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Factors influencing the uptake of the revised expanded immunisation programme at Umlazi Township, KwaZulu-Natal Province, South Africa

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Abstract

The Expanded Programme on Immunisation (EPI) is one of the most powerful and cost-effective global public health programmes to improve child survival. In South Africa, the programme remained fragmented because of the system of apartheid until 1995 when the national EPI was formed through the unification of all immunisation services in the country. Since then there have been significant advances in immunisation service delivery in South Africa with numerous revisions in the schedule, last of which was in 2009. The data information system for eThekweni district reflects remarkably low immunisation coverage for children aged 6 to 12 years compared to the other age groups from the time the 2009 revision was made. The aim of the study was to investigate the factors that influence the uptake of the revised EPI for children between the ages of 6 to 12 years at Umlazi Township, KwaZulu-Natal (KZN). A descriptive quantitative design was used to conduct the study. All (n=10) primary health care (PHC) clinics from Umlazi Township were included in the study. Data was collected from 1009 child caregivers (CCGs) and all (n=12) health care workers (HCWs) who were involved in EPI services using self-directed questionnaires. The study revealed that although the EPI programme was well-implemented in Umlazi Township, EPI coverage for children between 6 to 12 years old remained low. Several factors that influenced the uptake of the immunisations were identified. The positive factors which could be used to strengthen the programme were mainly in relation to how the EPI programme was implemented and a few other factors in relation to the CCGs and their access to the PHC clinics. The negative factors were in relation to emergency ordering and supply of vaccines and the knowledge of the children care givers regarding the immunisation. These highlighted a need to strengthen how the EPI was implemented.

Keywords: Child care givers, expanded programme on immunisation, immunisation coverage, immunisation uptake.

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Introduction

The EPI was established in 1974 by the World Health Organization (WHO) in order to provide a set of life-saving vaccines to the children of the world (WHO, 1974). Since then, much has been achieved with vaccines playing a major role in

controlling infectious diseases, especially among children, throughout the world. Several global health initiatives have been established to promote immunisation within the context of the other PHC interventions. The Global Alliance for Vaccines and Immunisation was established in 2000 to provide financial support for immunisation to the poorest countries of the world (WHO, 2000) and with the sole purpose of improving child care in the poorest countries by extending the reach of the EPI to these communities (Hajjeh, 2011). The Global Immunisation Vision and Strategy was established in 2005 with the specific aim of reducing vaccine preventable diseases and reducing mortality and morbidity rates by 2/3 by 2015 as compared to 2000 (WHO, 2005). Unfortunately, the toll from infectious diseases, much of which is vaccine preventable, remains high.

The EPI, a powerful and cost-effective public health programme for the improvement of child survival, was introduced in South Africa in 1974 (Wiysonge et al., 2012). The EPI was introduced in response to pandemic diseases like polio, measles, chicken pox, whooping cough, diphtheria and tetanus. These immunisations protect children from contracting diseases thus reducing the morbidity and mortality rate. According to Ngcobo (2008), the EPI was further strengthened by the WHO and UNICEF by introducing the Reach Every District and Reach Every Child strategies aiming to reach every child especially in the hard to reach geographical areas.

EPI is revised from time to time as determined by the needs and/or the successes of the programme, influenced by the prevalence and incidence of infectious and communicable diseases. The latest revision of the EPI in South Africa was conducted in 2009 (Department of Health, 2010). The revision included the following:

- Pneumococcal conjugate vaccine (PCV) which is a pneumococcal vaccine used to protect infants and young children against disease caused by the bacteria *Streptococcus pneumoniae*.
- Rotavirus vaccine which protects children from rotaviruses, which are the leading cause of severe diarrhoea among infants and young children.
- Pentaxim injection which is new 5-in-1 combination vaccine indicated for active immunisation of infants against diphtheria, tetanus, pertussis, poliomyelitis and invasive infections caused by *Haemophilus influenzae* type b such as meningitis, septicaemia, cellulitis, arthritis, epiglottitis, pneumopathy and osteomyelitis.
- Replacement of certain immunisations such as oral polio immunisation which was replaced by injectable polio immunisation and diphtheria and tetanus which were replaced by tetanus and diphtheria in reduced strengths.
- The adaptation of the ages at which the child should receive the immunisations. The immunisation age for children was changed from five years to twelve years and the set of immunisations previously given at five years were moved to six years.

The number of children receiving the immunisations is used as the short term indicator for the success of the programme. The two most important indicators used in the administrative method to measure the effectiveness of the immunisation programme are immunisation coverage and immunisation dropout rate (Ngomane, 2010). The South African National Department of Health has set an EPI target of 90% for the immunisation coverage and less than 5% for the dropout rate. Prior to 2010, South Africa has been able to achieve the target for the immunisation coverage, but, according to the WHO, immunisation coverage dropped to 64% in 2011 from the time latest changes were made (Africa Check, 2013). A number of studies have revealed that despite the advances in the EPI in South Africa, the programme continues to face a number of challenges (Siegfried et al., 2010; Zipursky et al., 2010; Schoub, 2011). The findings of these studies revealed that both immunisation coverage and community knowledge about immunisation is limited. The data information system for eThekweni district constantly reflected remarkably low immunisation coverage for children aged 6 to 12 years compared to the other age groups.

The present study was designed to examine the factors influencing the uptake of the revised EPI for children between the ages of 6 to 12 years at Umlazi Township, KZN.

Methodology

The study was conducted at Umlazi Township PHC clinics in the KZN Province of South Africa after ethical approval was obtained from the university research ethics committee (REC 49/13) and permission obtained from the Department of Health and Municipal authorities to conduct the study in their PHC clinics situated in Umlazi Township. Umlazi is the second largest township in South Africa, the first being Soweto. It is characterised as a densely populated area where an estimated 67% of households earn less than R2000 a month in the formal economy. The provision of PHC care services at Umlazi Township is shared between the Municipal and KZN Provincial Administration (KZNPA) Health authorities. There are 10 PHC clinics of which three are under the municipality and seven are under provincial health authority. Kuo et al. (2012) reported that 21% of the women who visit clinics in townships are HIV positive and that, a total of 22% of respondents from Umlazi Township were carers of AIDS-orphaned children.

Umlazi Township was chosen because the statistics from the KZN Department of Health which showed low coverage of EPI for children between the ages of six and 12 years. The 2011 census report reflects that South Africa has a population of 18.523.917 of which 6.018.608 are children between the ages of 6-11 years. This is one third of the population. The same report reflects a total population of 388.687 people in Umlazi Township. It can be estimated from

these figures that there are possibly 130.000 children in this age group in Umlazi Township. The number of children who received Td immunisation over a period of 6 months in 2013 (between April and September 2013) from the ten clinics in Umlazi is presented in Table 1. There were 4 to 201 children aged six years and zero to 90 children aged twelve years per clinic per month that received the Td vaccine (KZN Department of Health, 2014). These figures are below the number of children who should receive the immunisation to achieve target of 90% immunisation coverage as set by the National Department of Health (Department of Health, 2010).

All ten PHC clinics in Umlazi Township, seven from the provincial and three from the municipal health authority were included in the study. A total of 12 HCWs were providing EPI services in the ten PHC clinics. A minimum of one and maximum of two HCWs who were either a professional nurse and/or an enrolled nurse were involved in EPI services in each PHC clinic. All twelve (100%) HCWs were included in the study of which 50% (n=6) were professional nurses and 50% (n=6) were enrolled nurses. All HCWs who were not actively involved in provision of EPI services were excluded. A total of 110 child care givers (CCGs) per PHC clinic were purposively selected and included in the study amounting to 1009 CCGs for the entire study. Only biological, adoptive and foster parents including other persons who were fully responsible for the care of the children were regarded as CCGs and included in the study. All other persons who were not fully responsible for the children such as nannies, siblings, neighbours and other relatives and friends were excluded.

Information about the study was given to the HCWs and CCGs in order to ensure that those who agreed to participate in the study gave informed consent. Self-administered questionnaires were used to collect data from both the HCWs and the CCGs. The questionnaires for the CCGs were available in both English and isiZulu so that the respondents could choose the language they were comfortable with. The respondents were made to complete the questionnaires at their own convenient time and dropped them off in a sealed box that was provided at the PHC clinics. However, the research assistant remained at each PHC clinic throughout the data collection process to assist the CCGs who required assistance with completing the questionnaires. Twelve questionnaires were distributed to the HCWs and all returned. A total of 1100 (110 in each PHC clinic) questionnaires were distributed to the CCGs to safeguard against attrition. A total of 100 questionnaires were returned from one PHC and 101 from the nine PHC clinics which amounted to 90% (n=1009) questionnaires returned.

Table 1: Td coverage in Umlazi District for children aged 6 and 12 years for a period of six months

Health Authority	PHC Clinic	Age	April 2013	May 2013	June 2013	July 2013	August 2013	September 2013
P	P1	6 years	21	20	31	19	13	27
		12 years	7	5	6	6	22	5
	P2	6 years	35	23	34	29	40	42
		12 years	5	4	1	3	1	4
	P3	6 years	30	24	38	13	26	35
		12 years	3	1	3	1	3	4
	P4	6 years	8	11	9	6	8	12
		12 years	0	0	0	0	0	0
	P5	6 years	23	34	17	10	46	30
		12 years	2	1	1	0	3	1
	P6	6 years	11	4	16	13	20	10
		12 years	1	0	1	1	1	1
	P7	6 years	25	30	194	201	128	101
		12 years	72	89	90	78	25	12
M	M1	6 years	15	6	11	5	19	14
		12 years	2	8	3	12	1	2
	M2	6 years	5	6	15	13	10	8
		12 years	5	5	4	7	5	4
	M3	6 years	9	6	6	11	9	13
		12 years	2	2	3	5	0	4

Data analysis

The data from the questionnaire were captured and subsequently analysed using version 20.0 of the Statistical Package for the Social Sciences (SPSS) and is presented in the form of tables showing frequencies and percentages of the responses.

Validity and reliability

Reliability was ensured by conducting a pilot study with the caregivers for the children and HCWs who were working in one PHC clinic. The pre-testing of the data collection tools was conducted in one of the PHC clinics from eThekweni district. This clinic was located in the area with similar characteristics as the PHC clinics from Umlazi Township. This ensured that the respondents who participated in the pre-testing of the tools were homogenous with the main study respondents. The pilot study was done to test the questionnaire for face and content validity. There were no changes which were made on the tools. The respondents who participated in the pre-test were not included in the main study. A research assistant who spoke English and isiZulu was employed to assist whenever necessary the CCGs who did not speak nor understood English to complete the questionnaire. Confidentiality was maintained in data handling to ensure that there was no untoward association of individuals with data. In order

to ensure confidentiality, the questionnaires were identified only by numbers so there was no link between the respondents' identity and the information gathered.

Results

Demographic information of HCWs providing EPI services

A total of 91.7% (n=11) responded were females and one respondent (8.3%) was a male. The racial distribution was as follows: 91.7% (n=11) respondents were Black Africans, 8.3% (n=1) were Coloureds and there were no Indian and white respondents. The study consisted of equal number 50% (n=6) of enrolled nurses and professional nurses out of which 50% (n=6) had an experience of less than two years working in the well-baby clinic and the other 50% (n=6) had more than two years.

Number of CHWs involved in EPI per PHC clinic

According to the results of the study, 80% (n=8) of the PHC clinics had only one HCW responsible for providing EPI services out of which 33% (n=3) were professional nurses and 66% (n=6) were the enrolled nurses. There were 20% (n=2) PHC clinics that had two HCWs that were responsible for providing EPI services. One of them had two professional nurses and the other had one professional nurse and one enrolled nurse. These findings are presented in Table 2.

Table 2: HCWs involved in EPI

Health Authority	PHC Clinic	HCWs involved in EPI services by qualification		Total included in the study
		Prof Nurse	Enrolled Nurse	
Municipality	M1	0	1	1
	M2	0	1	1
	M3	0	1	1
Sub- total from Municipality		0	3	3
KZNPA	P1	1	1	1
	P2	0	1	1
	P3	2	0	2
	P4	0	1	1
	P5	1	0	1
	P6	1	0	1
	P7	1	0	1
Sub-total from KZNPA		6	3	8
Grand total for the entire study		6	6	12

HCWs' training and in-service education on EPI

Of the 12 respondents, 66.7% (n=8) respondent indicated that they had received EPI training and 33.3% (n=4) had not received EPI training. The reasons that were given by the four respondents for having not received training on EPI were as follows: 50% (n=2) of them were never invited to attend EPI training, 25% (n=1) were new employees and another 25% (n=1) was a temporary staff member. The responses with regards to in-service education were as follows: 25% (n=3) were receiving in-service training on EPI every month, 41.7% (n=5) rarely received in-service training and 33.4% (n=4) were not receiving in-service training at all.

Support of the CHCs from management

Concerning managers' support visits, 58.3% (n=7) reported that the manager conducted support visits every week, 8.3% (n=1) reported that they were getting the managers' support visits every month, 25% (n=3) reported this to happen every three months and 8.3% (n=1) reported that the managers did not conduct any support visits. Out of the 11 respondents who indicated that the managers conducted support visits, 27.3% (n=3) of them rated the support as being insufficient, 36.4% (n=4) rated it as being sufficient and 36.4% (n=4) rated it as being more than enough.

With regards to communication of the new developments regarding EPI services 75% (n=9) respondents stated that communication was done on time, 16.7% (n=2) responded that it was sometimes done on time and 8.3% (n=1) responded that it was never done on time. There were 58.3% (n=7) respondents who stated that management always attended to staff challenges regarding EPI services, 33.3% (n=4) stated that this happened sometimes and 8.3% (n=1) stated that this was not happening at all.

Availability of drugs and supplies in the PHC clinics

With regards to the availability of drugs and supplies 83.3% (n=10) of respondents stated that they always had sufficient stocks of all vaccines at the PHC clinics and 8.3% (n=1) stated that they sometimes had sufficient stock of all vaccines. A total of 91.7% (n=11) respondents stated that they always had all other immunisation equipment and supplies available at the clinic and 9% (n=1) indicated that this was not the case at her clinics. Most respondents (83.3%; n=10) stated that the vaccine fridge was always working well but 16.7 (n=2) indicated that the vaccine fridge sometimes worked well. All 100% (n=12) respondents stated that their clinics received the correct quantities of vaccines. Most respondents (75%; n=9) indicated that a system for emergency ordering of vaccines always existed. However, 3% (n=1) responded stated that the

emergency ordering system existed sometimes existed and 16.7% (n=2) indicated that there was no system for the emergency ordering of vaccines.

Knowledge of the HCWs regarding immunizations

Four sections to assess the knowledge of the HCWs regarding immunizations were included in the questionnaire. More than 50% respondents gave correct answers for each section. However, there were more respondents 47 % (n=5) who gave incorrect answers regarding missed opportunity, management and contra-indications to immunisation. There were no differences in average scores neither based on qualification nor on years of experience of the respondents. The average score for responses for each section were as follows:

- Section 1: Vaccines that were included in the EPI schedule: 80% (n=8) respondents answered all questions correctly and 40% (n=4) gave some incorrect answers.
- Section 2: The ages at which immunisations were given: 89% (n= 9) respondents answered all questions correctly and 11% (n=3) gave some incorrect answers.
- Section 3: The number of doses that the child should receive for each vaccine: 90% (n=10) respondents answered all questions correctly and 10% (n=2) gave some incorrect answers.
- Section 4: The true or false statements relating to missed opportunity, management and contra-indications to immunisation: 53% (n=7) answered all questions correctly and 47% (n=5) gave some incorrect answers.

The findings are presented in Figure 1.

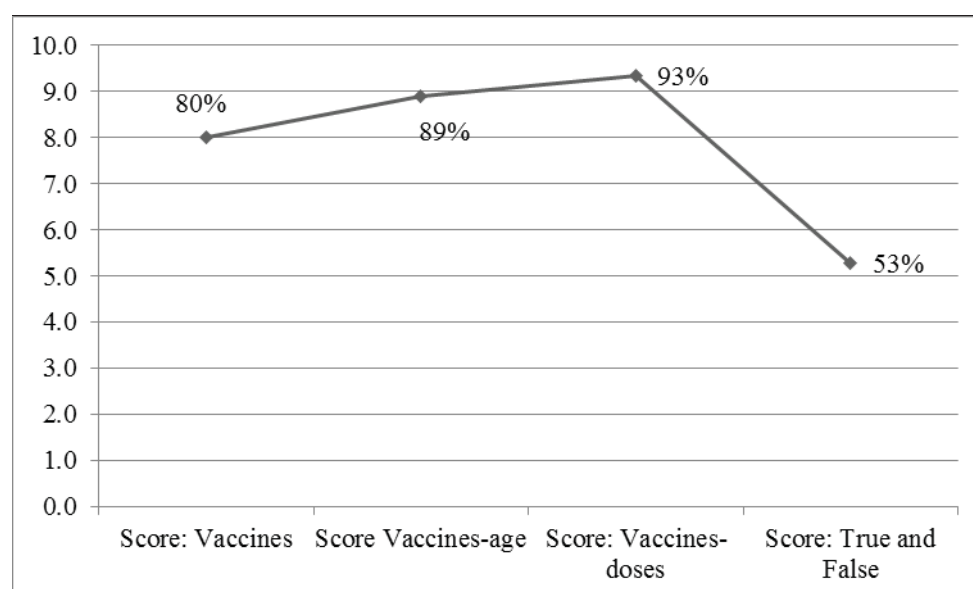


Figure 1: Scores for knowledge of HCWs about the EPI programme

Results of responses from the CCGs

Demographic information the child CCGs

The respondents were predominantly African black 100% (n=1009), females 96.1% (n=970) who spoke IsiZulu 87.8% (n=870), unemployed 52.2 % (n=526) and biological parents of the children they brought to the clinic 56% (n=582). A total of 3.9% (n=39) respondents were males. Of the other respondent 9.7% (n=98) spoke IsiXhosa, 2.3% (n=23) Sesotho, 1% (n=10) Venda and 1% (n=10) spoke SiSwati. A total of 50.7% (n=512) respondents had secondary education, 33.6% (n=339) had tertiary education, 7.2% (n=73) had primary education and 8.4% (n=85) had no education at all. A small proportion of the respondents 16% (n=161) were employed. The other respondents were 52.2 % (n=526) unemployed and 31.8% (n=320) were students. The majority of the respondents 63.5% (n=641) had one child and 36.5% (n=368) had more than one child. A total of 34% (n=343) respondents were legal guardians, 10% (n=103) were granny, nanny or siblings and 0% (n=1) were not specified. Information presented in Table 3.

Table 3: Total number of CCGs included in the study (n=10)

Health Authority	PHC clinic	Questionnaires distributed	Questionnaires returned	Percentage
KZNPA	P1	101	101	10.0
	P2	100	100	9.9
	P3	101	101	10.0
	P4	101	101	10.0
	P5	101	101	10.0
	P6	101	101	10.0
	P7	101	101	10.0
Sub-total for 7 KZNPA PHC clinics		706	706	69.9
Municipality	101	101	101	10.0
	101	101	101	10.0
	101	101	101	10.0
Sub-total for 3 Municipal PHC clinics		303	303	30%
Grand total for 10 PHC clinics		1009	1009	99.9%

Information relating to the clinic visit

With regards to the means of transport to the clinic 64.8% (n=646) indicated that they were walking to the clinic, 25.6% (n=255) used public transport and 9.6% (n=96) were using private transport. A total of 1.2% (n=12) did not respond to this question. The majority 76% (n=767) of the caregivers had brought children that were less than five years old. A total of 19.5% (n=197) had brought children

that were between five and six years and 4.5% (n=45) had brought in the children that were six to twelve years old.

The majority of the CCGs 61.2% (n=624) had brought the children for immunisation. Of the other respondents, 10.3% (n=185) had brought in the children because they were sick and 19.6% (n=197) had brought them for vitamin A, deworming and/or checking of weight. A total of 62.8% (n=619) indicated that their children were given immunisation on that day, while 37.2% (n=367) indicated that their children were not given immunisation on the day.

Knowledge of CCGs about immunization

A smaller proportion of the respondents indicated that they had knowledge regarding the information requested in this section. The majority either did not know the information or they did not respond to the question. With regards to what *immunisation their children had already received in the past* 41.0% (n=414) responded that they knew, 27.1 % (n=273) responded that they did not know the immunisations that their children had already received and 31.7% (n=320) did not respond to this question. Regarding *the immunisations that their children received on the day* 42.9 % (n=433) respondents responded that they knew 8% (n=81), did not know and 12% (n=121) did not respond to this question. Regarding *the date on which the children were due to receive the next immunisation* 59.6% (n=601) responded that they knew the date, 18.3% (n=185) did not know their and 20.6% (n=208) did not respond to this question.

In response to whether the respondents knew *the immunisations that their children would receive during the next visit* 37.1 (n=374) respondents responded that they knew, 33.3% (n=336) did not know and 29% (n=293) did not respond. With regards whether their children had *ever missed any immunisations* 25.4% (n=256) respondents stated yes, 44.7% (n=451) stated no and 29.9% (n=302) did not respond. In response to whether the respondents knew *what to do if the child misses an immunization* 47.7% (n=481) respondents they knew, 27% (n=272) did not know and 25.1% (n=253) did not respond. With regards to *what to do if the child get sick after the immunisation* 58.6% (n=591) knew, 21.6% (n=218) did not know and 19.8% (n=200) did not respond. In response to whether they knew *the days on which they could bring the children to the clinic for immunization* 84.4% (n=684) knew, 15.2% (n=123) did not know and (n=199) did not respond.

Information regarding the CCGs other children

A total of 43.7% (n=441) indicated that they had other children either than those brought to the clinic and 56.1% (n=566) did not have other children. A similar situation to the above was discovered where the majority either did not know the

information regarding the immunisation of their other children or they did not respond to the question. Of the 441 respondents who had other children 41.0% (n=414) responded that they knew what immunisation their children had already received, 27.1% (n=273) did not know and 31.7% (n=320) did not respond to this question. These respondents who indicated that they had other children were required to answer further questions regarding the immunisation status of the other children. The questions were intended to test the correctness of the information that the respondents provided. The results of the analysis of the responses from the respondents were as follows: a total of 36.2% (n=365) gave correct information, 2.0% (n=20) gave partly correct information and 5.8 % (n=59) gave incorrect information.

Satisfaction of the CCGs with the EPI services

The majority of the respondents were satisfied with the quality of care 41.5 % (n=419). According to the majority of the respondents 59.6% (n=601), the main issue that needed improvement was the organisation of clinic queues. Respondents were requested to rate the quality of the service that they were getting in the PHC clinics. Several statements were given and the respondents were required to rate these using the Likert scale of ‘poor’, ‘average’, ‘good’ and ‘very good’. The rating that was selected by the highest number of participant was ‘good’ followed by ‘very good’, then ‘average’. The rating that was selected by the least number of respondents was ‘poor’ except for the responses on the distance travelled to the clinic where the largest number of participant selected ‘average’, followed by ‘poor’ selected by 18.2% (n=184), ‘good’ selected by 17.7% (n=179) and ‘very good’ 13.1% (n=132). Results are presented in Table 4.

Table 4: Presentation of results for the analysis of responses regarding quality of service

Element assessed	Poor	Average	Good	Very good	No Response
Satisfaction with the service received today	2.6% (n=26)	8.7% (n=88)	49.7% (n=502)	38.8% (n=392)	0.1% (n=1)
Satisfaction with overall service at this clinic	2.1% (n=21)	7.1% (n=72)	56.3% (n=568)	34.1% (n=344)	04% (n=4).
Information received at the clinic about immunisation	0.4% (n=4)	12.3% (n=124)	52.4% (n=529)	31.3% (n=316)	3.6% (n=36)
Attitude of staff in the clinic	1.6% (n=16)	16.8% (n=170)	41.3% (n=417)	38.6% (n=389)	1.7% (n=17)
Waiting time at the clinic	10.8% (n=109)	30.9% (n=312)	40.4% (n=408)	15.3% (n=154)	2.6% (n=26)
Operation times of the clinic	2.7% (n=27)	25.1% (n=253)	41.1% (n=415)	28.7% (n=290)	2.4% (n=24)
Distance travelled to the clinic	18.2% (n=184)	49.2% (n=496)	17.7% (n=179)	13.1% (n=132)	1.8% (n=18)

The respondents were requested to state the things that they dissatisfied about at the clinic and to suggest two things that they wished could be improved. The themes that emerged from the responses were grouped and quantified as follows:

- Waiting time was highlighted by 53.3% (n=538) respondents.
- Interruption of services during tea and lunch breaks was highlighted by 58.2% (n=587) respondents.
- Attitude of staff was highlighted by 48.3% (n=487) respondents.
- Availability of medicines and other supplies was highlighted by 52.6% (n=531) respondents.
- Access to the PHC clinics was highlighted by 46.0% (n=464) and
- The number of nursing staff working in the PHC clinic was highlighted by 54.7% (n=552) respondents.

Discussion

Qualifications of HCWs working in well-baby clinics

The findings the study reflect that 50% (n=6) of the PHC did not have professional nurses working in the EPI services. The EPI services in these PHC clinics were provided by the enrolled nurses. This is not in line with the provision of the South African Nursing Council (SANC) and could potentially influence how the EPI is implemented. According to the South African Nursing Council (1984), the enrolled nurses have a more limited scope of practice than the professional nurses and should always work under the direct supervision of the professional nurse. This implies that enrolled nurses should not be allocated to work alone in health care units, including EPI services.

Training and in-service Training on EPI

All respondents indicated that they had received basic and some in-service training on EPI. However, 41.7% (n=5) of the respondents indicated that in-service training was not frequent. According to Poggenpoel (2013), basic and in-service training is necessary in order to satisfy the needs of the community, health care organisations, patients and nurses for quality patient care that is cost-effective. Training and frequent in-service education on EPI are crucial for ensuring that the HCWs are competent and are kept updated on the new developments in EPI and to enable them to manage the demands of EPI programme.

Experience in EPI services

The majority of the respondents indicated that they had worked for more than one year providing EPI services. There were however a few that indicated that they had an experience of less than one year. Nkowane et al. (2009) highlight the

importance of experience in the nursing profession stating that nurses and midwives are key providers of nursing and that if their skills and experience are maximized; they can contribute significantly to positive health outcomes. In some clinics, enrolled nurses were allocated to provide the EPI alone without the supervision by professional nurses. This was identified as a gap in how the EPI was being implemented because as stated earlier according to the SANC (1984 as amended in 1991) the enrolled nurses should not be allocated to work alone but should always work under the direct supervision by a professional nurse.

Support received from management

Although some respondents indicated that they received frequent management support, some indicated that the support was not that frequent and others responded that they never received any management support at all. Importance of supportive management which is part of leadership and government is highlighted in the six pillars on which to build a strong health system by the WHO. These are: leadership and governance, financing of health system, health information, health service delivery, human resources and medical and drug supply (WHO-UNICEF 2009). According to the WHO (2005), strengthening the immunisation system by improving managerial skills of EPI managers is one of the keys to improving immunisation rates as this will facilitate supportive management.

Supply and control of vaccines and material resources

With regards to sufficient stocks of all vaccines, most respondents (83.3%; n=10) always had sufficient stocks of all vaccines at their PHC clinics but one respondent (8.3%) indicated that they sometimes had and sometimes did not have sufficient stocks. Having sufficient stock is always critical for EPI services in order to avoid missed immunisation opportunities, contributing to decreased immunisation coverage and increased mortality rates due to vaccine preventable diseases. The WHO-UNICEF (2009) highlight the importance of having medical and drug supply as one of the six pillars on which to build a strong health system.

It is important that every immunisation programme must assess its cold chain equipment periodically and replace broken equipment not worth repairing (USAID, 2008). Although the majority of the respondents (83.3%; n=10) stated that the vaccine fridges in their PHC clinics were always working well, a total of 16.7% (n=2.) reported that this was not always the case. A properly functioning vaccine fridge contributes to a proper cold chain management. However, if the vaccine fridge is not always working well that will affect the cold chain, potentially reducing the effectiveness of the vaccines and increasing the

probability of morbidity and mortality rates attributable to vaccine-preventable diseases.

The majority of respondents (75%; n=9) indicated that the system for emergency ordering of vaccines existed in the PHC clinics where they were working but (16.7%; n=2) indicated that it did not exist. Unavailability of the system of emergency ordering of the vaccines is one of the factors that affect the uptake of immunisation in a negative way because the clinics would not be able to access vaccines timeously when they run short of supplies. Subsequently, shortage of vaccines can have a negative impact on the success of immunisation as it can lead to unnecessary drop-out rate and missed opportunity. It is for this reason that the Centres for Disease Control and Prevention (2014) emphasises that that emergency vaccine retrieval and storage plans be available for all PHC clinics. According to Centres for Disease Control and Prevention (2014), the plan should consist of up-dated information regarding procedures to follow in cases of vaccines shortages or stock outs and should be read, understood and implemented by all HCWs involved in the EPI services.

Although there were some respondents who stated that new EPI developments were always communicated timeously, but others stated that these were sometimes communicated timeously while others stated they were not communicated timeously. Due to changes that constantly take place with the EPI it cannot be overemphasised how important it is to communicate new developments timeously. While communicating new developments timeously is a way of cascading the information to the relevant stakeholders, on the other hand, it is away of involving stakeholders so that they can develop a sense of belonging and commitment. According to Smith et al. (2013), involving stakeholders in curriculum design introduces fresh insight that can improve the way a course or module is designed and delivered and find solutions to challenging issues. The same could be said for involving the HCWs in the EPI programme where this would introduce fresh insight that can improve the way a course EPI is delivered and find solutions to challenging issues regarding the programme.

Giving the immunisation to the children that were brought to the clinic

The information gathered from the CCGs included assessing the number of children that were given the immunisation from those that were brought to the clinic. Several children were not given the immunisation although the majority of these children were due to receive the immunisation. Several reasons could be responsible for this ranging from missed poor assessment by providers to objection from the CCGs because the child is sick. The important highlight is that of the missed opportunity based on the EPI guidelines which emphasize that

any sick child that is well enough not to be admitted to hospital but is sent home is well enough to be immunised (Department of Health, 2010).

Demographics of CCGs

A higher proportion of respondents were black African females who spoke isiZulu. Though the majority of the CCGs spoke isiZulu, a minority spoke other languages that the respondents might not have been familiar with and that could have a negative influence on immunisation as this could be a barrier to communication. According to Houle (2010), misunderstanding of medical information and the lack of therapeutic relationship between providers and patients are problems encountered when patients have limited language proficiency. The majority of nurses reported that language barriers are a significant impediment to quality care and a source of stress in the workplace (Houle, 2010).

Relationship of the care givers to children

The results of the study reflect that the majority CCGs were females and they were the biological parents of the children that they had brought to the clinic. Female biological parents play a very important role in influencing immunisation uptake as they are the ones who make a decision to have their children immunised and some of them had had an opportunity of getting health information regarding the care of the baby including immunisation during antenatal care. Adeyinka et al. (2009) attest to this in their study conducted in South-Western Nigeria where they discovered that a good proportion of children were fully immunised as almost all women interviewed were aware of immunisation because of the information obtained during antenatal clinic.

The CCGs' level of education and socio-economic status

In relation to level of education though few CCGs had tertiary education; some had no education at all. Few were employed but others were unemployed. The level of socio-economic status and that of education also contributes to uptake of immunisation. According to Palmer (2013), a number of large studies have shown that under-vaccination is significantly more common among less educated members of the public. By socio-economic deprivation, this database also shows that children living in most disadvantaged households are less likely to be fully immunised. According to New Zealand statistics, people with fewer economic resources tend to have poorer health outcomes due to a combination of factors including difficulty in accessing health services (Statistics New Zealand, 2007).

The CCGs' knowledge of EPI

Knowledge of the CCGs about the immunisation was identified as a factor that negatively influenced the uptake of immunisation. A number of CCGs did not know some of the information about EPI. Nevertheless, several care givers had some knowledge regarding the type of immunisation that the children had receive (41.0%; n=414), received on that day (42.9%; n=433) and those still to have (37.1%; n=374), the date when these were due, ever missed immunisations (25.4%; n=256) and what to do when children missed immunisations and when children were sick after immunisation (58.6%; n=591), and the day when to bring the child to the clinic (84.4%; n=684). Lack of knowledge among caregivers is one of the contributing factors affecting immunisation uptake. According to Simone et al. (2012), gaps in knowledge and poor communication from HCWs are detrimental to high immunisation rates. Correct and transparent information for parents plays a key role in the parental decision on whether to have their children vaccinated. Amin et al. (2012) state that basic caregivers' knowledge about immunisation is one of the key determinants of the success of vaccination. A number of studies revealed that despite the advances in the EPI in South Africa, the programme continues to face a number of challenges (Siegfried et al., 2010; Schoub, 2011). The findings of these studies revealed that both immunisation coverage and community knowledge about immunisations is low (Zipursky et al., 2010).

Clinic infrastructure and cleanliness

Frequencies also revealed that some respondents were dissatisfied with the infrastructure and cleanliness of toilets According to Schulster (2003), cleaning is important particularly in work areas because deposits of dust, soil and microbes on surfaces can transmit infection. Public health infrastructure is fundamental to the provision and execution of public health services at all levels. Therefore, a proper infrastructure is essential in order to meet the above goals so as to be able to provide efficient service to the CCGs thus improving immunisation uptake.

Distance travelled to access health care services

With regards to the means of transport to the clinic the study findings showed that the majority of the CCGs walked and most of the remainder used public transport. Amin et al. (2013) argue that "walking is much longer in time for some families particularly during the wet seasons and that access to services may be blocked by poor road conditions". The findings were that some CCGs were not happy about the distance travelled to the clinic and others were using public transport. Due to long distance travelled and money to pay for public transport some CCGs could lose interest in immunising their children. This is further

supported by the Amin et al., 2013) in that walking is much longer for some families particularly during the wet seasons; access to services may be blocked by poor road conditions and that could affect immunisation uptake badly.

The waiting times

The majority of the respondents responded that they were not happy about waiting time, interruption of services during tea and lunch breaks, attitude of staff, availability of medicines and other supplies, access to the PHC clinics, and the number of nursing staff working in the PHC clinic. Other researchers support this. According to Amin et al. (2013), key determinants of the success of vaccination efforts are HCWs attitudes, the manner in which patients are treated, aspects of service organisation and adequate supply of vaccines. Therefore, lack of these determinants can contribute to factors limiting immunisation uptake. The study findings revealed that respondents were happy about the quality of care; however organisation of queues needed improvement. Long queues could contribute to health caregivers not bringing children for immunisation thus affecting immunisation uptake. The findings of the study by Amin et al. (2013) further revealed that increased access resulted in long waiting times and queues, contributing to dissatisfaction with the service which could lead to missed appointments and non-compliance with established treatment plans.

Limitations of the study

The study was conducted in one district in KZN and the study findings may therefore not be generalised. However, the results could be used in other districts to increase awareness of factors that influence immunisation uptake. The sample for the HCWs was too small due to the number of HCWs who were involved in EPI services in the PHC clinics. This has implications for statistical analysis that was carried out. The majority of children brought for immunisation were mainly from the age group of five years and below compared to the age group between 6 to 12 years. This hindered getting a broader perspective on factors that specifically influenced the uptake of immunisation for children between 6 and 12 years.

Recommendations

The following recommendations were made based on the findings of the study and such findings were seen as factors that limited immunisation uptake:

- The major gap identified by this study was regarding knowledge of the CCGs regarding immunisation. It is therefore, recommended that the HCWs need to ensure that information on immunisation is cascaded to CCGs by strengthening

health education talks at every health service point where women especially CCGs present.

- Open communication is the basis for any organisation to be successful and function efficiently. It should be immediate and transparent at all levels so that any new developments are communicated timeously.
- Management support and availability is vital to sub-ordinates so that they are able to voice their concerns and get clarity on some queries regarding new developments in the programme. Constant supportive supervision should be ensured until HCWs are confident with new changes in the programme.
- Adequate supply of both human and material resources should be ensured at all times for efficient rendering of the service.
- HCWs are considered by parents as a primary and trustworthy source of formation. Training of HCWs is crucial in order to bridge the gaps in knowledge.
- Due to constant changes in EPI, it is of vital importance that HCWs receive frequent in-service training so as to be always abreast with new developments.
- Nursing research is valuable and must be encouraged and developed in order to build the profession. Further research is recommended that will explore the factors that influence the uptake of the revised immunisation for children between 6 and 12 years on a wider scale involving other provinces. This will provide a broader picture on the immunisation uptake in the whole country.

Conclusion

While the uptake of the for children between the ages of six to twelve years remains low in the Umlazi Township, the study identified several factors that have positive influence on the uptake of immunisations. These factors could be used to strengthen the EPI services in the area and improve the uptake of the immunization. It is important that the factors that have a negative influence on the uptake of immunisation were also identified because the awareness of these factors can facilitate the development of strategies to overcome them. Thus the researcher considered both the positive and the negative factors when drawing the recommendation from the study.

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