (2.4)	26 (13.4)
Neutral	9 (-3.6)	2 (-10.6)	14 (1.4)	14 (1.4)	9 (-3.6)
Agree	23 (10.4)	24 (11.4)	7 (-5.6)	16 (3.4)	12 (-0.6)
Strongly Agree	13 (0.4)	24 (11.4)	5 (-7.6)	11 (-1.6)	7(-5.6)
Total Observed N	63	63	63	63	63
Expected Value	12.6	12.6	12.6	12.6	12.6
Chi-Square	17.397	35.810	21.683	4.222	18.825
Df	4	4	4	4	4
Asymp. Sig.	0.002	<0.001	<0.001	0.377	0.001

Key: A-The need to hire more staff, B-Continuous training is required, C-Duplication of Family Doctors' roles, D-Customers reluctance / apathy E-Profit realized not worth the time

Annotated disagreement with itemised disadvantage HPS. These were statistically significant $\alpha = 0.05$

C-Overall residual show participants disagree their involvement in HPS was a duplication of Family Doctors.

E-Overall residual show participants disagree with low profits being a disadvantage in HPS

Annotated agreement with itemised disadvantages HPS. These were statistically significant $\alpha = 0.05$

A-Overall residual show participants agree that the need to hire more staff is a disadvantage in HPS.

B- Overall residual show participants agree that continuous training is a disadvantage in HPS.

Table 2: Chi-square test for goodness of fit of participants' responses to itemised Barriers to Health Promotion Services (HPS).

Extent of agreement / disagreement	Observed of N ^A (Residual)	Observed N ^B (Residual)	Observed N ^C (Residual)	Observed N ^D (Residual)	Observed N ^E (Residual)	Observed N ^F (Residual)	Observed N ^G (Residual)	Observed N ^H (Residual)	Observed N ^I (Residual)	Observed N ^J (Residual)
Mean scores	3.2	3.3	2.3	3.5	3.5	3.3	3.0	3.1	2.3	2.9
S. Disagree	2 (-8.5)	3 (-9.6)	19 (6.4)	5 (-7.6)	3 (-9.6)	1 (-9.5)	8 (-2.5)	6 (-4.5)	14 (1.4)	8 (-2.5)
Disagree	24 (13.5)	20 (7.4)	20 (7.4)	13 (0.4)	12 (-0.6)	18 (7.5)	17 (6.5)	13 (2.5)	27 (14.4)	21 (10.5)
Neutral	4 (-6.5)	8 (-4.6)	11 (-1.6)	10 (-2.6)	9 (-3.6)	11 (0.5)	7 (-3.5)	11 (0.5)	11 (-1.6)	7 (-3.5)
Agree	19 (8.5)	20 (7.4)	11 (-1.6)	15 (2.4)	29 (16.4)	24 (13.5)	18 (7.5)	21 (10.5)	9 (-3.6)	17 (6.5)
S. Agree	13 (2.5)	12 (-0.6)	2 (-10.6)	20 (7.4)	10 (-2.6)	8 (-2.5)	11 (0.5)	9 (-1.5)	2 (-10.6)	9 (-1.5)
Expected N	10.5	12.6	12.6	12.6	12.6	10.5	10.5	10.5	12.6	10.5
Total	63	63	63	63	63	63	63	63	63	63
Chi-Square	44.333	17.714	16.921	9.937	30.254	40.524	18.048	18.619	26.762	25.095
df	4	4	4	4	4	4	4	4	4	4
Asymp. Sig.	<0.001	0.001	0.002	0.042	<0.001	<0.001	0.003	0.002	<0.001	<0.001

Key: S-strongly, N-Number A-Not enough time, B-Insufficient remuneration, C-Not trained to provide HPS, D-Ownership of premises by non-Pharmacists, E-No standard practice guidelines, F-

Insufficient management support, **G**-Professional association not giving support, **H**-Community perceptions, **I**-Such services are considered intrusive, **J**-Insufficient knowledge of HPS.

Annotated disagreement with itemised barriers to HPS. These were statistically significant $\alpha = 0.05$

C-Overall residuals shows participants disagree with lack of training being a barrier to HPS

G-Overall residuals shows participants disagree with poor support from professional association being a barrier

I- Overall residuals shows show participants disagree that HPS are considered intrusive

J-Overall residuals shows show participants disagree that insufficient knowledge is a barrier to HPS

Annotated agreement with itemised barriers to HPS. These were statistically significant $\alpha = 0.05$

A-Overall residuals show participants agree with insufficient time being a barrier to HPS

B-An almost even distribution of residuals on profitability being a barrier but overall trend tilts in favour of agreeing

D-Overall residuals show participants agree with ownership of premises being a barrier to HPS

E-Overall residuals show participants agree with no standard practice guideline being a barrier

F-Overall residuals show participants agree with no management support being a barrier

H-Overall residuals show participants agree that poor community perception being a barrier

Table 3: Logistic Regression of grouped responses to continuous training being a disadvantage of HPS (i.e. agree / disagree) and baseline characteristics of the study participants

Unconditional Logistic Regression							
Term	Odds Ratio	95% C.I.	Coefficient	S. E.	Z-Statistic	P-Value	
Highest Educ Qualification (M.Sc./B. Pharm)	147186.97	<0.001 >1.0E12	11.90	379.13	0.03	0.98	
Highest Educ Qualification (Other Postgraduate Certification/B.Pharm)	0.05	0.002 1.28	-3.01	1.66	-1.81	0.07	
Highest Educ Qualification (PhD/B.Pharm)	0.13	0.01 3.23	-2.07	1.65	-1.25	0.21	
Highest Edu qualification (WAPCP/B.Pharm)	0.02	<0.01 2.26	-4.10	2.51	-1.64	0.10	
Participants Age in years	0.93	0.76 1.15	-0.07	0.11	-0.66	0.51	
Years of practice as a Pharmacist	1.07	0.89 1.30	0.07	0.10	0.74	0.46	
No of Pharmacists in each premises	<u>4.94</u>	<u>1.50</u> <u>16.25</u>	1.60	0.61	2.63	<u>0.009</u>	
No of support staff in each premises	0.90	0.71 1.12	-0.11	0.11	-1.00	0.32	
CONSTANT	*	* *	1.73	3.47	0.50	0.62	

Convergence: Converged

Iterations: 13

Final -2*Log-Likelihood: 46.6510

Cases included: 62

Test	Statistic	D.F.	P-Value
Score	18.1474	8	0.0201
Likelihood Ratio	19.5847	8	0.0120

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