



**A GROWTH MONITORING AND PROMOTION INDEX TO IMPROVE CHILD HEALTH IN UMGUZA DISTRICT IN
ZIMBABWE**

BY

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A thesis submitted in fulfilment of the requirement for the degree:

Doctor of Philosophy in Public Health

**UNIVERSITY OF VENDA
SCHOOL OF HEALTH SCIENCES
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January 2023

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Declaration

I **Shamiso Alice Dzumbunu (20025413)**, declare that this thesis submitted by myself, titled "***A Growth Monitoring and Promotion Index to improve Child health in Umguza district in Zimbabwe***," has not been submitted previously for a degree at this or any other university, that it is my work in design and execution, and that all reference material contained therein has been duly acknowledged.



Signature:

Date: 31/01/2023

Preface

Growth monitoring and promotion is a significant part of the nutrition surveillance system in Zimbabwe and takes place mainly through the primary health care system, supported by community health workers at the community level. It is a preventive approach towards preventing child malnutrition, morbidity and mortality. Not many indexes exist that are used in determining the health status of children under five years, so it is thus important for continued research for improved child health outcomes. This thesis is presented in article format and comprises three sections: Section A gives the thesis overview (this is the 1st paper of the thesis), Section B provides the manuscripts/articles with journal guidelines for authors, and Section C presents the thesis's conclusion, limitations and recommendations.

Section A: Thesis Overview

Development of a Growth Monitoring and Promotion Index to improve Child health in Zimbabwe: A Protocol

This paper presents the study protocol that details the study's background, problem statement, objectives and methodology. The article further offers a detailed outline of the research methods used to collect and gain insight into the data right up to the development of the new index. The paper was published in Elsevier's MethodsX Journal.

Section B: Papers/Articles

This section has a total of four papers, as outlined below:

Growth Monitoring and Promotion and Index development for improved child health: A Scoping Review using Rodgers Concept Analysis Framework:

This paper was a scoping literature review on grow monitoring and promotion for children under five years, along with indexes related to growth monitoring and promotion. Rodger's concept analysis framework guided the study. The paper ended with identifying some gaps for further research. The review paper was accepted in The Open Public Health Journal.

Knowledge and performance of growth monitoring and promotion activities by Community Health workers in Umuza District, Zimbabwe

This paper used a quantitative research design to establish the growth monitoring and promotion (GMP) activities among community health workers (CHWs). This was achieved through socio-demographic characteristics, frequency of selected GMP activities and CHW knowledge levels. This paper also shows the relationship between the CHW knowledge levels and their frequency of conducting GMP activities. The article was submitted to PLOS Global Public Health Journal and is under review.

Barriers and Facilitators to growth monitoring and promotion in Zimbabwe: Caregiver perspectives

This paper explored the barriers and facilitators affecting caregivers of children under five years. The barriers identified were those that prevent the caregivers from attending GMP activities carried out by CHWs, while facilitators serve as influencers towards their attendance. Recommendations towards addressing some of the challenges faced by GMP have been shared with the hope that Social Behaviour change practitioners will develop strategies that leverage the facilitators while also addressing the identified barriers. This paper was submitted to The Children's Health Care Journal and is under review.

Growth Monitoring and Promotion Index development: A novel approach

This section outlines the new GMP index's development and its validation process. The index was developed mainly through 3 phases: Phase 1 involved a scoping literature review in identifying existing child health indexes. Phase 2 involved a CHW survey which explored the frequency of GMP activities and a Barrier Analysis among caregivers of children under-five years (CU5), which sought to identify the barriers and facilitators towards growth monitoring and promotion attendance. Phase 3 was the development of the index, which was then validated through the Delphi technique. Using the Delphi technique, fifteen technical experts were recruited from different professional domains to analyse the index variables and provide recommendations for

any refinement. There were no adjustments proposed to the new index. This paper was submitted to the Healthcare Journal and is under review.

Section C: Summary, Recommendations, Study limitations, Implications of the study and Conclusions

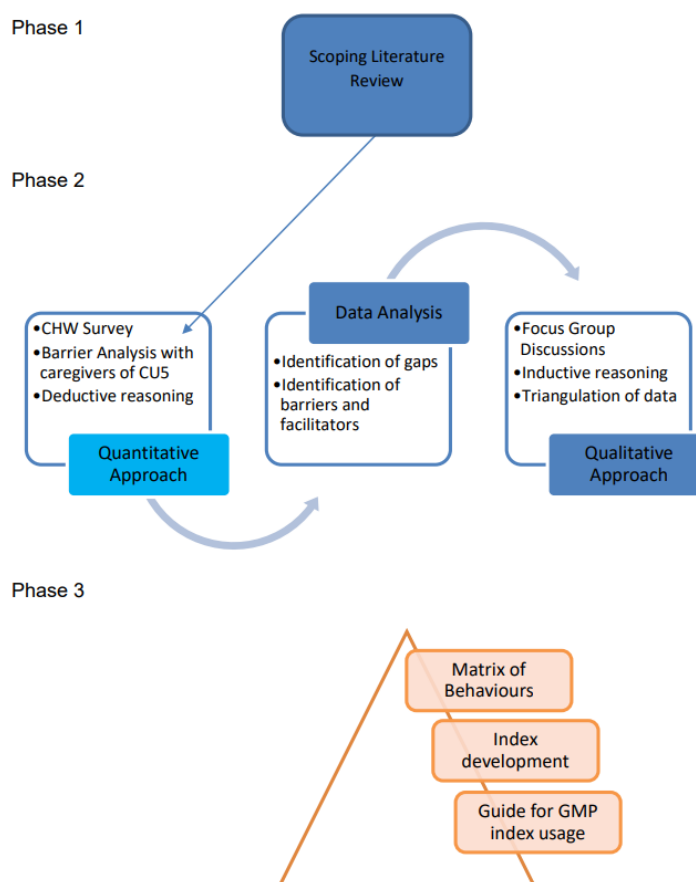
This section presents a summary of the study, makes important recommendations and gives the study limitations as informed by the entire research process. The implications of the study are outlined along with the study conclusions.

Publications

1. **Moyo, S.A.**, Mashau, N.S., and Makhado, L. (2023). Development of a Growth Monitoring and Promotion Index to improve Child health in Zimbabwe: A Protocol. *MethodsX*. <https://doi.org/10.1016/j.mex.2022.101958>.
2. **Moyo, S.A.**, Mashau, N.S., and Makhado, L. (2023). Growth Monitoring and Promotion and Index development for improved child health: A Scoping Review using Rodgers Concept Analysis Framework. *The Open Public Health Journal*. <http://dx.doi.org/10.2174/18749445-v16-e230320-2022-205>
3. **Moyo, S.A.**, Mashau, N.S., and Makhado, L. Knowledge and performance of growth monitoring and promotion activities by Community Health workers in Umguza District, Zimbabwe. *PLOS Global Public Health*. (Under Review).
4. **Moyo, S.A.**, Mashau, N.S., and Makhado, L. Barriers and Facilitators to growth monitoring and promotion in Umguza District, Zimbabwe: Caregiver perspectives. *Children's Health Care Journal* (Under Review).
5. **Moyo, S.A.**, Mashau, N.S., and Makhado, L. (2023). Growth Monitoring and Promotion Index development: A novel approach. *Healthcare Journal*. <https://doi.org/10.3390/healthcare11142011>.

Abstract

In Zimbabwe, growth monitoring and promotion, as conducted by community health workers, are part of the nutritional surveillance system. This study seeks to develop a new index combining caregiver behaviours, attitudes and CHW growth monitoring and promotion activities. A sequential design will be conducted in three phases. Phase one will comprise a scoping literature review. The second phase will comprise a needs analysis through quantitative data collection using two surveys of community health workers and caregivers of children under five years. After that qualitative data will be collected from caregivers of children under five years. The quantitative data will be analysed using SPSS, while qualitative data will be collected and analysed using Atlas-ti. Phase three will be the development phase for the growth monitoring and promotion Index. The growth monitoring and promotion Index will be used to classify the GMP performance of districts through the district health information system (DHIS2), thus strengthening the quality of growth monitoring and promotion. Recommendations on the findings and the adoption of the Index will be shared with the Ministry of Health and Child Care, and key stakeholders implementing maternal, newborn and child health programmes in Zimbabwe for adoption and use in growth monitoring and promotion programming.



Keywords: Caregivers, Community health workers, Barrier Analysis, Children under five years, Index Development, Zimbabwe

Dedications

"All that I am or ever hope to be, I owe to my angel mother."

Abraham Lincoln

I dedicate this work to my late mother **Katharine Moyo neeMaswanhise** (10-03-1954 to 06-04-2016). I am beyond blessed to have been born of a mother such as you. You taught me and showed me the true meaning of hard work; your life was a testament to this. You left a deep wound in my heart that bleeds when you passed on. My life has never been the same. Sadly, you did not live to see me attain this PhD (May your soul rest in eternal peace, mum).

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I want to thank God Almighty, for His mercy and Grace over my life. I am thankful for the gift of life that enabled me to complete this work. I would also like to recognise the following people who played a significant role in the conception and execution of this research project:

- ✚ **M Maphosa:** I am forever grateful for your insights and how you entertained my nagging ideas until I conceptualised my research topic. I am blessed to have had such a brilliant mind to tap into. **Ngiyabonga.**

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- ✚ **My Father-Mr C Moyo:** Thank you, dad, for the strong educational foundation you set for me from childhood. Ndipo pazvatisvitsa pano. **Makaita henyu baba!**

- ✦ **My children:** For several years, you have seen me toiling with one academic quest after another. This is the pinnacle for now. I pray that as a mother, I have inspired you to follow your dreams in whatever you set your minds and hearts in. The sky is not even the limit.
Reach beyond the sky!
- ✦ **My friends:** Rudo, Delilah and Nontokozi. Thank you for always being there for me and checking in on me. Providing much-needed shoulders when the going went tough and much-needed chit chat to distress. **Thank you, girls!**
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- ✦ **MOHCC Matabeleland North Provincial and District Offices:** Thank you for your support and permission to conduct this study. I hope this index will go a long way in supporting GMP activities.
- ✦ Lastly, to those that are not mentioned or those that I may have omitted, I appreciate you and all that you did to assist me in completing this research.

List of acronyms and abbreviations

BA	Barrier Analysis
GMP	Growth Monitoring and Promotion
CU5	Children under five years of age
CHW	Community Health Worker
DHIS	District Health Information System
FGDs	Focus Group Discussions
MUAC	Mid-Upper Arm Circumference
MOHCC	Ministry of Health and Child Care
MRCZ	Medical Research Council of Zimbabwe
PHC	Primary Health Care
SBC	Social Behaviour Change

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Conceptual and Operational definition of terms

Child health: Child health is defined by the National Research Council and Institute of Medicine (2004) as ‘the extent to which individual children or groups of children are able or enabled to (a) develop and realise their potential, (b) satisfy their needs and (c) develop the capacities that allow them to interact successfully with their biological, physical and social environments.

Community Health Worker: Community Health Worker is defined by Lewin et al. (2010:7) as “any health worker carrying out functions related to health care delivery; trained in some way in the context of the intervention, and having no formal professional or paraprofessional certificate or degree in tertiary education”. In this study, the CHW referred to is the Village Health Worker (VHW).

Health Care Worker: The term “health care worker” has previously been defined as “all people engaged in actions whose primary intent is to enhance health” and was not restricted to physicians, nurses, allied health personnel, health educators, social workers, midwives, community health workers, laboratory personnel, pharmacists, radiographers, volunteers, orderlies, and health-facility administrators (Joshi et al., 2006; WHO, 2006). In this study, the HCWs referred to are doctors, nurses, environmental health technicians and district nutritionists.

Growth monitoring: Growth monitoring is the regular weighing, measuring and plotting of a child’s growth over time to carry out scientific interpretations that aid in counselling while also creating evidence-based interventions if abnormal growth is identified (Garner et al., 2000). This study will make use of the definition below.

Growth monitoring and promotion: According to WHO (2006) guidelines, Growth Monitoring and Promotion includes (1) the routine measurement of a child's weight and length/height; (2) the plotting of the child's measurements and comparison of the child's status to a standardised growth chart to assess growth adequacy; (3) growth-informed counselling; and, if necessary, (4) the undertaking of remedial, health-promoting action. This study will refer to this definition as defined by WHO.

Growth monitoring and promotion index: A composite Index derived from the metrics of the barriers and facilitators towards GMP by caregivers of CU5 years and the monthly GMP statistics of CU5 years conducted by CHWs. This index is based on the GMP definition stated above.

Primary Health Care Facility: This is the most basic structured health system providing care for simple, common problems at the community level (Bitton et al., 2017). In this study, this refers to clinics found in the district.

Caregivers of CU5: Caregivers will be the mothers or other family members primarily responsible for attending to the child's health (Mishra, Mohapatra & Kumar, 2019). This will refer to mothers or legal guardians who care for children under five years living in the Umguza district.

Nutritional Surveillance: This is the regular and systematic data collection on dietary outcomes and exposures (Tuffrey & Hall, 2016).

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Section A: Thesis Overview

Development of a Growth Monitoring and Promotion Index to improve Child health in Zimbabwe

Published as:

Moyo, S.A., Mashau, N.S., and Makhado, L. (2023). Development of a Growth Monitoring and Promotion Index to improve Child health in Zimbabwe: A Protocol. *MethodsX Journal*. <https://doi.org/10.1016/j.mex.2022.101958>

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0.0 Abstract

In Zimbabwe, growth monitoring and promotion, as conducted by community health workers, are part of the nutritional surveillance system. This study seeks to develop a new index combining caregiver behaviours, attitudes and CHW growth monitoring and promotion activities. A sequential design will be conducted in three phases. Phase one will comprise a scoping literature review. The second phase will include a needs analysis through quantitative data collection using two surveys of community health workers and caregivers of children under five years. After that qualitative data will be collected from caregivers of children under five years. The quantitative data will be analysed using SPSS, while qualitative data will be

collected and analysed using Atlas-ti. Phase three will be the development phase for the growth monitoring and promotion Index. The growth monitoring and promotion Index will be used to classify the GMP performance of districts through the DHIS2, thus strengthening the quality of growth monitoring and promotion. Recommendations on the findings and the adoption of the Index will be shared with the Ministry of Health and Child Care, and key stakeholders implementing maternal, newborn and child health programmes in Zimbabwe for adoption and use in growth monitoring and promotion programming.

The study protocol was approved by the University of Venda Human Research Ethics Committee (**FHS/21/PH/23/0511**) and the Medical Research Council of Zimbabwe (**MRCZ/A/2877**).

Keywords: Caregivers, Community health workers, Barrier Analysis, Children under five years, Index Development, Zimbabwe

1.0 Background

In Zimbabwe, Growth Monitoring and Promotion (GMP) is part of the nutritional surveillance system, which aims to serve as an early warning system for child growth and development problems. The community-based growth monitoring programme is carried out at the village level by CHWs who go on to report the number of children they monitor, including those malnourished, to the health facility within their catchment area. This data from the health facility filters up to the district as part of the health information system (DHIS2). This study aimed at developing a GMP index to improve the quality of GMP activities to support the overall child health and nutrition of CU5 in the Umguza district.

1.1 Study rationale

The classification of GMP is currently based on independent indicators in the DHIS2, such as the number of CU5 weighed monthly by Village Health Workers and the number of children under five (CU5) who received vitamin A. There is no indicator that captures why caregivers do not bring their children for monthly GMP. This has resulted in a disconnect between caregiver behaviours and attitudes and the quantitative indicators in the DHIS2. In order to have more meaningful GMP indicators, there is a need to consider the key aspects of GMP which are CHW's activities and the behaviour and attitudes of caregivers of CU5 towards GMP. The construction of the GMP index will ensure that all these GMP elements are represented in one informative Index in which caregiver behaviours, attitudes and CHW GMP activities are combined. This will then provide more meaningful information on the status of GMP activities in a particular district allowing for appropriate resource allocation based on accurate performance.

1.2 Study purpose and objectives

The following are the study's purpose and objectives:

1.2.1 Study purpose

To develop a GMP index to improve child health in the Umguza district in Zimbabwe.

1.2.2 Study objectives

Phase 1: Literature review

1. To explore and analyse knowledge gaps about GMP activities,
2. To describe key characteristics related to GMP index development.

Phase 2: Needs analysis

- 1) To explore the process of GMP within the Umguza health system as conducted by CHWs,

- 2) To determine how knowledge of growth monitoring and promotion by CHWs translates to a frequency of activities,
- 3) To determine the barriers and facilitators towards GMP attendance by caregivers of CU5,
- 4) To identify sustainable best practices among CHWs, consistently conducting growth monitoring and promotion activities.

Phase 3: Index development

- 1) To construct a GMP Index and guidelines for usage,
- 2) To test and validate the GMP index.

1.2.3 Research questions

- 1) What is the process of GMP as conducted by CHWs?
- 2) How does knowledge of GMP by CHWs affect the frequency of activities?
- 3) What are the best practices among those CHWs consistently conducting GMP activities?
- 4) What are the barriers and facilitators towards GMP activities by caregivers of CU5?

1.3 Conceptual framework for the study

The study will be guided by the conceptual framework for GMP by Ashworth et al. (2008). This framework outlines the whole GMP process as would be conducted by a CHW or a health worker through two mechanisms: first, the detection of the problem by the CHWs, and second is a vehicle for health promotion through positive behaviour change adoption by caregivers of CU5 (Ashworth et al., 2008).

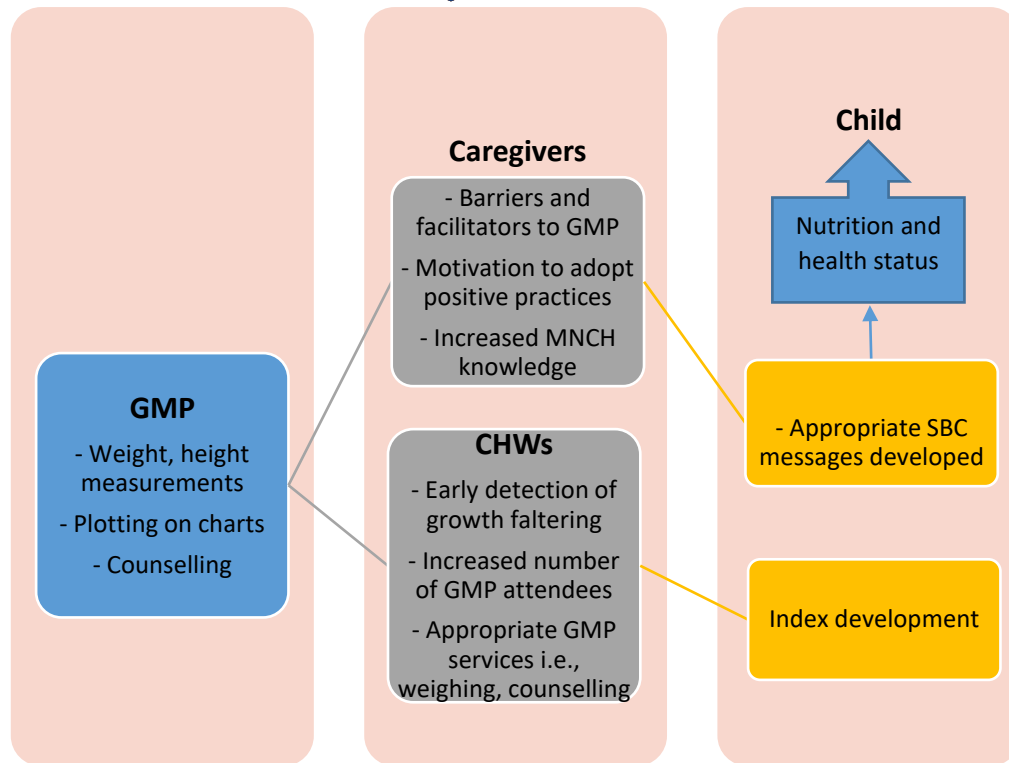


Figure 1: Conceptual framework for improved growth monitoring and promotion.

Adapted from: Ashworth, Shrimpton & Jamil, (2008).

From this model, GMP activities are meant to be done by CHWs routinely within the MOHCC health system. These activities consist of weight, height and MUAC measurements, plotting into the child's health card, and age-appropriate counselling for the caregivers. However, GMP at the community level is directly linked to the caregiver behaviours and attitudes towards it and the performance of CHWs in conducting the actual GMP activities. These are the constructs from which data will be collected.

This framework highlights two important players central to the GMP of CU5, which are the CHWs and caregivers. The study focused on both. The CHWs are the first point of contact with the caregivers; hence it was established through a survey how they conducted their monthly GMP processes and activities. Through a barrier analysis with the caregivers of CU5, the study explored the barriers and facilitators towards their GMP attendance. The outcome of this knowledge aided in identifying the different types of caregiver behaviours.

Once caregiver behaviours and attitudes towards GMP were identified and GMP activities by CHWs established, a GMP Index was constructed. The researcher anticipated that due to the composite nature of the index, more appropriate classification of GMP activities within the district will be done. The hope is that this would ultimately result in the design of a more targeted approach towards improved GMP activities and child health in general.

2. METHODOLOGY

The study has adopted a mixed-methods approach. The research design was a multi-phase.

2.1 Research approach

A mixed-methods research approach is where the researcher combines both quantitative and qualitative research approaches to increase the breadth and depth of understanding of the study elements (Creswell & Plano Clark, 2018). In this study, both quantitative and qualitative data were collected sequentially. The researcher chose a mixed-method approach to enhance the integrity of the findings and obtain generalisability of the results along with depth that will come from the results (Creswell & Plano Clark, 2018). The mixed-methods approach provided complementarity of the results as each method sought to address different objectives of the study.

2.1.1 Outline of the study process

The study was conducted in three phases. The first phase involved a scoping literature review. The second phase began with collecting quantitative data through a survey of CHWs and a barrier analysis of caregivers of CU5. Data analysis was done, and gaps for further probing identified. Qualitative data was then collected through focus group interviews and analysed. All the findings were triangulated. The third phase involved the development of an Index to measure GMP through CHW GMP activities and CU5 caregiver behaviours towards GMP. The study also came up with guidelines on the use of the index. An illustration of the study phases is shown in Figure 2 below.

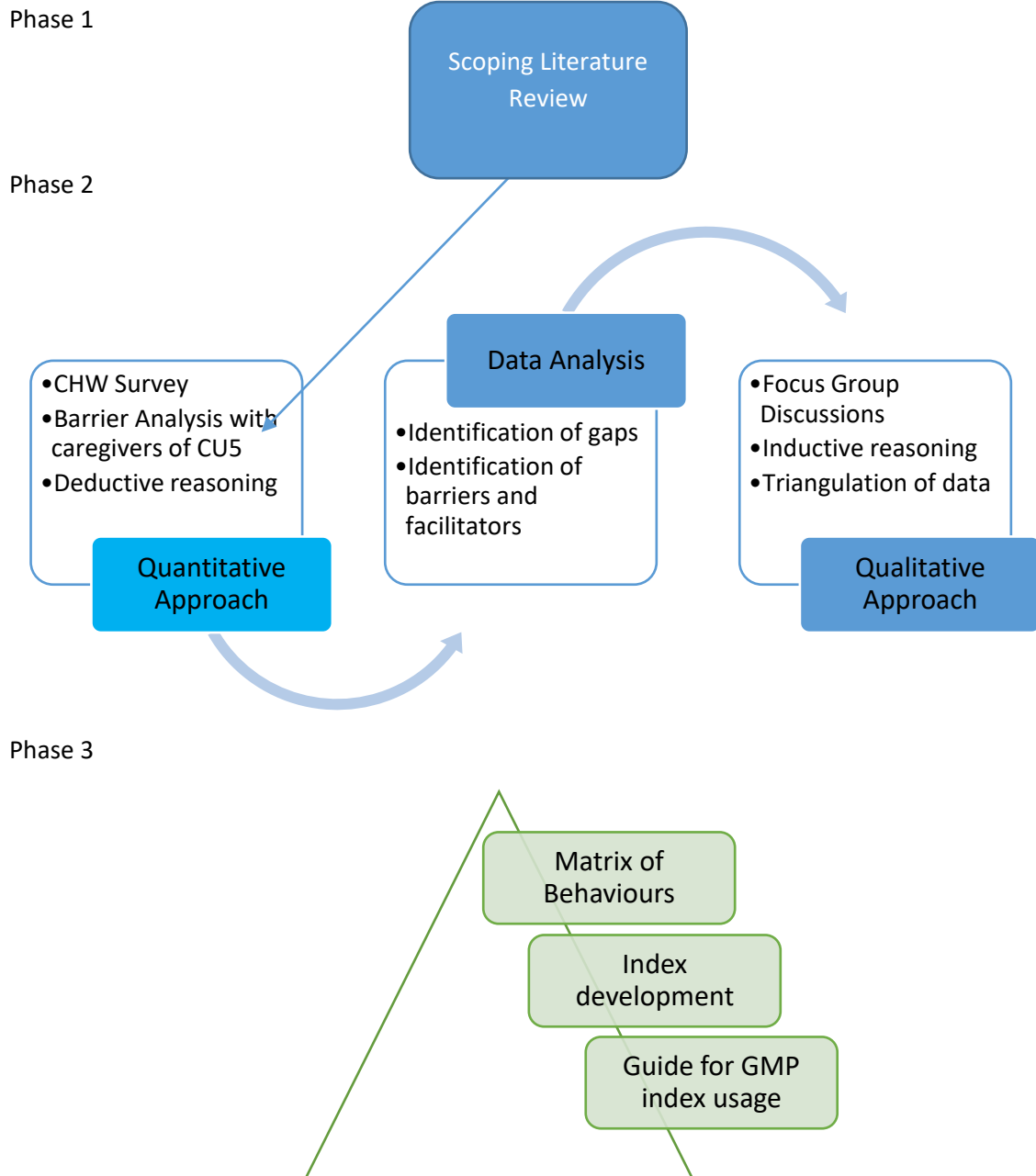


Figure 2: Diagrammatic illustration of the research approach.

2.2 PHASE 1

This phase comprised a scoping literature review. This review targeted both quantitative and qualitative studies published the world over up to December 2021 on GMP activities. The studies were published in peer-reviewed journals or original research and reports found on Google Scholar, Science Direct, PUBMED and EBSCO. A search criterion using selected keywords was used to streamline relevant studies.

Design

A scoping literature review was done. This was to explore the breadth or extent of the available literature, map the evidence and inform future research (Tricco et al., 2016). In this study, the breadth and scope of available literature on GMP activities was explored along with any GMP indexes that had been developed and their contribution to child health.

Review title

Growth Monitoring and Promotion and Index development improved child health: A Scoping Review using Rodgers Concept Analysis Framework.

Review questions

1. What are the gaps for further research on GMP activities?
2. What indexes have been developed towards improving child health through GMP?

Specific objectives

1. To explore and analyse knowledge gaps about GMP activities,
2. To describe key characteristics related to GMP index development.

Search strategy for identification of studies

Keywords aligned to the study objectives were used to search for relevant literature from Science Direct, Google Scholar, EBSCO and PUBMED databases. Reference lists of identified articles were searched for additional sources.

Inclusion criteria

Based on the definition of GMP, the scoping literature review considered all published studies and reports about GMP activities at the community level as conducted by CHWs. The GMP activities were for children under five years of age. These studies were published in peer-reviewed journals the world over up to December 2021, together with unpublished (grey literature) found up to December 2021. The review also targeted quantitative and qualitative research and reports from Science Direct, Google Scholar, EBSCO and PUBMED databases.

Exclusion criteria

This scoping literature review excluded GMP activities done at the primary health facility level and any other GMP activities not conducted by CHWs or equivalent cadres within the health system.

Study selection

Study titles and abstracts were reviewed independently by at least two reviewers to identify and compare studies and reports relevant to this scoping review. Once defined as appropriate, the full articles were reviewed. Any disagreements were solved by consensus. A detailed flow chart using the PRISMA-ScR guidelines shows how articles were selected.

Data extraction/data charting

A data collection form was developed, which was guided by Rodgers' Evolutionary Conceptual Analysis Framework (Rodgers, 2000), to ensure uniformity and quality in the extraction of data from studies that met the inclusion criteria by reviewers. Through the use of this framework, aspects such as the study concepts, context, antecedents, attributes and consequences were assessed. The strength of this framework was that it could contribute to clarifying, describing and explaining concepts by analysing how a chosen concept has been used within the discipline (Tofthagen & Fagerstrom, 2010).

Analysis of the evidence

The results were descriptively mapped. Each reviewer used the data collection form and the results compared and agreed upon. The Rodgers Evolutionary Conceptual Analysis Framework was used to assess the clarity of results regarding further research on GMP activities at the community level and the indexes developed towards improved child health.

Presentation of the results

The data was presented in a chart. The ultimate purpose of charting the data was to identify, characterise and summarise the research evidence and answer the scoping review questions (Nyanchoka et al., 2019).

2.3 PHASE 2

The following were entailed in this phase:

2.3.1 Study design

The design adopted an explanatory sequential mixed method. Using the explanatory sequential mixed-methods design, the researcher intended first to collect quantitative data, conduct data analysis, and identify gaps to be further investigated through a qualitative approach (Creswell, 2014).

2.3.2 Study setting

The study took place in the Umguza district, in Matabeleland North Province of Zimbabwe, in the southwestern part of the country. The district shares its boundary with Bulawayo, the second capital of Zimbabwe. The district had 19 wards, 25 primary healthcare facilities and 186 CHWs. According to the 2012 census, the district had a population of 89,687 people, and of these, 52,5% were male while 47,5% were female. Of this population, the children aged 0 to 59 months were 12,549. The district also had a crude birth rate of 24 and an infant mortality rate of 62 (ZimStat, 2012). According to the national nutrition survey of 2018, the prevalence rate for stunting was 26,9%, wasting was 3,75%, underweight was 9,1%, and overweight was 1,3%.

The population was mostly rural with a very small urban component, and most people were engaged in agriculture-related occupations and cattle rearing as livelihood activities as the district greatly experienced dry weather conditions. Most households were headed by men, and the average household size was 4.7 people (ZimStat, 2012). The culture was predominantly Ndebele.

The district was selected because, according to the DHIS2, in the 12 months of 2020, over 95% of the children under five years were not being taken for GMP monthly. This further indicated that caregivers of these CU5 who were not attending GMP were being missed regarding appropriate health education and counselling relevant to the child's particular health condition.

2.3.3 Study population and sampling

Target population

The target population for this study were all the 186 CHWs in the district and 90 caregivers of CU5 as per standard Barrier Analysis methodology (MOHCC, 2020; Kittle, 2013). The CHWs were volunteers who work within the MOHCC health system, coordinating all health-related activities at the village level, and were conduits into the formal clinic-based care (MOHCC, 2010). The caregivers of children under five years were either birth mothers or legal guardians of children under five years living in Umguza district who also lived with and cared for the children.

2.3.4 Sample and sampling

Quantitative data

A census approach was used to include all the CHWs from the 19 wards. Using a census approach ensured that all CHWs in the Umguza district were interviewed, thus providing accurate information on GMP activities as conducted by all CHWs in the district (Weeks, 2008). The advantage of using a census approach was that all the CHWs were interviewed, and the results indicated the actual activities and experiences of CHWs concerning GMP in the Umguza district. Since the population size for the CHWs in the Umguza district was 186 (MOHCC, 2020), this also translated to the sample size of CHWs. All health facilities in the Umguza district had lists of CHWs, and these were used to identify CHWs and ensure that they were all interviewed.

The second survey was among the caregivers of CU5. This survey followed the Barrier Analysis approach. A barrier analysis is a survey that focuses on identifying what is preventing the target population, i.e., caregivers of CU5, from adopting the behaviour under investigation (Kittle, 2013). The sample size was given as 90 caregivers, where there were 45 individual doers (those who attended GMP monthly) and 45 non-doers (those who did not attend GMP monthly). Since there were 19 wards in Umguza, and 90 caregivers were required, an equal number of caregivers per ward was determined. After that, using GMP registers for the CU5 kept by the CHWs, the caregivers were selected randomly per ward and appointments were made with them through the CHW for data collection at their homes (Kittle, 2014).

Qualitative data

Homogenous, purposive sampling was used to obtain the respondents who were caregivers of CU5 (Perry et al., 2017). It is stated by Gray (2017) that the purpose of purposive homogenous sampling is to describe small homogenous groups in-depth. In this study, the groups were the caregivers of CU5 who had not attended growth monitoring at all six months before the data collection.

A total of ten focus-group discussions (FGDs) with caregivers of children under five years were conducted. These were from purposively selected wards based on the poor performance of GMP statistics according to the DHIS and Barrier analysis survey. Boddy (2016) states that samples in qualitative research can be small and dependent on the context. If the data is properly analysed, a saturation point will be reached when little or no new evidence will be obtained from the discussions. At this point, a larger sample size ceases to contribute to new evidence. Data saturation occurred after interviewing the caregivers, and no further respondents were purposively selected.

2.3.5 Inclusion/exclusion criteria

Quantitative data collection

All the CHWs who resided and volunteered in the Umguza district were included in the study, whilst 90 caregivers of CU5 were also selected for the Barrier analysis survey. The 90 caregivers consisted of 45 caregivers who attended GMP monthly and 45 who did not attend GMP monthly.

Qualitative data collection

The caregivers of CU5 who did not attend GMP monthly and who had not participated consistently for six months before the study were included.

Excluded were other types of community volunteers, such as home based caregivers, community-based facilitators within the Umguza district, and caregivers who had no children less than five years.

2.3.6 Measurement instruments

Quantitative data collection

Structured questionnaires with closed-ended questions were used to collect survey data from the CHWs and caregivers of CU5. According to Polit and Beck (2017), closed-ended questions ensure the comparability of responses among participants and facilitate data analysis. The researcher developed the questionnaires, informed by the findings of the scoping literature review, the study objectives and the conceptual framework Figure 1 by Ashworth et al. (2008), which overall guided the study. The researcher did this with guidance from the academic supervisors. The questionnaire sections included demographical characteristics of the population, GMP activities conducted by CHWs, Knowledge of GMP activities by CHWs and Barriers and facilitators to caregiver GMP attendance (see Appendix 2). The questionnaires were translated from English into Ndebele by a professional translator.

Appointments with the CHWs and caregivers of CU5 were set before data collection dates through the local health facility. Data collection took place within the villages where the respondents reside.

Qualitative data collection

A semi-structured FGD interview guide was used to facilitate the interviews with caregivers of CU5. The questions in these interview guides were open-ended to allow for rich discussions. The questions in the guide were developed after quantitative data analysis and identification of any gaps or areas that needed further probing. FGD interviews allowed the researcher to

gain deeper insight into the identified gaps regarding GMP activities conducted by CHWs and influences of growth monitoring attendance by caregivers.

2.3.7 Pre-test

The data collection tools were pre-tested in Gwanda district, a different district with similar characteristics in terms of poor performance in GMP, according to the DHIS2. A total of ten CHWs and ten caregivers of CU5 were interviewed to test for language and content suitability and make any corrections to the tools, note language translation suitability, and take note of the possible duration of the questionnaire and in-depth interviews. A professional translator translated all data collection tools into the local language of isiNdebele.

2.3.8 Validity and reliability

The following aspects were considered in this study:

Validity of questionnaire

Validity is the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2016). Using experts in the field, the study used face validity. This was done to measure the appropriateness of the questionnaire content by evaluating its relevance to the construct, language clarity and readability and formatting consistency (Trochin, 2015). Revalidation of the tool was then achieved through pre-testing the tools with the CHWs and caregivers of CU5. For revalidation, the questionnaires were confirmed by the survey respondents to be clear, understandable, easy to follow, and consistent format and layout (Yassir, McIntyre & Bearn, 2017).

Reliability of questionnaire

The reliability of a questionnaire refers to the consistency with which participants understand, interpret, and respond to all questions in the questionnaire (Boswell & Cannon, 2015). The questionnaires were reviewed to determine their constructs' reproducibility or repeatability and internal consistency. The Cronbach alpha correlation coefficient was used to assess the internal consistency reliability of the questionnaires, and for this study, the value for alpha was greater 0.8 (Trochin, 2015).

2.3.9 Plan for data collection

Quantitative data was collected first and analysed. After that qualitative data was collected to address any further gaps. Data collection took place in the villages where the caregivers resided. Appointments were set before the FGDs through CHWs. Electronic recording devices were used to record the discussions. The recording allowed the researcher to devote their full attention to listening and probing in-depth. The researcher could also provide an accurate account of the interview capturing the participants' language and tone through field notes.

Field notes were descriptive, written, in-depth accounts of happenings and experiences of the researcher during the research (Krueger & Casey, 2015). Polit and Beck (2016) also indicate that field notes can contain summarised highlights of the researcher and participants' discussion. All the data was transcribed into a notebook and translated into English. After that, the data was typed into a Microsoft word document.

COVID-19 considerations were taken to minimise the risk of exposure to and infection from Covid. The researcher was guided by the Zimbabwe MOHCC Covid-19 guidelines that existed at the time of the data collection. The researcher ensured that all interviews were conducted in an open space that was well-ventilated. Hands were sanitized before the interview, while during interviews, face masks were always worn. A distance of at least 1,5 metres was kept between the research participant and the researcher.

2.3.10 Two-day training for research assistants

The researcher used two research assistants in the quantitative data collection process. A two-day training was held to train on the study concepts, questions in the questionnaires, how to conduct good interviews and who the respondents were. The research assistants should also have some prior training in research ethics. All research assistants were able to speak the local language of isiNdebele. The researcher herself conducted the training.

As the researcher entered the selected district, she set appointments for data collection through the district MOHCC. This method minimised costs associated with travel during data collection processes. Data was collected from research participants, i.e., CHWs and caregivers in the areas where they reside in.

2.3.11 Plan for data management and analysis

This was done as follows:

Quantitative data analysis

The study variables were related to the GMP activities done by the CHWs, e.g. the number of CU5 weighed, and the barriers and facilitators towards GMP by caregivers. The completed questionnaires were coded and captured onto excel and exported to SPSS version 25.0 by the researcher. Multivariate analysis was done, followed by the normalization of the data since the study variables had different measurement units. An ordinal scale was created and used to combine the different variables into an outcome, the GMP index. The data file was stored securely in a password-protected laptop and then analysed for statistical inferences, i.e., multiple linear regression and comparison tests as per study objectives.

Qualitative data analysis

The method chosen for this research was Thematic analysis so as to identify, organize, describe, analyse and report the themes that were derived from this study (Braun & Clarke, 2006). ATLAS.ti, the software, was used to structure and manage the data. This involved entering the data into the software and allowing it to identify the various themes from the data. The researcher was responsible for the initial coding of the data, while the promoters reviewed the codes to identify the emerging themes. Through ATLAS.ti, the code-recode procedures that took place between the researcher and promoters facilitated increased credibility and dependability of the study (Ang et al., 2016). This data was triangulated with findings from the quantitative results as the research sought to answer some of the study objectives and thus contribute towards the findings of the study goal (Noble & Heale, 2019). The results were interpreted, and any arising questions or lessons learnt were noted down, and the study conclusion reached.

2.3.12 Data interpretation

The information from the FGDs was *triangulated* with information from the survey questionnaires. This ensured credibility in allowing a holistic picture of GMP activities as performed by CHWs and underpinned by the conceptual study framework, hence providing detailed and accurate answers to the research questions. Lawlor et al. (2017) support this strategy when they indicated that the best method in obtaining the various divergent constructions of reality within a study was to obtain data on the different events and relationships from different viewpoints. Triangulation was used because it relied on multiple forms of evidence instead of just a single incident or data point in the study.

2.4 PHASE 3

2.4.1 GMP index development

There were three steps in the development of the GMP index, namely: (1) variable selection, (2) examining empirical relationships of variables and combining them into an index, and (3) validating the index. The index was constructed by assigning selected variables scores. The GMP index thus took advantage of any intensity structure among the variables.

Variable selection

The selection of variables was guided by a clear and precise definition of the construct (Spector, 1992). Face validity of the variables was also ensured. Another important aspect considered in the selection of variables was the degree of variation that they provided.

Data synthesis and consolidation

This phase reviewed data analysis of the quantitative data, i.e., the survey with CHWs and barrier analysis (BA) of the caregivers of CU5. The relationships among variables was

considered, with the anticipation of combining items into a single and one-dimensional construct variable. A single composite index was created through the basic summation of items by assigning scores for particular responses on an item. The variables whose p-values were significant were included in computing the index. A defined scale, such as the Likert scale with at least five response categories, was used to quantify and describe the index with regard to how each valid parameter contributed to index formulation.

Validation of the GMP index

This stage incorporated expert healthcare workers within the MOHCC as the GMP index would contribute to classifying GMP activities in a district through the DHIS2 database. The Delphi technique was used as a validation method to validate the GMP index. The Delphi technique is a method whose aim is to develop expert-based judgement about an epistemic question. These experts can draw on various sources of information in making their judgements, such as their expertise and or knowledge from other types of studies (Niederberger & Spranger, 2020). Some of the typical objectives of the Delphi technique have been to develop measurement tools and identify indicators, identify the current state of knowledge on a research topic and formulating recommendations for action and prioritising measures (Han et al, 2012; Van Hasselt, Oud & Loonen, 2015).

As proven by their academic and scholarly background, different health care worker experts were purposively selected. They were briefed on the study findings up to the GMP index development stage. They were tasked with critiquing the identified parameters constituting the index. Their feedback was used to make any necessary revisions to the composition of the index, and after that, guidelines for index usage were developed.

2.5 Ethical considerations

The following ethical considerations were considered in this study:

2.5.1 Ethical clearance

The study proposal and tools were submitted to the Department of Public Health and the School of Public Health for quality assessment. After that, they were submitted to the University of Venda Human Research Ethics Committee for ethical clearance [FHS/21/PH/23/0511] and the Medical Research Council of Zimbabwe ethical approval number MRCZ/A/2877.

2.5.2 Permission to conduct the study

The local level permission was sought in writing from MOHCC at the Provincial level to interview the CHWs and HCWs in the Umguza district.

2.5.3 Voluntary and informed consent

To ensure that all participants voluntarily consented to participate in the study, they were provided with a participant information letter explaining the research's objective. It also clearly explained that they had the right not to participate in the research and should not feel threatened by it (Waltz, Strickland & Lenz, 2017). If they decided to participate in the research, they were asked to sign the informed consent form (see Appendix 1). Each participant was allowed to refuse to participate; hence all participants were ideally willing participants. Participants in the in-depth interviews and focus group discussions were also allowed to consent to have the interviews recorded. The researcher explained to the participants that they could choose to have their interview recorded. To avoid bias created by respondents, the in-depth interviews and focus group discussions involved only those genuinely willing to take part and prepared to offer their information freely (Polit & Beck, 2016).

2.5.4 Privacy and confidentiality

The issue of confidentiality and privacy was upheld in this research. It was explained to the respondents that no respondent identifiers would be captured on field notes except for a pseudonym or a coded identifier. All information that was recorded was for the sole use of this research and nothing else. According to Grove, Gray and Burns (2015), confidential information that the research participants provide must be treated as such by researchers. By participating in the research, the participants would have entrusted the researcher with a lot of private information, and it was the mandate of the researcher to respect and be honourable in keeping to such principles.

2.5.5 Protection from harm

The researcher ensured that no harm would befall the research participants as a direct or indirect consequence of the research (Byrne, 2017). The researcher would take the utmost care in protecting them during data collection. This was protection from either physical or psychological harm or otherwise. All data collected was kept in a locked cabinet whose access was by the researcher, while all typed data was kept on a password-protected computer. This data will be stored for five years. The pseudonyms or coded identifiers that link each participant to their identifier (and, in turn, the participant to their interview transcript) were securely kept by the researcher in a password-protected file and computer. The participant's anonymity was also protected when the study results were written up in journal articles and presented to stakeholders. This ensured anonymity by continuing to use pseudonyms (and removing any identifying information) when quotes were presented in recounting the participants' experiences.

Participants were assured that there would be no adverse consequences to them should they have decided not to participate in the study or decided not to have the interview recorded if they consented to participate.

There were no foreseeable risks of injury or inconveniences that arose from participating in this study, as no form of treatment was involved. All that was required of the participant was to answer questions that were asked. Should such a situation have arisen, they would have been excused from the discussion and referred to the health facility for professional counselling and care.

2.5.6 Objectivity and integrity in research

The researcher will always sought to maintain objectivity and integrity in the research. All limits of the findings that may impaired the validity of these findings were made known (Polit & Beck, 2016). In so doing, the researcher did not alter any obtained data to influence the direction of the research.

2.6 Delimitation of the study

The study occurred in all 19 wards of Umguza district, and all 186 CHWs were interviewed. Umguza district was selected as a district of choice due to its poor performance per DHIS2 growth monitoring data.

2.7 Plan for dissemination and implementation of results

- a) The study results will be published in double-blinded peer-reviewed journals to share with the global audience.
- b) A presentation will be made to MOHCC to share findings and proposal for the adoption of GMP index in the DHIS2.
- c) Meetings will be planned with the Director of Family Health and Nutrition Director within the MOHCC to plan how MOHCC can utilise the results.
- d) Study findings will be presented to UNICEF as a key donor supporting the growth monitoring programme of the MOHCC.
- e) Conference presentations will be made to share the study results.
- f) Presentation of study results will also be made during research days at the university
- g) Meetings will be scheduled with CHWs to share the results of the study and after that will be shared with the 90 caregivers of CU5.

Credit author statement

Shamiso Alice Moyo: *Conceptualisation, Methodology, Formal analysis, Investigation, Resources, Writing original draft, Visualisation, Project administration, Funding acquisition.* **Ntsieni S Mashau:** *Conceptualisation, Visualisation, Writing- Review and editing, Funding acquisition.* **Lufuno Makhado:** *Conceptualisation, Visualisation, Supervision, Reviewing and Editing.*

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Declaration of interests

*Please **tick** the appropriate statement below (please do not delete either statement) and declare any financial interests/personal relationships which may affect your work in the box below.*

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Please declare any financial interests/personal relationships which may be considered as potential competing interests here.

Supplementary material *and/or* additional information [OPTIONAL]

Introduction

Globally, nearly 229 million children under three years were malnourished in 2019. Of these, more than one-quarter of all wasted children lived in Africa (UNICEF, WHO, World Bank Group, 2020). The National Nutrition Survey of 2018 showed that 26,2% of children under five

years in Zimbabwe are stunted. Given these statistics, it is increasingly important to monitor the growth of children to improve child nutrition and detect early any serious underlying conditions (Scherdel et al., 2016). Furthermore, growth monitoring can provide an entry point to preventive and curative health and has also been considered an integral part of programmes associated with significant reductions in malnutrition and mortality among children under five years (Pollifrone et al., 2020).

Background

Growth monitoring (GM), as first conceptualised by Garner, Panpanich and Logan (2000) is elaborated on by Scherdel et al (2016) as being the regular measurement of children's weight and height, plotting the information onto a growth chart, investigating and growth abnormality. This results in the early diagnosis of serious illnesses whose prognosis can be improved through early detection. Growth monitoring is normally conducted by health workers at the health facility level and community health workers within their communities. The element of promotion through counselling by health professionals has been added to GM, making it thus known as growth monitoring and promotion (GMP). This addition improved the caring practices for children under five years (CU5) (Moyo & Mapulanga, 2019).

In various low-income countries worldwide, questions have been raised concerning the efficacy and cost-effectiveness of GMP. The general lack of evidence supporting existing GM practices has also been low (Scherdel et al., 2016). It is; however, important to note that GMP has the potential to alter the child undernutrition landscape as it is a preventive and promotive nutrition activity (Pollifrone et al., 2020).

Growth monitoring has been an important component of child health care in many African countries since the early 1980s, with its importance in helping monitor child growth (Moyo & Mapulanga, 2019). Some challenges faced by growth monitoring programmes have been published in the literature and occur at varying levels, i.e., health facility and community level. In Ethiopia, a qualitative study revealed that some voluntary community health workers (CHWs) reported insufficient skills in accurately measuring children's weight and subsequent recording on the growth chart (Bilal et al., 2014). In Zambia, poor attendance at GMP activities has also come into question, as factors such as access to health facilities and health worker attitudes continue to affect some GMP programmes (Moyo & Mapulanga, 2019). In South Africa, Limpopo province, primary health care nurses mentioned staff shortages, work overload and lack of equipment as affecting GMP activities (Kitenge & Govender, 2013). These challenges have affected the credibility of growth monitoring programmes worldwide. Despite some of these challenges, a study in Lesotho by Seutloali et al. (2018) that sought to explore the lived experiences of CHWs in conducting health promotion activities noted that

when CHWs take children's weights and heights for growth monitoring, health facility nurses can focus on more technical tasks.

In Zimbabwe, GMP is part of the nutritional surveillance system, which aims to serve as an early warning system for child growth and development problems. Acute malnutrition is monitored using the weight-for-age and mid-upper arm circumference (MUAC), while chronic malnutrition is monitored using height-for-age. The community-based growth monitoring programme is carried out at the village level by CHWs, who report the number of children they monitor to the health facility within their catchment area. This data from the health facility filters up to the district as part of the health information system (DHIS). To highlight the problem of inadequate growth monitoring practices by CHWs in Zimbabwe, a comparative process outcome evaluation by Marume et al. (2017) in Mutasa district revealed that more than 73% of children under five years in the district were missed during routine growth monitoring. Simply put, they were not weighed monthly nor did they have their MUAC taken. Because of the extremely high number of children being missed every month, data on growth monitoring could not be meaningfully used to estimate the prevalence of acute malnutrition using the DHIS data (Marume et al., 2017), thereby reducing the usefulness of collected data for timely decision-making.

Information from growth monitoring has several possible uses. The prevalence of acute malnutrition can be estimated to facilitate international comparisons, and provincial variation in the prevalence of undernutrition can be used to target interventions and resources geographically within a country by the government. In addition, trends in prevalence can be examined to assess the impact of droughts or policy changes such as structural adjustments (Wright et al., 2001). Malnutrition contributes 50 to 60 percent of all deaths among children under five years, so child mortality cannot be reduced without addressing the problem of malnutrition. Growth promotion activities are essential and have the potential to achieve many important child survival interventions. Linkages between key preventive and curative health services have been created when GMP programmes have been implemented correctly (Adhikari et al., 2017). Whether there is poor or no growth monitoring, both governments and communities may also lose the conduit and driving force for delivering a package of community-based nutrition, health and poverty reduction interventions.

Besides governments not being able to intervene accordingly, where there is poor or no growth monitoring taking place in communities, CHWs and mothers end up losing a point of reference as to the growth trajectory of the child and the opportunity to intervene before a child's condition deteriorates (Tekle et al., 2019). To illustrate the impact of GMP on child health, a comprehensive review from 1950 onwards assessing the effectiveness of child health

programmes found that education on complementary feeding by CHWs at the community level was found to produce statistically significant improvements in the mean weight and height of CU5 (Freeman et al., 2017).

In Rwanda, a large assessment of CU5 in 15 districts found a reduction in the total CU5 mortality rate by 38% ($p < 0,001$) (Freeman et al., 2017). In the peri-urban community of Epworth in Zimbabwe, outreach work performed by CHWs facilitated the uptake of healthcare interventions, and this helped mitigate the effects of healthcare worker shortages (Taderera, 2019). From the current Ministry of Health and Child Care (MOHCC) growth monitoring programme in Zimbabwe, Marume et al. (2017), having analysed DHIS data, concluded that the growth monitoring system can potentially be used as a surveillance system that provides real-time updates on the stunting rate, thus necessitating timely interventions.

Where community GMP programmes currently exist and there is potential for improvement, it is important to maximise their potential as the impact will be related to CHW performance, among many other factors (Marume et al., 2017). Some of the gaps identified in the literature have been a lack of essential supplies and an unsupportive health system that demotivated CHWs thereby leading to unsatisfactory growth-monitoring practices (Pollifrone et al., 2020). The study in Zimbabwe by Marume et al. (2017), revealed that half of the CHWs had one scale each, implying that those with no scales possibly did not weigh any children monthly, while only 62% of CHWs had a MUAC tape. Despite the limitations that this study was a desk review, the authors recommended conducting research collecting primary data investigating further growth monitoring done by CHWs. The National Nutrition Survey of 2018 acknowledged that the provision of child health services such as growth monitoring was low and that there was a need to strengthen community-based programme delivery for communities through growth monitoring and promotion by CHWs.

In Zimbabwe, there is a paucity of research specifically looking at the growth monitoring of children under five by CHWs in their villages and the barriers and facilitators towards GMP for caregivers of CU5. While the study by Marume et al. (2017) evaluated growth monitoring by CHWs, it was a desk study that only relied on secondary data, thus limiting the conclusiveness of the results. Other studies have delved into the role of CHWs in Zimbabwe; Sanders (1990; 1992) focused on the development of the village health worker (VHW) programme, Gore et al. (2015) looked at the role of VHWs and challenges faced in providing primary health care (PHC), while Kambarami et al. (2016) investigated factors associated with CHW performance. Furthermore, Bilal et al. (2014) from Ethiopia also emphasise the lack of research regarding challenges in the practice of GMP at the grassroots level among those who perform GMP. They highlight the need for investigations in different country contexts.

This study developed a GMP index. This index measured both routine GMP metrics as conducted by CHWs and the barriers and facilitators towards GMP by caregivers of CU5. It is important to understand that both CHWs and caregivers of CU5 are crucial in ensuring the GMP of CU5 and that a comprehensive approach towards GMP should be used to improve child health. The interpretation of GMP data is based on a few indicators from the MOHCC DHIS2 which are heavily skewed towards data collected from CHWs, leaving out the caregivers of CU5. The specific indicators in the DHIS2 are; the number of children under five weighed the number of children under five measured MUAC, (MOHCC, 2020). This approach, when classifying the performance of GMP in districts, has not included behaviour aspects of the caregiver, thereby missing out on why caregivers of CU5 attend or not GMP activities of their children, i.e., caregiver behaviours. From the literature search thus far, no such GMP index exists that combines CHW GMP activities and caregiver behaviours. The study developed an entirely new GMP index to improve child health.

Problem statement

Umguz district has 12,675 children under five years (MOHCC, 2020), and 186 village health workers across 25 primary health facilities. GMP at the community level by CHWs and involves monthly weight and mid-upper arm circumference (MUAC) measurements, subsequent plotting on the child's health card and appropriate health education/counselling for the caregiver relevant to the age of the child. Trend analysis from 2018 to August 2020 from the Umguz DHIS data shows that in 2018, the highest number of children whose weight was measured each month was 439 (3,5%), leaving 96,5% or more children not weighed monthly. In 2019, the highest number of children whose weight was measured in a given month was 313 (2,5%), leaving 97,5% or more children not weighed monthly. In 2020, the highest number of children whose weight was measured in a given month was 387 (3,05%), leaving 96,95% or more children not having been weighed this year (MOHCC, 2020). This also points to the fact that all the caregivers of these CU5 who are not attending GMP are being missed regarding appropriate health education and counselling relevant to the child's particular health condition. There have been no studies done in the district regarding the behaviour of caregivers of CU5 towards GMP activities.

These statistics point to a very big problem for children under five years as their growth is not being monitored timely. Most children are being missed in terms of their routine monthly GMP by CHWs, posing a danger to their health. When GMP is either not done or is delayed, this presents challenges in child health programming. Acute malnutrition, when detected early, enables children to be referred to the health centres early for treatment, but if detected late, it could result in child morbidity and mortality. The absence of timely and accurate information

poses a challenge in the formulation of appropriate health interventions by MOHCC at the district and national levels. The main difficulty in interpreting the nutritional information gathered through the DHIS is that CHWs do not weigh all children. This highlights the increased need to strengthen community-based growth monitoring in the villages (Wright et al., 2001). Furthermore, at the national level, accurate trend analysis of growth monitoring is important in determining the impact of droughts and any other policy changes on child health and nutrition. This enables the government to plan for and allocate resources based on correct information to curb malnutrition. Investing in accurate data from routine growth monitoring of children under five years is cheaper than planning for costly health and nutrition surveys to establish the prevalence of key nutrition indicators such as acute malnutrition.

This study developed a GMP index to improve the quality of GMP activities to support the overall child health and nutrition of CU5 in the Umguza district.

Significance of the study

This study is significant in that it might guide MOHCC on the GMP of children under five years (CU5) while also taking into account caregiver behaviours and, on the other hand, strengthening the performance of CHWs at the community level. It is important to understand why GMP is not being done consistently for years now and how this can be improved and consider caregiver behaviours towards GMP. The GMP index will be computed using data collected and will be a ward or district-level index that can be added to the DHIS2 for additional GMP performance classification.

This study may benefit multiple levels of end-users. The CU5 and caregivers living in the Umguza district might benefit from health promotion activities that meet their varying needs as identified by the different behaviours related to GMP. The health centres may benefit from an easier and more informed method of classification of GMP activities in their wards, as will be informed by the GMP index. The district MOHCC that manages all the CHWs in the district may be able to identify which CHWs need support and in which wards to strengthen the GMP system. They may also be able to come up with more suitable health promotion material for the varying caregiver needs.

At the national level, this study might provide a comprehensive and novel way of classifying GMP activities in the districts using the GMP index, which considers both elements of CHW activities and caregiver behaviours. More appropriate CU5 interventions at the national level can be planned to make better use of resources.

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Section B: Papers/Articles

Growth Monitoring and Promotion and Index development for improved child health: A Scoping Review using Rodgers Concept Analysis Framework.

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SCOPING REVIEW

0.0 Abstract

Purpose

The purpose of this scoping literature review is to explore the breadth of the available literature, and identify knowledge gaps to inform future research using the Rodger's evolutionary concept analysis framework. The literature review also describes the key child indices developed and their characteristics to guide the development of a GMP index for improved child health in Zimbabwe.

Methods

The keywords growth monitoring and promotion, community health workers, caregivers of children under five years, child health indices and index development were used to search for relevant literature from Science Direct, Google Scholar, EBSCO and PUBMED databases in English. The initial electronic database search yielded 535 research articles, and 316 were further assessed for their relevance to the study. An additional 140 articles were excluded from the search as they did not contain adequate evidence per the Rodgers Evolutionary

Framework. After the full-text review, 80 out of 220 articles met the inclusion criteria. Those found to be suitable were 25 articles, thus included in the final analysis.

Results

Key Antecedents: distance and socio-cultural constraints, CHW activeness, participation of fathers in GMP activities, poor understanding and interpretation of growth charts, poor communication between caregivers and CHWs, full vaccination status and complacency; Attributes: education status of parents, knowledge, attitude and practices of caregivers and Consequences: timely health interventions, improved child health outcomes, a platform to promote optimal child health practices of GMP activities were identified.

Conclusion

More research needs to be explored to form indices that incorporate behaviour change metrics. This will increase evidence base to guide the health system, funders and policymakers conclusively.

Key Words: growth monitoring and promotion, antecedents, attributes, consequences, index development, Zimbabwe

1.0 INTRODUCTION

Globally, nearly 229 million children under three years were malnourished in 2019. Of these, over one-quarter of all wasted children lived in Africa [1]. The last National Nutrition survey of 2018 showed that 26,2% of children under five in Zimbabwe were stunted. Given these statistics, it is increasingly important to monitor the growth of children to improve child nutrition and detect early any serious underlying conditions [2]. According to the World Health Organisation [3], growth monitoring and promotion (GMP) is a composite of (1) the routine measurement of a child's weight and height/length; (2) the plotting of the child's measurements and comparison of the child's status to a standardized growth chart to assess growth adequacy; (3) growth-informed counselling; and, if necessary, (4) the undertaking of remedial, health-promoting action.

Implemented properly, GMP programmes have brought linkages to key preventive and curative health services, led to increased knowledge by the family of appropriate infant and young child feeding practices, and provided a platform for early diagnosis and treatment of undernutrition by community health workers (CHWs) [4]. Growth monitoring can provide an entry point to preventive and curative health and has also been considered an integral part of programmes associated with significant reductions in malnutrition and mortality among children under five years [5].

Where community GMP programmes currently exist, and there is potential for improvement, it is important to maximise their potential [6]. Some of the gaps identified in the literature have been a lack of essential supplies and an unsupportive health system that demotivated CHWs, leading to unsatisfactory growth-monitoring practices [5]. A Zimbabwean study [6] revealed that half of the CHWs had one scale each, implying that those with no scales possibly did not weigh any children monthly. In contrast, only 62% of CHWs had Mid-Upper Arm Circumference measuring tapes (MUAC measuring tapes). This highlighted some of the many challenges faced by GMP programmes in communities.

There is, however, a dearth of research in Zimbabwe with regards to GMP activities against a background that the National Nutrition Survey of 2018 acknowledged that the provision of child health services such as growth monitoring was low and there was a need to strengthen community-based programme delivery for communities through improved GMP by CHWs. The CHWs are the link between the health facility and the community and are thus an important element of the health system. It was against this background that this scoping literature review was carried out.

2. PURPOSE

This scoping literature review aimed to explore the breadth of the available literature, identify knowledge gaps to inform future research and describe the key characteristics related to GMP Index development. In this study, the breadth of available literature on GMP activities was explored along with any GMP indexes that have been developed and their contribution towards child health.

3. METHODOLOGY

The following steps were used in this scoping literature review.

Step 1. Defining the Research Questions

In developing the research questions, it was important to take into account the purpose and scope of the review along with the overall study objective of GMP index development ([7], [8]). Against this background, the research questions that were defined through discussions with the study supervisors were:

- 1) What are the gaps for further research on GMP activities?
- 2) What indexes have been developed towards improving child health through GMP?

Step 2. Setting up Inclusion and Exclusion criteria

To ensure that a review is done in an organised way, the researcher set inclusion and exclusion criteria and provided transparency with regard to the strengths and any limitations of the study [9].

Inclusion Criteria: Based on the definition of GMP, this scoping review considered all published studies in English and reports about GMP activities at the community level as conducted by CHWs. The GMP activities were for children under five years of age. There was no restriction based on the location of the study. These studies were published in peer-reviewed journals the world up to April 2022 and unpublished (grey literature) found up to April 2022. The review also targeted both quantitative and qualitative research and reports.

Exclusion Criteria: This scoping literature review excluded GMP activities done at the primary health facility level and any other GMP activities not conducted by CHWs or equivalent cadres within the health system. This is due to the overall study objectives, which looked at GMP activities conducted by CHWs at the community level.

Step 3. Search Strategy

The search strategy combined sets of keywords using AND/OR terms. The keywords growth monitoring and promotion, community health workers, caregivers of children under five years, child health indices and index development were used to search for relevant literature from Science Direct, Google Scholar, EBSCO and PUBMED databases. Reference lists of identified articles were searched for additional sources. The literature obtained was screened for relevance as per the review methods in the following sections.

Methods of review

Study titles and abstracts were reviewed independently by the primary researcher and then shared with the promoters to identify and compare studies and reports relevant to this scoping review. Once defined as relevant, the full articles were reviewed. Disagreements were solved through discussions, and all promoters reached a consensus. A detailed flow chart (Fig 1) below shows the article selection process.

Step 4. Data Extraction and quality review

Rodgers Evolutionary Concept analysis framework

Rodgers' evolutionary concept analysis framework guided this study phase. According to Rodgers, for one to understand concepts clearly, contextual forces influencing a specific idea at a particular point in time need to be understood [10]. Attributes are the characteristics describing a concept that were GMP activities and index development for the study. Antecedents and consequences give context and answer the questions about what has been affecting GMP and any indexes developed towards improving child health. This would thus enable identifying gaps for further research on GMP activities [11].

A data collection form was developed, which was guided by Rodgers' Evolutionary Conceptual Analysis Framework [11], to ensure uniformity and quality in the extraction of data from studies that met the inclusion criteria by reviewers. Through the use of this framework, antecedents, attributes and consequences were assessed. The strength of this framework is that it can contribute to clarifying, describing and explaining GMP activities and index development concepts by analysing how a chosen concept has been used within the discipline [10]. Articles and reports were assessed for clarity in presenting attributes, antecedents, and consequences of GMP activities and index development.

All the selected articles were subjected to the AMSTAR quality assessment tool and met the minimum standards required. These findings are presented in Table 1 below:

Table 1: Methodological quality results from AMSTAR tool

AMSTAR criteria	Response	Action taken
1. Was an 'a priori' design provided?	Yes	Before the scoping literature review, a review protocol was developed.
2. Was there a duplicate study selection and data extraction?	Yes	Three reviewers reviewed articles
3. Was a comprehensive literature search performed?	Yes	Original quantitative and qualitative research articles and reports were obtained from Google Scholar, Science Direct, PUBMED and EBSCO databases.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Yes	This is as per the literature search inclusion criteria.
5. Was a list of studies (included and excluded) provided?	No	This was not supplied but was available on request.
6. Were the characteristics of the included studies provided?	Yes	These are summarised in Table 2 as per three characteristics of Rodger's Evolutionary framework, i.e. antecedents, attributes and consequences.
7. Was the scientific quality of the included studies assessed and documented?	Yes	These were assessed based on the 14-point quality assessment tool and Rodger's Evolutionary Conceptual Framework.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Yes	Included studies were guided by Rodger's Evolutionary framework.
9. Were the methods used to combine the findings of studies appropriate?	N/A	The articles for this review were selected guided by the Rodgers Evolutionary Framework.
10. Was the likelihood of publication bias assessed?	N/A	The review was guided by Rodgers' Evolutionary Concept Analysis framework. The limitations of this Scoping review are highlighted.
11. Was the conflict of interest stated?	Yes	All the authors declared that they had no conflicts of interest.

Step 5. Data analysis, Synthesis and Dissemination of Results

The initial electronic database search yielded 535 research articles, and 316 were further assessed for their relevance to the study. After screening the titles and abstracts, an additional 140 articles were excluded from the search as they did not contain adequate evidence per the Rodgers Evolutionary Framework. After the full-text review, it was agreed on 80 articles out of 220 articles met the inclusion criteria. A total of 25 articles were included in the final analysis, as shown in Fig. (1). The studies included fell within the Rodgers Evolutionary Framework as either being antecedents, attributes or consequences. The results are shown in the PRISMA flow diagram shown below:

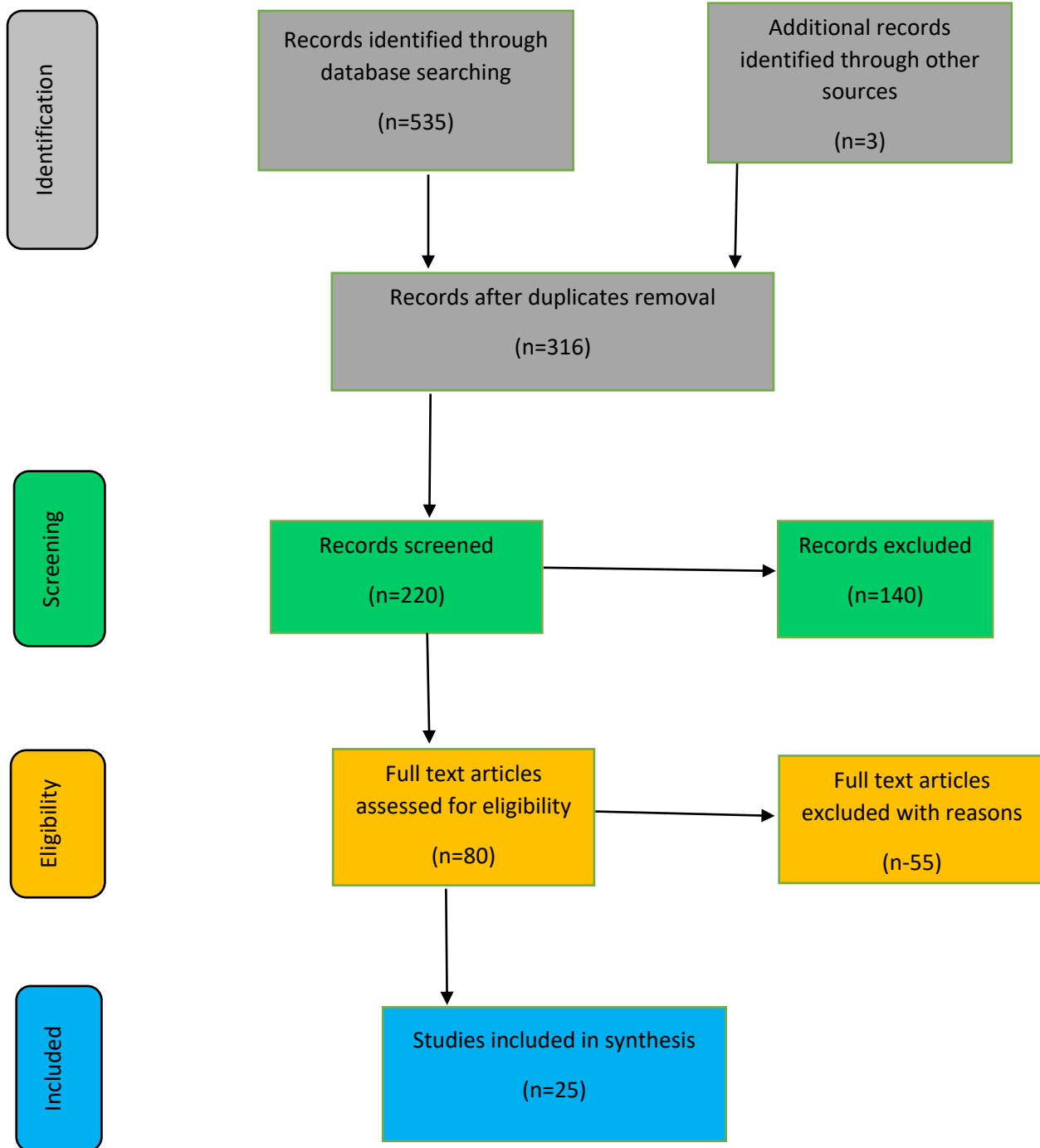


Fig 1: PRISMA diagram

4. RESULTS

4.1. Antecedents

The antecedents found in the literature were distance and socio-cultural constraints, participation of fathers in GMP activities, CHW activeness, poor understanding and interpretation of growth charts, poor communication between caregivers and CHWs and full vaccination status and complacency. These are shown in Table 2.

4.1.1 Distance and socio-cultural constraints

Some studies have noted that in many rural settings, distance deters caregivers from seeking GMP services. Carrying the child long distances, some beyond 10 kilometres, particularly as the child ages, has been expressed as a burden by many mothers. This aspect is further compounded by seasonality, and extreme weather conditions such as heavy rains that result in flooding while on the other hand, mothers are burdened by long hours of agricultural and domestic chores. Due to gendered divisions of labour, mothers were primarily responsible for seeking health care for their children despite whatever workload was on their shoulders [5,12-15].

4.1.2 Participation of fathers in GMP activities

Fathers are the household heads and, in most instances, the financial providers for their families. A few studies have identified that the participation of husbands in GMP activities is low, and many view child health-related education activities as insignificant [16,17,19]. Other studies have noted through discussions with the fathers how they did not perceive it as part of their responsibility to take children to health centres, and without the support of husbands, GMP is unlikely to succeed in some communities [13, 17, 18]. What this means is that if the support from fathers is absent, this may ultimately affect the attendance of GMP by mothers.

4.1.3 CHW activeness

Counselling offered to caregivers during routine GMP activities has been seen to be weak [6, 21-22]. CHWs seem to mainly emphasise weighing the children in the absence of giving counselling based on the child's growth curve [20, 24, 25]. This results in the caregivers not fully understanding their child's growth pattern and whether they are practising the age-appropriate IYCF practices or an improvement needs to be done.

4.1.4 Understanding and interpretation of growth charts

This aspect is both on the part of the caregivers and the CHWs. There is inconsistency by CHWs in performing GMP activities, leading to faulty interpretation of children's growth

patterns, while on the other hand, despite having good knowledge of the purpose of the growth chart; some caregivers are also unable to interpret the growth curves [6, 27, 32, 50].

4.1.5 Communication between caregivers and health workers

The viewpoints of mothers and CHWs are of concern in GMP activities. A few studies have shown that poor communication between mothers and health workers was one of the reasons for a decrease in the use of health facilities and GMP activities. While mothers interpret health concepts from a social standpoint, health workers do so concerning their technical knowledge and this, at times, results in a never-ending standoff between them [33-36].

4.2 Attributes

The attributes of GMP are the independent components of growth monitoring and promotion, which were identified as the parents' education status and the caregivers' knowledge, attitude and practices. These are shown in Table 2 below.

4.2.1 Education status of parents

The educational status of the mother is significantly associated with positive childcare practices, such as improved IYCF practices and routine GMP attendance. A positive influence of the higher educational status of fathers on GMP utilisation has also been noted. This also confirmed that fathers/husbands are indeed very influential regarding decisions for the utilisation of health services [13-15, 38, 49]. Literature has thus shown the importance of parental education to positive child health outcomes.

4.2.2 Knowledge, attitude and practices of caregivers

Caregivers/mothers generally have high knowledge of the child's GMP and its benefits. This does not always translate to the utilisation of available GMP services though some studies have shown that mothers who had adequate knowledge of GM were more likely to utilise GMP than those with inadequate knowledge. The same can be said for the attitude of caregivers as well [13-15, 26, 32, 40, 41].

4.3 Consequences

The consequences identified from the reviewed literature were timely health interventions, improved child health outcomes and a platform to promote optimal child health practices. These are shown along with their literature sources in Table 2.

4.3.1 Timely health interventions

Frequent contact with caregivers of children under five years often leads to strengthening essential nutrition and child health services such as child immunisations. Furthermore, when

caregivers attend GMP activities routinely, it enables timely interventions to be given to a child should they need them. GMP is an opportunity for growth faltering to be identified and the allowance for remedial action to be provided timely [21, 23, 42-43].

4.3.2 Improved child health outcomes

The first two years of a child's life are extremely important. They are a 'critical window of opportunity' during which caregivers can ensure that they practice age-appropriate infant and young child feeding practices to prevent malnutrition. Malnutrition increases the risk of diseases and death, reduces cognitive development and may lead to decreased productivity in later years, with consequences affecting a nation's economic development (Gross Domestic Product). Through routine GMP, child health outcomes have the potential to be improved and thus also saving nations a lot of money used in treating certain conditions that end up developing as a result of malnutrition [13,21,23, 42].

4.3.3 A platform to promote optimal child health practices

The time when a caregiver and health worker interact is very important in a child's life. This interaction is expected to raise awareness and knowledge of appropriate childcare practices, which sometimes leads to improved child healthcare behaviour [21, 22, 44]. Regular GMP increases the frequency of contact between CHWs and mothers while encouraging mothers' use of preventive and curative health services. Increasing time for interaction with caregivers could also improve their knowledge [43]. This is important as it aids in the early detection of preventable diseases, such as measles and polio, which can be prevented through vaccinations.

Table 2: Summary of antecedents, attributes and consequences of GMP activities

Antecedents	Literature Sources	Years studies were published
Distance and socio-cultural constraints	[5,12-14]	2018 – 2021
Participation of fathers in GMP activities	[16-19]	2014 – 2017
CHW activeness	[6, 20-25]	2008 – 2022
Understanding and interpretation of growth charts	[5, 6, 26-32]	2007 – 2022
Communication between caregivers and CHWs	[33-36]	1999 – 2007
Attributes	Literature Sources	Years studies were published
Education status of parents	[13-15, 38, 39, 49]	2005 – 2022
Knowledge, attitude and practices of caregivers	[13-15, 26, 32, 40, 41]	2017 – 2021
Consequences	Literature Sources	Years studies were published
Timely health interventions	[21, 23, 42, 43]	2008 – 2022
Improved child health outcomes	[13, 21, 42]	2008 – 2019
A platform to promote optimal child health practices	[21, 22, 42-44]	2008 – 2021

5. What Indexes have been developed towards improved child health through GMP?

There are some child health and development indexes, namely Weight-for-height (WFH), Height-for-age (HFA), Weight-for-age (WFA) etc., which all provide health practitioners with different inferences. While some of the indices from the literature are location specific, i.e. USA, European Union, and those developed by the World Health Organisation, such as the WHO Growth Standards and are for global use, they all have something in common. Their value resides in providing a measure of the general well-being of populations, formulation of health-related policies and enabling interventions to be planned and monitored [3]. The different indexes identified are shown in Table 3 below:

Table 3: Indexes identified from the literature search

Name of Index	Year developed and by	Specific country used	Objective
Weight-for-height/length (WFH)	2006, WHO	Worldwide	To determine the prevalence of wasting
Height-for-Age (HFA)	2006, WHO	Worldwide	To determine the prevalence of stunting
Weight-for-Age (WFA)	2006, WHO	Worldwide	To determine the prevalence of underweight
Mid Upper Arm Circumference (MUAC)	1950s, Jelliffe	Worldwide	To measure levels of malnutrition
Child Well-being Index	2009, Bradshaw, Hoelscher and Richardson	European Union	Multi-dimensional understanding of child well-being
Child Opportunity Index	2014, Acevedo-Garcia et al	USA	A tool to monitor health equity

From the literature review, it is clear that no existing indices interlink CHW activities and caregiver behaviours towards GMP. The Child Well-being index [46] and the Child Opportunity Index [47] are not very commonly used, whilst the WHO growth Standards only focus on measuring the child's nutrition status. At the same time, no consideration is given towards caregiver behaviours towards GMP.

It is thus imperative that more population-based indices are developed that not only focus on children underfive years but also consider caregiver behaviours. These behaviours encompass any barriers and facilitators towards GMP activities.

6. DISCUSSION

It was noted that there are a plethora of opinions on GMP effectiveness based on the varying types of evidence or a lack thereof, and this has resulted in the quality of GMP itself being questioned [21, 25, 30]. GMP is complex with no 'one size fits all' approach towards an effective way to improve it.

Perhaps looking at the different activities encompassed under GMP, i.e. accurate weight measurements, plotting on the growth chart, interpreting the growth curve, discussing options with caregivers and evaluating the child's response [21], it may be necessary to strengthen caregiver involvement as literature has shown that the GMP attributes, antecedents and consequences have one common denominator i.e. caregivers of the children.

With a new paradigm shift being brought about by the era of Social Behaviour Change (SBC) towards strengthened GMP activities, it is necessary to explore the strong evidence that SBC can improve GMP through locally tailored messaging which is delivered with sufficient coverage, frequency, and salience [42, 45, 48].

This can mean the use of strategies such as formative research to develop robust SBC plans, which include counselling and other communication promoting child growth and development interventions; strengthening community health worker facilitation and counselling capacity with appropriate performance support; and amplifying actions by linking with other sectors providing inputs that enable social and behaviour change [20, 37]. Using growth-outcome data to stimulate collective action and improve community accountability for creating an environment that fosters healthy growth merits attention as part of a strong SBCC plan. The underlying logic is that if growth faltering is detected early and made visible to health workers and families, families can respond by changing their child-care practices [21].

Using different SBC techniques in index development could contribute significantly towards more meaningful GMP indices that combine caregiver behaviours as these are also key in GMP activities.

6.1 Gaps for further research

Based on this scoping literature review on GMP activities, much work remains to be done regarding GMP activities and evidence to support in sub-Saharan Africa. This is despite a lot of efforts in putting GMP programmes in place. There is often little to no effort in setting aside funding for research and publishing what has worked. Information remains grey literature despite the numerous programmatic reports and program evaluations done.

- i) At the output and not outcome level, there is a need to measure the extent to which caregivers affect routine GMP activities and how their poor participation affects child health outcomes.
- ii) There is a need to expand operational research to unpack delivery approaches, targeting, cost-effectiveness and scalability of a more comprehensive and fully inclusive GMP activity model. Among many other aspects, this can involve looking at how fathers' participation impacts GMP activities.
- iii) There is a need for the development of novel indexes which tie together some of the modern approaches/strategies of SBC towards improved child health.
- iv) More GMP Indices need to be developed that use different methodologies to capture barriers and facilitators of caregivers towards GMP Index development.

7. STUDY LIMITATIONS

The findings from different literature sources reviewed were presented according to themes, i.e. attributes, antecedents and consequences and not independently. This then limits the extent to which opinions can be generalised along with possible biases towards themes.

8. CONCLUSION

GMP is complex, and as such, indicators of measurement are rendered complex due to the multi-dimensional nature of factors affecting GMP. Programmes implementing GMP activities need to invest in further research to provide an increased evidence base to guide the health system, funders and policymakers conclusively.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study is part of PhD studies at the University of Venda. Permission to conduct this review was granted by the University of Venda Human Research Ethics Committee (Ethics number: **FHS / 21 / PH / 23/ 0511**) and the Medical Research Council of Zimbabwe ethical approval number MRCZ/A/2877.

CONSENT FOR PUBLICATION

Not Applicable

STANDARDS FOR REPORTING

PRISMA guidelines and Rodgers concept analysis framework

FUNDING:

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Knowledge and performance of growth monitoring and promotion activities by Community Health Workers in Umguza District, Zimbabwe

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See **Appendix 14** for Author Guidelines

Abstract

Background:

Community Health Workers (CHWs) link the community and the health system, ensuring key outreach services to beneficiaries are maintained. In Zimbabwe, they mainly operate at the community level and typically offer a wide range of community-based services, including counselling caregivers on Infant and Young Child Feeding (IYCF).

Design and method:

This study used a census survey approach and interviewed all 186 CHWs. The questionnaire was developed, and the tool was pre-tested in an adjacent district to test for content and language suitability. Appointments were set with CHWs by contacting them on their mobile devices. Consent was sought from study participants. Data were captured and analysed using the Statistical Package of Social Sciences (SPSS) software version 25.

Results:

Almost all CHWs (98.4%) had a weighing scale, while only 55.9% had adequate IEC materials such as IYCF counselling cards. CHWs spend 16 hours per week on various CHW activities and support an average of 26 CU5 each. There was a significant relationship between the

level of knowledge in GMP aspects and the frequency of GMP activities, $X^2 (1, N=186) = 16.412, p= .000$

Conclusion:

The study provided insights into GMP activities in Zimbabwe as conducted by CHWs, the knowledge levels on selected GMP aspects and some best practices. The study adds to the body of knowledge on GMP activities conducted by CHWs in Zimbabwe and possible areas for further research.

Keywords: Community Health Workers, Knowledge, Growth monitoring and promotion, Frequency of activities, Zimbabwe

0.0 Background

Community Health Workers (CHWs) link the community and the health system, ensuring key outreach services to beneficiaries are maintained (1). CHWs are defined as any health worker carrying out healthcare delivery functions. They are trained in some way in the context of the intervention while having no formal professional, paraprofessional or tertiary level qualification (2). It is important to understand the conditions and context within which the CHWs work. This is to better support them in improving their performance (3,4), though in reality, their performance is shaped by many transactional processes between CHWs and their environments (5).

In Zimbabwe, the CHWs are volunteers who do not earn a monthly stipend but are given a quarterly allowance. They mainly operate at the community level and typically offer a wide range of community-based services, including counselling on Infant and Young Child Feeding (IYCF), health education and mobilisation for public health interventions such as vitamin A supplementation campaigns, (6). They carry out growth monitoring and promotion (GMP) as part of the nutritional surveillance system through activities such as monthly weight measurements and plotting on the child health card, MUAC measurements whose outcome may result in them referring a child to the health facility for further management. They are supervised by nurses at their local health facility and have monthly reporting meetings.

GMP is a preventive strategy meant to aid in the early detection of any growth faltering, (7, 8). The data compiled from GMP is very useful in designing interventions and strategies seeking to prevent and reduce malnutrition. Routine growth monitoring statistics from the DHIS show gaps in GM by CHWs in many districts which can be attributed to several factors, among them high workloads, lack of training, knowledge levels and support, poor motivation and so on, (9-11). The exact causes of poor performance among the CHWs need to be fully understood, given the CHWs' important intermediary position between communities and the health system, (12, 13). Against this background, the objectives of the study were:

- To explore the process of GMP within the Umguza district community health system as conducted by CHWs,
- To determine how knowledge of GMP by CHWs translates to a frequency of activities
- To identify sustainable best practices among CHWs consistently conducting GMP activities.

Research questions were:

- What is the process of GMP as conducted by CHWs?
- How does knowledge of GMP by CHWs affect the frequency of activities?

- What are the best practices among those CHWs consistently conducting GMP activities?

2.0 Methods

Study Area

The study was conducted in the Umguza district in Matabeleland North Province. The district has 19 wards, 25 primary healthcare facilities and 186 CHWs. According to the 2022 National census, the district population is 113,265 people, while the average household size is 5.2 family members. The number of children under five years is approximately 15,857, while the prevalence of stunting is 26.9%, according to the last National nutrition survey of 2018.

The population is mixed with both rural and peri-urban. Most people are engaged in agriculture-related occupations, and cattle rearing as the district is affected by dry weather conditions.

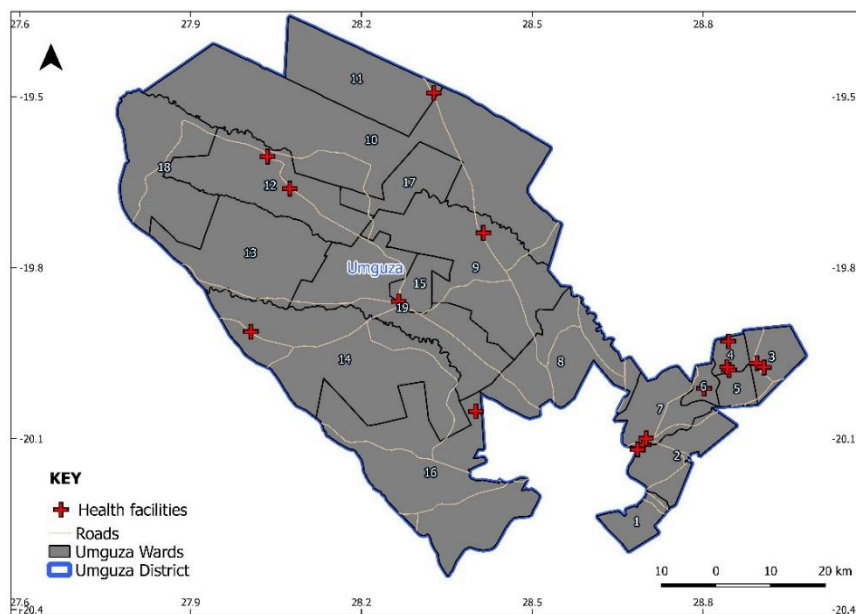


Figure 1: Map of Umguza district

Source: Author adapted map using GIS software

Design, target population and sampling

A census approach included all the 186 CHWs in the district. A database of all CHWs was obtained from the MOHCC district office and used to group the CHWs per health facility. All the CHWs in the Umguza district were interviewed in September 2022.

Data Collection tools and procedures

The questionnaire was developed to capture socio-demographic characteristics, CHW routine GMP activities, and GMP knowledge levels. The questionnaire was shared with a few experts in the field to assess aspects such as relevance to the constructs, language clarity, readability and consistency.

Pre-testing of the tool was done in an adjacent district to test for both content and language suitability. It was confirmed to be clear, understandable, and easy to follow, and this process ensured the revalidation of the tool. Appointments were set with CHWs by contacting them on their mobile devices. Consent was sought from study participants. The questionnaire was administered to the CHWs on different days at each health facility. The internal consistency of the tool was measured using the Cronbach Alpha coefficient in SPSS. For this study, it was found to be 1.000, which indicates a high level of internal consistency.

Data analysis

Data were captured and analysed using the Statistical Package of Social Sciences (SPSS) software version 25. The completed questionnaires were coded and then captured onto excel and exported to SPSS version 25.0 by the researcher. Study variables included CHW socio-demographics, routine GMP activities, and knowledge levels of key GMP aspects. Data were cleaned to remove errors and frequencies, and cross-tabulations and chi-squared tests were run for knowledge of GMP and frequency of GMP activities.

3.0 Results

Socio-Demographic characteristics of the CHWs

All the CHWs participated (n=186) with a 100% response rate. The mean age of the CHWs was 51 years, and 178 (95.7%) of the CHWs were female. More than two-thirds (71%) of the CHWs were monogamously married. The levels of education varied, with 84 (45.2%) having some secondary education, 74 (39.8%) completing their secondary education and only 1 (0.5%) having some college education (Table 1).

Table 1: Socio-demographic characteristics of CHWs

Age in years		
Minimum	29	
Maximum	74	
Mean	51	
Sex		
	N	%
Female	178	95.7
Male	8	4.3

Level of Education

Some primary education	12	6.5
Completed primary education	15	8.1
Some secondary education	84	45.2
Completed secondary education	74	39.8
College Education	1	0.5

Marital Status

Single	8	4.3
Monogamous marriage	132	71
Polygamous marriage	3	1.6
Widowed	35	18.8
Separated/Divorced	8	4.3

Background of working environment

The working environment of the CHWs constituted the number of CU5 supported per CHW, number of villages supported per CHW, distance to the furthest household in the village, number of hours per day spent on CHWs along with the number of hours per week that is also spent on CHW activities. The average distance to the furthest household in the village was 4km, with a high of 20 km. The mean CU5 per CHW was 26, while on average, each CHW spent 1 hour per day and 16 hours per week on CHW activities (Table 2).

Table 2: Background of working environment

	Maximum	Minimum	Mean
Distance to the furthest household in the village (km)	20	1	4
Number of CU5 per CHW	105	1	26
Number of hours/day spent on CHW activities	8	3	1
Number of hours/week spent on CHW activities	40	2	16
Number of villages supported	villages	N	%
	1	133	71.5
	2	29	15.6
	3	19	10.2
	4	4	2.2
	6	1	0.5

Equipment supplies

Almost all CHWs, 183 (98.4%) and 185 (99.5%), had a weighing scale and MUAC tape, respectively. When asked, the majority did not have a functional bicycle 135 (72.6%) and adequate IEC materials 104 (55.9%), such as IYCF counselling cards. They all confirmed that their allowance per quarter was US\$20 – US\$50 (Table 3).

Table 3: Equipment supplies

Do you have a weighing scale?		n	%
	Yes	183	98.4
	No	3	16
<hr/>			
Do you have a MUAC tape?			
	Yes	185	99.5
	No	1	0.5
<hr/>			
Do you have a functional bicycle?			
	Yes	51	27.4
	No	135	72.6
<hr/>			
Do you have adequate IEC materials e.g. IYCF Counselling Cards?			
	Yes	82	44.1
	No	104	55.9
<hr/>			
How much is your allowance per quarter?			
	US\$20-US\$50	186	100

Knowledge level of CHWs on various GMP components

Ten knowledge-based questions were used to assess the knowledge level of CHWs in the district. Out of all variables tested, most CHWs were knowledgeable in them all. The meaning of all the colour codes on the MUAC tape was known by all the CHWs (n=186). The component known by the least number of CHWs was wasting, as only 72.6% knew how to describe/define it (Table 4).

Table 4: Knowledge levels of CHWs on various GMP components

What does the colour Red mean on the MUAC tape?	n	%
Severe malnutrition	186	100
<hr/>		
What does the colour Yellow mean on the MUAC tape?		
Moderate malnutrition	186	100
<hr/>		
What does the colour Green mean on the MUAC tape?		
Not malnourished	186	100

What is exclusive breastfeeding?		
Feeding a baby <6 months with breastmilk only, along with any prescribed medications	186	100
EBF is applicable to which age group?		
0-5 months	182	97.8
7-11 months	2	1.1
12-23 months	2	1.1
What is complementary feeding?		
Feeding a baby from 6 months old with solid or semi-solid food along with breastmilk	184	98.9
Donk know	2	1.1
Complementary feeding is applicable to which age group?		
0-5 months	3	1.6
>6 months	183	98.4
What is oedema?		
Oedema is swelling caused by too much fluid trapped in the body's tissues	185	99.5
Don't know	1	0.5
What is wasting?		
Low weight-for-height	135	72.6
Don't know	51	27.4
What is the recommended frequency for Vitamin A supplementation?		
Twice a year	183	98.4
Monthly	2	1.1
Don't know	1	0.5

Frequency of various GMP components

Only 68.8% of the CHWs conduct weight and MUAC measurements, Vitamin A supplementation, Individual IYCF counselling and IYCF support group meetings monthly (Table 5).

Table 5: Frequency of various GMP activities done monthly

	n	%
Weight measurements	128	68.8

MUAC measurements	128	68.8
Vitamin A supplementation	128	68.8
Individual IYCF counselling	128	68.8
IYCF support group meeting	128	68.8

Knowledge of GMP versus frequency of various GMP components

Each of the ten knowledge about GMP questions (Table 4) was allocated one mark hence the total score being out of ten. The level of knowledge about GMP was then categorised and guided by the mean score, which was 9; thus, high knowledge was 9 out of 10, and low knowledge level was ≤ 8 . GMP activities in this study are those reported in Table 5.

Table 6: Cross-tabulation of knowledge levels and frequency of GMP activities

	Don't conduct GMP activities monthly	Conduct GMP activities monthly	Total	Pearson χ^2 (P-value)
Low level of knowledge	6	7	13	16.412
High level of knowledge	45	128	173	(<.001)
Total	51	135	186	

Based on the results above, there was a significant relationship between the level of knowledge of GMP aspects and the frequency of GMP activities, $X^2 (1, N=186) = 16.412, p < .001$.

4.0 Discussion

The findings from this study clearly show that CHWs in the Umguza district are conducting their monthly GMP activities for CU5. The results were mixed with regards to CHWs having adequate tools of trade-these being weighing scales, MUAC tape, functional bicycles and adequate IEC materials such as IYCF counselling cards. All CHWs were reported to have a MUAC tape and a weighing scale. From a study by Tesfa (7), their results showed that those respondents who had adequate growth monitoring equipment were 3.83 times more likely to practice GMP than those who had inadequate equipment, and this is also similar to other studies conducted in Brazil and Tigray, (14, 15).

Of concern, though, is the CHWs' lack of functional bicycles, as only 27.4% indicated that they had one. Based on the distances to the furthest households mentioned by CHWs in this study of up to 20 km, bicycles ensure that those households living furthest away can be reached by CHWs within their catchment areas. A recent study by Pandya (16), further confirms this notion as the CHWs interviewed noted that the provision of transportation in the form of bicycles or other would certainly help them to work more efficiently, as this would ease their travel to communities, attendance of meetings and the mobilisation of the community.

Only 44.1% of CHWs had adequate IEC materials, such as IYCF counselling cards. Having adequate equipment is key, as this can affect the execution of daily tasks while also negatively affecting the confidence of CHWs in supporting their communities, (7). Furthermore, even communities can perceive those with insufficient tools of the trade as being incompetent. For example, in Ethiopia, CHWs who lacked equipment supplies were sometimes viewed as incompetent by their communities, (17). A study by John (1), also found that a lack of means and opportunity were barriers to CHW performance. This had particular implications for services like nutrition counselling that required high degrees of knowledge and weight measurements that required weighing scales. By 'means', John (1) referred to whether the CHW was capable of performing the task, constituted by knowledge and skills among other factors. In contrast 'opportunity' meant whether the CHW had the chance to perform the behaviour as constituted by workload, resource availability and community among other factors.

Improving the performance of CHWs is complex due to the intersection of many factors that influence their ability and willingness to carry out their tasks (10). Not only does the complexity of CHW performance lie in the multitude of influencing factors, but also in the fact that at the individual level, performance is the sum of different interrelated attributes such as motivation, attitudes, job satisfaction and competence (18). Unfortunately, this study did not explore some of these other influencing factors that influence performance at the individual level.

The payment of CHWs is an essential motivator, contributing to their basic needs. This study found that the CHWs spent, on average, 16 hours per week on various CHW activities, against a quarterly stipend of between 20 and 50US\$. One common recommendation CHWs from the study gave was an increased stipend as it was difficult for them to survive on the meagre amounts. Adequate payments of CHWs are an essential motivator that contributes to meeting the basic needs of both CHWs and their families (19). Several studies support the remuneration of CHWs when they have multiple tasks that require substantial time investments along with being tasks that health professionals formerly do (20). The findings by

Ramukumba (21), revealed how CHWs were not happy with the stipend they received and further complained that despite the low amount, this stipend did not regularly come such that constant follow-ups were required. There are multifaceted reasons why CHWs seek increased remuneration or increased stipends: poverty and the need to provide for their families are some of those reasons; thus this being an aspect that the Ministry of Health and Child Care (MOHCC) should perhaps strive to resolve (22). There is, however, no conclusive evidence in the literature regarding the better option between financial and non-financial incentives (23). Thus, for those designing CHW programmes, different approaches need to be tested to ascertain a balanced mix of incentive types, though perhaps keeping in mind that to optimize CHW programmes, the World Health Organization (WHO) guidelines on health policy and system recommend that CHWs receive a financial package that is commensurate with the demands of their job (24). There have been debates on whether CHWs should be formally integrated into the health system (25, 26). If this was to be done, there would be a need to develop strategies to implement such a change.

While the study revealed the educational level of the CHWs as most attained up to secondary education, it may be a good initiative to consider CHWs with a certain level of education to be sent for primary care nursing (PCN) training as they already have experience working within the health system and this could also help in managing frustrations that come with the non-salaried volunteer role of a CHW. A study by Ramukumba (21) which explored CHWs' views about their role and support in primary health care in South Africa, revealed that CHWs were frustrated about spending many years as volunteers and not moving upward. They believed they had enough experience to be integrated into the health care system formally. The expectation could also be similar for the CHWs in the Umguza district; however, unfortunately, this study did not explore their views on this aspect.

The study revealed a significant relationship between the level of knowledge of GMP aspects and the frequency with which CHWs conducted GMP activities. This finding is consistent with what Tesfa (7) found in their study in Ethiopia, where respondents with good knowledge were 4.60 times more likely to practice growth monitoring than those with poor knowledge. This is also similar to other studies done in Nepal (9), Ghana (8, 27) and Tigray (28). The reason might be that as knowledge is the main base of activities, their high knowledge levels contributed to the frequency of GMP activities, as the study showed that the CHWs had very high knowledge levels based on the scores obtained from tested GMP concepts.

From this study, a best practice identified was the provision of equipment such as weighing scales and MUAC tapes by the MOHCC, as this is crucial in the timely identification and referral of children who are moderately and/or severely wasted.

This study has added to the body of knowledge regarding CHWs and GMP activities in Zimbabwe. From this research, further research is still needed to ascertain their attitudes and experiences as it pertains to their GMP activities. Many studies have focused on CHWs and the work they do. Few studies have examined their lived experiences and identities and how that might influence how they view and perform their roles. This is important as their position within the healthcare system can either break or strengthen the health system. This study was limited by the quantitative research approach, which did not deeply explore the perceptions of the CHWs towards their GMP activities.

5.0 Conclusion

The study provided insights into GMP activities in Zimbabwe as conducted by CHWs, along with showing that CHW knowledge levels are significantly related to how frequently they conduct their activities. The study adds to the body of knowledge on GMP activities as conducted by CHWs in Zimbabwe and points out possible areas for further research and program refinement for the benefit of the CHWs.

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Declaration of conflicting interests

The Author(s) declare(s) that there is no conflict of interest

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Ethical approval

The research received approval from the University of Venda Human and Clinical Trials Research Ethics Committee (HCTREC) clearance number [FHS/21/PH/23/0511] and Medical Research Council of Zimbabwe ethical approval number MRCZ/A/2877. Local-level permission was also sought in writing from the Ministry of Health and Child Care-Provincial and district offices.

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Barriers and Facilitators to growth monitoring and promotion in Umguza District, Zimbabwe: Caregiver perspectives.

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See **Appendix 15** for Author Guidelines

Abstract

Background:

Growth monitoring and promotion provide a platform for preventive and curative health services for children under five years old. This study aimed to identify barriers and facilitators towards Growth Monitoring and Promotion attendance as perceived by caregivers of children under five years.

Methods:

This study used a sequential mixed methods approach through a Barrier Analysis and focus group discussions. Data were collected from caregivers of children under five years in the Umguza district. A standard barrier analysis questionnaire and a focus group discussion guide were used. For the Barrier Analysis, sample size was 90 caregivers, and for the focus group discussions it was 100 caregivers. Analysis was done using the standard Barrier Analysis tabulation sheet in Microsoft Excel and ATLAS.ti. respectively. Significant determinants were measured based on a statistical significance $p < 0.05$.

Results:

Barriers identified were distance to health facilities, time is taken during growth monitoring and promotion activities, transport costs and family support. The identified facilitator was the distance to the health facility.

Conclusion/recommendation:

The results from this study will be used towards developing a Growth Monitoring and Promotion index through the use of those barriers and facilitators identified as significant towards growth monitoring and promotion attendance.

Keywords: Barrier analysis, barriers, facilitators, Growth monitoring and promotion, caregivers' perspectives, Zimbabwe

1. Introduction

Growth monitoring and promotion (GMP) involves the routine measurement of a child's height, weight, Mid-Upper-Arm Circumference (MUAC); health promotion and age-appropriate counselling to caregivers of children under-five (Ashworth., 2008). In the mid-1980s, GMP was envisioned as an activity that empowered caregivers to be able to actively participate in the prevention of malnutrition among their children (UNICEF, 1998).

When implemented correctly, growth monitoring and promotion (GMP) programmes have created key linkages towards preventive and curative health services and have also increased the mothers'/caregivers' knowledge of age-appropriate infant and young child feeding practices (Adhikari et al., 2017; Feleke et al., 2017). Thus far, effective growth-monitoring activities have not been easily implemented, while local realities in national decision-making on GMP programs are often not considered (Ashworth et al., 2008).

In Zimbabwe, GMP activities occur at both the primary health care (PHC) and community levels and are facilitated by nurses and community health workers, respectively (CHWs). These are activities such as weight and MUAC measurements. The primary caregiver, often mothers or grandmothers, are the ones who often attend GMP with their children under five years (CU5), as men tend to take on the provider role through the provision of household income among many other aspects (Moyo & Schaay., 2019). Most primary caregivers are female, as men often leave all the child-related activities to their wives (Bilal et al., 2016; Aubele., 2012).

The barriers affecting GMP occur at different levels from household, community right up to institutional. In a study conducted in Ethiopia by Bilal (2014), they noted that some mothers missed their GMP appointments because they prioritised household activities and social events. One qualitative study also showed that the low attendance of GMP was mainly due to the lack of participation by the caregivers, along with their poor understanding of GMP (Roberfroid et al., 2005). Another study in Zambia identified poor community involvement, lack of health worker support, poor referral systems and suboptimal supervision practices among some of the barriers to GMP (Charlton et al., 2009).

It is plausible to say that an individual's perceptions towards a certain behaviour may ultimately influence how they respond towards it- whether they adopt it or not (Muchiri et al, 2016), as attitudes are one of the factors influencing behaviour change. Perceptions are what form the basis of the determinants of behaviour change outlined in table 1. A study by Mpasha et al., (2022), revealed that negative feelings towards GMP could lead to caregivers missing routine GMP visits, while the opposite could make them utilise GMP services regularly.

In Zimbabwe, while routine GMP data is collected and filtered to the health facility, the barriers and facilitators towards GMP attendance often remain unknown as little research has been done to assess the barriers affecting GMP, more so those affecting caregivers of CU5 directly. The study objective was to determine the barriers and facilitators towards GMP attendance by caregivers of CU5. The research question was – What are the barriers and facilitators towards GMP activities by caregivers of CU5?

2. Methods

Research Design

The study aimed to determine the barriers and facilitators towards GMP attendance by caregivers of CU5. A sequential mixed methods design was used in the study through a Barrier analysis and focus group discussions with caregivers of CU5.

The study used a Barrier Analysis methodology used to determine behavioural determinants associated with particular behaviours in community health and other community development projects (Davis & Thomas., 2004). This tool is based on the Health Belief Model and Theory of reasoned action (Davis & Thomas., 2004; Kittle., 2013).

The behaviour understatement in this study was 'Caregivers of children 0 – 59 months attend monthly GMP activities conducted by their CHWs. GMP was defined as:

- the routine measurement of a child's weight and length/height; the plotting of the child's measurements
- comparison of the child's status to a standardised growth chart to assess growth adequacy;
- growth-informed counselling; and, if necessary, the undertaking of remedial, health-promoting action (WHO., 2006) and caregivers were informed of this definition at the beginning of the interviews.

Population and Sampling

Study participants in the BA constituted both 'doers' and 'non-doers' of GMP. The 'doers' being those caregivers who attend GMP monthly and the 'non-doers' being those caregivers who do not attend GMP at all. The sample size was 45 doers and 45 non-doers as outlined by the standard BA methodology (Davis & Thomas., 2004). The study participants were randomly selected per each health facility until the total of 90 was achieved. Included were caregivers of CU5, while those with children above five years were excluded.

Study participants in the FGDs comprised of non-doers caregivers who had not attended GMP at all six months before the data collection and were from purposively selected wards that were performing poorly in GMP according to the DHIS2. The aim was to delve deeper into issues that affected their attendance of GMP activities. Their sample size was 100 caregivers.

Data Collection

For the BA, data was collected using a standard BA questionnaire with the behaviour statement being- '**Caregivers of children 0-59 months attend monthly GMP activities conducted by the CHWs**'. All interviewed respondents agreed to the verbal and signed the informed consent. The data was collected by the principal investigator in Umguza District in 2022 for a duration of one month.

A total of ten focus-group discussions, each with ten caregivers of CU5, were conducted using a focus group discussion guide.

Instruments

The standard BA questionnaire (Davis & Thomas., 2004) was used with the study behaviour statement- 'Caregivers of children 0-59 months attend monthly GMP activities conducted by CHWs'. This questionnaire per its standard structure (Davis & Thomas., 2004; Kittle., 2013) investigated the following determinants, as shown in table 1:

Table 1: Study determinants of behaviour change

Determinant	Question
Self-Efficacy	Can you do the behaviour?
Perceived Self-Efficacy	What makes it easier? What makes it difficult?
Perceived positive consequences	What are the advantages? What are the disadvantages?
Perceived negative consequences	What are the disadvantages?
Perceived social norms	Who approves?
Perceived social norms	Who disapproves?
Access	How difficult is it to get what you need to do the behaviour?

Cues for Action/Reminders	How difficult is it to remember?
Perceived Severity	How serious is the problem (the behaviour prevents)?
Perceived Action Efficacy	Will doing the behaviour prevent the problem?
Perceived Divine will	Does God approve of you doing the behaviour?

An FGD tool that was guided by the findings from the BA was used to probe further caregiver (non-doer) perspectives of the identified barriers and facilitators towards GMP.

Data analysis

For the BA study, responses were tallied, and data was entered into the BA tabulation sheet in Microsoft excel as designed by Kittle (2013). Upon entering collected data into this sheet, it automatically populates it and shows the results. Results were considered significant if the significance (p-value) was less than 0.05 difference between what the 'doers' and the 'non-doers' said concerning the behaviour in question. Data from the FGDs was transcribed verbatim and entered into ATLAS.ti to show the emergent themes from the study.

3.0 Results

All respondents from both the BA and the FGDs were female. A total of 90 caregivers of CU5 were interviewed through the BA, while a total of 100 caregivers were interviewed through FGDs.

3.1 Significant Determinants

The determinants that were found to be significant in the study were presented. Only the behaviour determinant of Perceived Severity was found to be insignificant and was thus not included in the study results.

3.2 Perceived Self-Efficacy

Self-efficacy refers to the perceptions of the individual regarding their ability to practice the given behaviour (Davis & Thomas., 2004), (The behaviour statement being - Caregivers of CU5 attend monthly GMP activities conducted by their CHWs') given their knowledge, skills and available resources. The things that make it easier and more difficult to attend monthly GMP activities conducted by CHWs were also assessed under this determinant.

Based on their current knowledge, skills and resources, the respondents (doers and non-doers) were asked if they thought they could attend monthly GMP activities conducted by CHWs in their community. Their responses were meant to be either a Yes, No, Maybe or Don't know.

Table 2: Ability to do the behaviour

Question	Significant Response
Can you do the behaviour? 'Caregivers of CU5 attend monthly GMP activities conducted by their CHWs'	<p>Yes: Doers were 5.1 times more likely to give this response (p=0.000)</p> <p>No: Non-doers were 5.5 times more likely to give this response (p=0.013)</p> <p>Don't Know: Non-doers were more likely to give this response (p=0.011)</p>

Table 3: Perceived Self-Efficacy on what would make it easier or difficult

Question	Significant Response
What makes it/what would make it easier for you to attend GMP activities conducted by CHWs	<p>Short Distance to the clinic: Non-doers were 12.3 times more likely to say that a short distance to the clinic would make it easier to attend GMP activities conducted by CHWs (p=0.000)</p> <p>Love for child/child health importance: Doers were 26.3 times more likely that the love for their child and the child's importance to them makes it easier to attend GMP activities conducted by CHWs (p=0.000)</p>
What made it/what would make it difficult for you to attend GMP activities conducted by CHWs	<p>Distance to the clinic: Non-doers were more likely to say that the distance to the clinic made it difficult to attend GMP activities (p=0.000)</p> <p>Nothing: Doers were 14.1 times more likely to say that nothing made it difficult for them to attend GMP activities (p=0.000)</p> <p>Livelihood activities that bring in money for the family: Non-doers were more likely to say that they prioritised</p>

livelihood activities that gave them money for the family
($p=0.000$)

3.3 Perceived Positive and Negative Consequences

Perceived positive consequences are the positive things respondents thought would happen due to attending GMP activities conducted by CHWs. Perceived negative consequences are the negative things respondents thought would happen due to attending GMP activities conducted by CHWs. The following were the significant findings for the two constructs.

Table 4: Advantages and Disadvantages of attending GMP activities

Question	Significant Responses
What are/would be the advantages of attending GMP activities conducted by CHWs in your community (perceived positive consequences)	<p>Know child health status: Doers were 43.4 times more likely to say that knowledge of their child's health status was an advantage from attending GMP activities conducted by CHWs ($p=0.000$)</p> <p>Nutrition counselling and health education: Doers were 12.8 times more likely to say that nutrition counselling and health education was an advantage obtained from attending GMP activities conducted by CHWs ($p=0.000$)</p> <p>Learning from other mothers: Doers were 12.6 times more likely to say that learning from other mothers was an advantage obtained from attending GMP activities conducted by CHWs ($p=0.001$)</p>
What are/would be the disadvantages of attending GMP activities conducted by CHWs in your community (perceived negative consequences)	<p>None: Doers were 17.9 times more likely to say that there was no disadvantage to attending GMP activities conducted by CHWs ($p=0.000$)</p> <p>Time-consuming: Non-doers were 3.8 times more likely to say that the disadvantage of attending GMP activities was that it was time-consuming ($p=0.001$)</p> <p>High Transport costs: Non-doers were 8.5 times more likely to say that high transport costs were a disadvantage of attending GMP activities ($p=0.014$)</p>

3.4 Perceived Social Norms

Perceived social norms referred to the perception that most people important to the respondents thought that he/she should attend/not attend GMP activities conducted by CHWs in their community. Questions on who approves and disapproves of the respondents attending GMP activities conducted by CHWs were assessed under this determinant, as shown in table 5.

The initial assessment examined whether the respondents knew of people who approved/would approve of them attending GMP activities conducted by CHWs in their community. The questions below were asked with the responses:

Table 5: Approval to attending GMP activities

Question	Significant Response
Do most of the people/would most people that you know approve of you attending GMP activities conducted by CHWs in your community?	<p>Yes: Doers were 4.4 times more likely to give this response ($p=0.001$)</p> <p>Felt that most people approved</p> <p>Possibly: Doers were 2.8 times more likely to give this response ($p=0.048$)</p> <p>Don't Know: Doers were 11.4 times more likely to give this response ($p=0.011$)</p> <hr/> <p>Yes: Non-doers were 11.9 times more likely to give this response ($p=0.003$)</p>
Do most people disapprove/would disapprove of you attending GMP activities conducted by CHWs in your community	Felt that most people did not approve.

3.5 Perceived Access

Perceived access includes any real or perceived barriers related to the behaviour. The respondents were asked how difficult it was or would be to attend GMP activities conducted by CHWs in their community and gave the responses in table 6 below:

Table 6: Difficulty in attending GMP activities

Question	Significant Response
How difficult is it/would it be to attend GMP activities conducted by CHWs in your community?	<p>Very difficult: Non-doers were more likely to give this response ($p=0.002$)</p> <p>Not difficult at all: Doers were 2.3 times more likely to give this response ($p=0.034$)</p>

3.6 Perceived Cues for Action/Reminders

Cues for action refer to whether a person can remember to do the behaviour or the steps in doing the behaviour. Respondents were asked how difficult it was (doers) or it would be (non-doers) to remember to attend GMP activities conducted by CHWs in their community. Responses were either Very difficult, Somewhat difficult, Not difficult at all, or Don't know.

Table 7: How difficult it is/would be to remember to attend GMP activities

Question	Significant Response
How difficult is it/would it be to remember to attend GMP activities conducted by CHWs in your community?	<p>Very difficult: Non-doers were more likely to give this response ($p=0.041$)</p> <p>Somewhat difficult: Non-doers are 4.6 more likely to give this response ($p=0.011$)</p> <p>Not difficult at all: Doers were 6.8 times more likely to give this response ($p=0.001$)</p>

3.7 Perceived Divine Will

Perceived Divine Will is the extent to which a person believes that a deity (e.g. Allah or God or the gods) approve or disapproves of him/her doing the behaviour (e.g. attending GMP). This study explored whether respondents believed God approved or disapproved of them attending GMP activities conducted by CHWs and whether respondents believed that if their children were to get malnourished, this would be purely a matter of God's will or chance or something that they could control.

Table 8: Perceived Divine Will

Question	Significant Response
Does God approve of you Attending GMP activities?	<p>God approves: Doers were 406 times more likely to give this response ($p=0.000$)</p> <p>God doesn't approve: Non-doers were more likely to give this response ($p=0.000$)</p> <p>Don't know/won't say: Non-doers were 19.1 times more likely to give this response ($p=0.000$)</p>

3.8 The Emerging Themes investigated through FGDs

The barriers and facilitators identified by the BA were further teased out during the FGDs as to get a more in-depth understanding of how they were affecting the caregivers of CU5. The distance to the health facility, transport costs, lack of family support and time taken during GMP were discussed with the caregivers so as to better understand what was taking place in the community. Table 9 below shows some of the quotes from the caregivers who do not attend GMP.

Table 9: Caregiver perspectives

Barriers	
Distance to health facilities	<p>“Our clinic is quite far, making it difficult to make monthly visits to weigh my son.” <i>Caregiver 2, FGD 4</i></p> <p>“Despite the CHW weighing the children at our usual meeting point, that distance is too far for me.” <i>Caregiver 10, FGD 2</i></p> <p>“Have you ever walked for 2 kilometres on foot with a three-year-old on your back? It’s quite tiresome, I tell you. At times this is what I end up considering during the times that I don’t attend growth monitoring.” <i>Caregiver 1, FGD 7</i></p>
Duration of GMP activities	<p>“There are many competing activities in our daily lives, so at times we end up hesitating the long time that CHWs take during GMP.” <i>Caregiver 8, FGD 1</i></p> <p>“If the children could just be weighed, and we go back home, it would be much easier for us.” <i>Caregiver 7, FGD 5</i></p> <p>“After my child had received all required immunisations, I did not see the necessity of attending growth monitoring every month. The time it takes for the CHW to finish all the processes they do is quite long.” <i>Caregiver 9, FGD 4</i></p>
Transport costs	<p>“High transport costs make it difficult for us to attend GMP activities. I can barely afford food for my family; hence I end up not taking my child to be weighed.” <i>Caregiver 2, FGD 8</i></p>

	<p>"I need at least US\$1 to take a kombi to go to the clinic and back, thus making it hard to always take Cynthia to get weighed. If there were no transport costs involved, I think that I would take my daughter every month." <i>Caregiver 2, FGD 6</i></p>
Lack of Family support	<p>"Our family structures are such that everything falls on the woman, that is, caregiving activities. It becomes hard when say, your mother-in-law or aunts on the husband's side are not supportive of growth monitoring, especially because of their family/cultural beliefs." <i>Caregiver 1, FGD 8</i></p> <p>"As daughters-in-law, we are compelled to abide by 'family rules', and if it is such that every time you want to take the child to the clinic, you end up being bombarded with so many chores, how am I expected to cope?" <i>Caregiver 3, FGD 7</i></p>
Facilitators	
Distance to health facilities	<p>"I feel like if the clinic had been closer to us, I think that more of us would have frequented there with the children." <i>Caregiver 1, FGD 5</i></p> <p>"Perhaps more meeting points with CHWs that are closer to our homes would result in improved attendance." <i>Caregiver 4, FGD 9</i></p>

4.0 Discussion

This study adds to the body of knowledge with regard to the barriers and facilitators affecting caregivers of CU5 towards their GMP attendance. Facilitators towards GMP were cited by doers as the love for their children/importance of their child's health in attending GMP activities. In contrast, the non-doers cited short distances to the clinic as a facilitating factor that would perhaps enable them to attend GMP activities. Studies by Yeshaneh et al., (2021) and Pollifrone et al., (2020) in Ethiopia and Nepal respectively, have identified distance to the health facility/GMP activity point as a contributing factor towards caregiver attendance to GMP activities. Where the GMP outreach facility is close to their homes, attendance has been high. In Zimbabwe, community GMP points manned by CHWs were established to manage distance between communities and the health facility. However, in some communities, the distances are still too high and discourage caregivers from attending routine GMP, especially outside of the child immunisation schedule. From the FGDs, the caregivers also indicated that attending GMP would have been easier if transportation were more accessible. This is also similar to what Pollifrone et al., (2020) found in their study, where distance was a major barrier often prevented mothers from accessing GMP services. It is important to highlight the role that caregiver perception (i.e. health belief) plays, as this seemed to be a predisposing factor to GMP utilisation by the caregivers themselves (Pollifrone et al., 2020). This is because the non-doers perceived that if clinics were nearer and/or transport more accessible, they would attend GMP activities more.

One of the barriers towards GMP was identified by non-doers as being the preference to do livelihood activities that bring in money for the family. This was confirmed during the FGDs where the caregivers indicated that if a livelihood activity competed with their GMP appointment, they would prioritise the livelihood activity as it would be their source of earning a living. This finding is similar to a qualitative study by Bilal et al., (2014) in Ethiopia, where there were always mothers who missed their GMP appointments after prioritising household activities and other social events. The element of household chores on the caregivers also came out. At the same time, some studies in rural Zimbabwe found that women were fully responsible for cleaning, cooking and other household chores (Oxfam., 2019; Graham et al., 2016), while Pollifrone et al. (2020) also add that the long hours of agricultural and domestic work prevented caregivers from attending GMP.

The lack of family support was also a barrier towards GMP attendance by non-doers in the BA study. They felt that most people within their family spheres disapproved of them attending GMP activities. This is similar to other studies in Zimbabwe, Sierra Leone and Pakistan (Moyo et al., 2020; Negin et al., 2016; MacDonald et al., 2019; Zakar et al., 2018) where family

members also influenced some components of GMP e.g. exclusive breastfeeding. Our finding also aligns with Tekle et al., (2019), who explored reasons for low GMP attendance by mothers. They found that mothers expressed different types of influences by their husbands regarding GMP attendance, implying that their husbands were either against, neutral or supportive of GMP attendance. From the FGDs, the caregivers mentioned how pressure from the family structure often affects or contributes towards their non-attendance of GMP activities.

When asked who disapproves of them attending GMP activities, non-doers felt that most people did not approve of them attending GMP activities, and this indicates a greater problem within their family spheres, which upon further probing through FGDs, teased out aspects such as family religion, culture and family matriarchal preferences, and power dynamics which often affect the daughters-in-law as the primary caregivers of their young children.

Non-doers still find it very difficult to remember to attend GMP activities. Social Behaviour Change strategies must focus on message intensity to attend GMP activities strongly. More specifically, on how to help them remember, i.e. cues for action, along with creative ways to encourage their attendance as they find it difficult to attend GMP activities (perceived access). A paper by Sanghvi et al., (2016) comparing four case studies of complementary feeding programs, identified five steps for strengthening behaviour change interventions. The fourth step is quite key, as it encourages the identification of program channels to be intensified and scaled up. Much research into behaviour change models that will work for a community, such as in the Umguza district, must be done.

Zimbabwe has a relatively large Christian population who believe in God as the Almighty. The findings on perceived Divine Will highlight a mixture of perceptions in this regard as doers indicated that God approved. At the same time, non-doers said the opposite regarding attendance of GMP activities. This underscores the role that religious leaders have not only in GMP activities but perhaps in general health programs overall. Religion plays an important role, and thus, Religious leaders are an important target group for any SBC interventions.

The study findings point out that caregivers of CU5 face some barriers that are affecting their routine attendance to GMP activities in their communities. Realistic strategies need to be identified to bridge the existing gap between the community health workers and the caregivers for the ultimate benefit of the CU5.

Recommendations

Strategies need to be put in place so as to reduce the number of barriers hindering caregivers from attending GMP. The objective of GMP for CU5 is a preventive measure along with providing a curative platform to prevent child morbidity and mortality. When caregivers do not

attend GMP, it is children who suffer ultimately. It is thus imperative for policies to be put in place that not only ensure attendance but also address the barriers faced by the caregivers in attending GMP.

Limitations

Despite the study open to both men and women as 'caregivers of CU5', only women participated. This would then make the study seem like it focused on women only, but this was not the case. Further probing of the barriers and facilitators in the FGDs was done with only non-doers; hence perceptions captured in this study exclude the 'doers'.

Conclusion

Much still needs to be learnt from caregivers of CU5 with regards to their behaviours as it relates to their children's health. Certainly, no one-size-fits-all approach can be made through SBC approaches. Still, a multi-pronged approach should delve deeper into realistically addressing the barriers identified herein whilst also leveraging on the enablers as well. The results from this study will be used towards developing a GMP index through the use of those barriers identified as significant and those significant facilitators towards GMP attendance that have been identified.

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Declaration of conflicting interests

The author(s) declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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Ethical approval

The research received approval from the University of Venda Human and Clinical Trials Research Ethics Committee (HCTREC) clearance number [FHS/21/PH/23/0511] and Medical Research Council of Zimbabwe ethical approval number MRCZ/A/2877. Local-level permission was also sought in writing from the Ministry of Health and Child Care-Provincial and district offices.

Significance of study

The study provides insights into GMP through the identified barriers and facilitators that affect caregivers in their attendance. This will enable SBC specialists to be able to design appropriate strategies to improve GMP activities in Zimbabwe.

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Growth Monitoring and Promotion Index development: A novel approach

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See **Appendix 16** for Author Guidelines



Abstract

Background: Growth monitoring and promotion indices are few and currently do not include any metrics that measure caregiver behaviours. No index to date combines the metrics of CHW activeness and caregiver barriers and facilitators towards GMP. This study sought to develop a new growth monitoring and promotion index and validate it using the Delphi Technique.

Methods: The study began with Phase 1, a Scoping review of the literature on GMP indexes. Phase 2 involved a CHW survey which explored the process of GMP within the Umguza health system and determined how knowledge of GMP by CHWs translated to the frequency of activities. A Barrier analysis was also done with caregivers of CU5 to determine the barriers and facilitators towards GMP attendance by caregivers. The Phase 3 was the construction of the index along with its validation using The Delphi Technique, where fifteen experts within the health and nutrition sector were consulted to analyse the constructs/variables of the index.

Results: A growth monitoring and promotion index (GMPI) was developed and validated by several technical experts in Zimbabwe's health and nutrition sector.

Conclusions: A new index has been developed to improve the quality of growth monitoring and promotion activities within the communities.

Keywords: Growth monitoring and promotion Index, barriers, facilitators, Community health workers, Children under five, Zimbabwe

1.0 Background

Growth monitoring and promotion (GMP) is both a preventive and promotive activity that health workers use to monitor the growth of children. It helps prevent child malnutrition through early detection of any growth faltering [1] and reduces the morbidity and mortality of children [2]. The first two years of a child's life, also known as the first 1000 days, are extremely important. These years have been described as a critical 'window of opportunity' meant to ensure appropriate child growth through optimal feeding [3]. If not practiced appropriately in the first 2 years, GMP can make children more prone to malnutrition [4].

In Zimbabwe, GMP is an important part of the nutrition surveillance system, which operates from the national level to the community level [5]. At the community level, GMP is supported by community health workers (CHWs) who serve as the conduits of GMP between the caregivers of children under five (CU5) and the health facilities. The CHWs monitor the nutrition and health status of CU5 through the collection of weights, Mid-Upper-Arm-Circumference (MUAC), age-appropriate nutrition counselling, and vitamin A supplementation, among many other activities. The data collected is submitted using the T-forms to the health facilities and entered into the District Health Information System (DHIS2) [5].

The challenges of GMP are two-pronged, those affecting the CHWs and those affecting the caregivers of CU5 and result in a vicious cycle. On the part of the CHWs, they are meant to be volunteers working for 2-3 half days a week. However, findings by the Zimbabwe Parliamentary Portfolio Committee on Health in 2017 found that the CHWs were now working throughout the week and, at times, working at night. This led to the realisation that they were encountering 40-hour weeks [6]. This certainly has a bearing on the activity levels of CHWs with regard to a full-time role versus a part-time role.

Among some of the challenges faced by caregivers of CU5 is the distance to the GMP site [7]. Generally, caregivers do not want to walk long distances to seek health care services. This was noted as a barrier towards GMP attendance [8], and such barriers create negative attitudes towards attendance to GMP by caregivers. A study done by Mphasha et al., [9] in Polokwane, South Africa, explored the perspectives of caregivers towards GMP. They concluded that the inconsistent availability of GMP services affected caregiver attendance at

GMP. This then points back to the CHWs and the challenges they face, hence the vicious cycle affecting the overall quality of GMP.

From the protocol by Moyo et al., [10], a data challenge in the Umguzu district was identified where CHWs were not compiling GMP statistics. This rendered the quality of the data-poor and not useful. Furthermore, what exists in the DHIS2 are indicators such as 'the number of children weighed', which do not tell us about the quality of GMP activities. By quality, we refer to aspects of whether caregivers of CU5 attended GMP in the first place, along with any barriers or facilitators they may face concerning GMP. Some studies have even shown that healthcare workers mainly emphasised weighing the children's weight in the absence of counselling for mothers/caregivers on children's feeding based on the growth curve [11], and other studies conducted on GMP practice reported that counselling offered to mothers/caregivers during GMP service is weak [12, 13]. These examples illustrate how important it is to consider other GMP elements in determining the quality and overall classification of GMP activities within a community.

In the build-up to the GMP Index (GMPI), literature was reviewed that highlighted a gap concerning the types and number of child health indexes currently existing. No index combines the metrics of both CHW performance and caregiver barriers and facilitators towards GMP [8]. Against this background, this research sought to construct a GMPI and validate its construction.

2.0 Methodology

The study was conducted in three phases, where Phase 1 was a Scoping Literature Review, Phase 2, a CHW survey and Barrier Analysis and Phase 3, the index development.

2.1 Phase 1

The objectives of phase 1 were to explore and analyse knowledge gaps about GMP activities and describe key characteristics related to GMP index development. To investigate these, a scoping literature review was done using the Rodgers Concept Analysis Framework and identified antecedents, attributes and consequences of GMP activities worldwide. The review included peer reviewed and published quantitative and qualitative studies about GMP activities up to April 2022. Excluded were GMP activities conducted at the primary health facilities. The AMSTAR tool was used for quality checks. A total of 535 articles were selected and only 316 were found to be relevant to the study. 80 articles met the inclusion criteria, and only 25 were included in the final analysis.

2.2 Phase 2

The objectives of phase 2 were to explore the process of GMP within the Umguza health system as conducted by CHWs; to determine how knowledge of growth monitoring and promotion by CHWs translates to a frequency of activities; to determine the barriers and facilitators towards GMP attendance by caregivers of CU5 and to identify sustainable best practices among CHWs consistently conducting growth monitoring and promotion activities. To achieve these, this phase used a sequential mixed-methods design. A CHW survey was done initially, where a census of all 186 CHWs in Umguza district were interviewed. The survey, being quantitative in nature used a questionnaire to collect data which was then analysed with SPSS version 25. Ethical considerations were Justice, beneficence, confidentiality and anonymity.

A barrier analysis then followed with the target population of the caregivers of CU5. The BA was both explorative and descriptive and based on the Health Belief Model and Theory of Reasoned Action. Included were 45 caregivers of CU5 who attend GMP monthly (doers), and 45 caregivers of CU5 who do not attend monthly GMP (non-doers) to make a total of 90 caregivers. The standard BA questionnaire was used to collect the data, while the standard BA tabulation sheet was used for data analysis. From the results obtained, focus group discussions were held with caregivers of CU5 who do not attend monthly GMP activities. Data collected was transcribed verbatim and analysed using ATLAS.ti.

2.3 Phase 3

The objectives of phase 3 were to construct a GMP index along with guidelines for its usage and to test and validate the GMP index. The GMP index development process was thus done in three steps, i.e. (1) variable selection, (2) examining empirical relationships of the variables and after that combining them into an index and (3) index validation.

2.3.1 Step 1: Variable selection

From the scoping literature review results, the antecedent- CHW activeness, the attribute-knowledge, attitude and practices of caregivers and the consequence of improved child health outcomes were identified as important with regards to GMP activities. Literature also showed how they all had a direct effect on GMP activities. Having investigated these aspects during phase 2, it was thus necessary to relate them to the index in the form of an equation. The starting point was defining the index and how it was a function of its variables.

In this study, the GMP index (GMPI) was defined as the quality of GMP activities as conducted by CHWs. It is a function of CHW activeness, the magnitude of caregiver barriers to GMP and the magnitude of caregiver facilitators towards GMP. The barriers are impediments and weigh down the index. In linking the variables into one, an equation was developed by the principal

investigator. It illustrated GMPI as a sum of its variables because the variables of CHW activeness, magnitude of barriers to GMP and magnitude of facilitators to GMP directly affect the GMPI. The equation was thus set as follows:

GMPI = X+Y-Z where variables;

X = CHW activeness

Y = Caregiver facilitators of GMP

Z = Caregiver barriers to GMP

The variables X, Y and Z were determined as outlined below:

X (CHW activeness)

CHW activeness was defined as the number of hours per week spent on the various CHW activities by the CHWs (CHW activities in their broad sense and not entirely aligned to GMP activities).

Y (Caregiver facilitators of GMP)

Facilitators are any entity that can help a person adopt and practice a specific behaviour. The variable Y was thus defined as the magnitude of facilitators identified. It has a positive effect on the GMPI as it improves the quality of GMP activities.

Z (Caregiver barriers to GMP)

Barriers were defined as hindrances preventing a person from adopting and practising a specific behaviour. The variable Z was thus defined as the magnitude of barriers identified. It has a negative effect on the GMPI as the barriers are obstructions that hinder the implementation of quality GMP activities.

2.3.2 Step 2: Examination of empirical relationships among variables and combining them into an index

During this step, a review of the data analysis from the CHW survey and Barrier Analysis of the caregivers of CU5 was done.

CHW Activeness (X)

The objectives of the CHW survey were to explore the process of GMP in the Umguza district as conducted by CHWs as well as determine how knowledge of GMP translated to the frequency of their activities. The survey found a significant relationship between the level of knowledge of GMP aspects and the frequency of GMP activities. The CHW survey also assessed the number of hours per week that the CHWs work, and this was selected as a measure of how active they were, hence variable X, i.e. CHW activeness. The hours per week ranged from a low of 2 hours to a high of 40 hours and a mean of 16.99 hours. The question to the CHW read: How many hours per week are spent on CHW activities? A five-point Likert scale was then created to classify the different levels/types of CHW activeness as follows, least active (0-8hrs); somewhat active (9-16hrs); active (17-24hrs); very active (25-32hrs) and most active (33-40hrs) [14].

Caregiver facilitators (Y) and barriers (Z) to GMP

The Barrier Analysis (BA) was done to identify the barriers and facilitators towards GMP affecting CHWs [15]. The methodology utilises the BA questionnaire administered to caregivers of CU5 (45 doers and 45 non doers), and analysis was then done using the BA Analysis sheet. Those factors that were identified with p values of $<.05$ were included as the key barriers and facilitators [15]. From a meta-analysis by Carpenter, [16] and a study by Orji et al., [17] which served as an extension to the Health Belief Model, it was seen that barriers emerged as the strongest predictors of behaviour, influencing the likelihood of an individual performing the targeted behaviour. It can thus be seen how much they affect the adoption of behaviours. From this study, four barriers were identified as distance to health facilities, time taken during GMP activities, transport costs and family support, whilst distance to health facilities was the only identified facilitator and made up variables Z and Y, respectively.

Against this inductive reasoning, the most suitable approach was deemed as being the use of the Likert scales so as to be able to merge the variables X, Y and Z into a GMPI. The method was kept simple to be easily replicated at the program implementation or district level where the DHIS2 database is managed.

Likert scales were used for all three variables X, Y and Z (tables 3, 4 and 5 respectively) and developed to classify each variable and quantify the GMPI itself.

2.3.3 Step 3: Validation of the index using the Delphi Technique

The Delphi Technique was used in validating the GMPI. It is a cross-examination process aiming to obtain expert-based judgements about a topic of interest from experts [18-20]. The experts could draw on their experience within the health sector and/or knowledge from other

types of studies and captured their collective opinion and enhanced the overall quality of the GMPI [19].

The experts were purposively drawn from various backgrounds covering Academia, the Ministry of Health and Child Care (National, Provincial and district levels), Policy Development, Nutrition Program Management Specialists and SBC Specialists. They were selected because they would be able to provide rich insights and critique the newly developed GMPI. They were tasked with critiquing the variables identified that constitute the GMPI. A total of fifteen experts participated, as shown below:

Table 1: Technical experts in the Delphi Consultations

Type of Expert	Number
Academia	3
MOHCC	3
Policy development	3
Nutrition Program Management Specialist	3
SBC Specialist	3
Total	15

The opinions of the 15 experts were captured and are collectively outlined in the results section below.

2.3.4 Guidelines for GMPI usage

The guidelines for using the GMPI were developed to guide GMP implementors on how to use the GMPI in their wards or districts. They outlined the variables in the GMPI, i.e. the source of the data and how they are measured. They are shown in the results section below.

3.0 Results

The GMPI itself is a culmination of phases 1 and 2, as outlined by the summary of the findings from phases 1 and 2 (table 2) and the final development in phase 3. The variables though seemingly different, are interconnected through the caregivers of CU5, CHWs and GMP for CU5.

Table 2: Summary of merged findings

Findings from Scoping Literature review	Findings from the CHW survey	Findings from Barrier Analysis with caregivers of CU5	Findings from the merged analysis
<p>Antecedent factors</p> <ul style="list-style-type: none"> -Distance and socio-cultural constraints -CHW activeness -Participation of fathers in GMP activities -Poor understanding and interpretation of growth charts -Poor communication between caregivers and CHWs -Full vaccination status and complacency <p>Attributes</p> <ul style="list-style-type: none"> -Education status of parents, knowledge, -Attitude and practices of caregivers <p>Consequences</p> <ul style="list-style-type: none"> -Timely health interventions, improved child health outcomes, -A platform to promote optimal child health practices of GMP activities <p>Characteristics of index development</p> <p>From the review of literature, it is clear that there are no existing indices that interlink CHW activities and caregiver behaviours towards GMP</p>	<p>Frequency of GMP activities</p> <ul style="list-style-type: none"> -68.8% of CHWs conduct GMP activities monthly <p>Background or working environment</p> <ul style="list-style-type: none"> -98.4% had a weighing scale -55.9% had adequate IEC materials such as IYCF counselling cards. -Spend an average of 16 hours per week on various CHW activities -Support an average of 26 children under five years. <p>Relationship between knowledge of GMP and frequency of activities</p> <ul style="list-style-type: none"> -There was a significant relationship between the level of knowledge in GMP aspects and the frequency of GMP activities, $\chi^2 (1, N=186) = 16.412, p=.000$ 	<p>Barriers</p> <ul style="list-style-type: none"> -Distance to health facilities -Time taken during GMP activities -Transport costs -Family support <p>Facilitators</p> <ul style="list-style-type: none"> -Distance to health facilities 	<p>In this study, the GMP index (GMPI) was defined as the quality of GMP activities.</p> <p>The Antecedent factor of CHW activeness was explored further through the CHW survey and constituted variable X of the GMPI.</p> <p>The Attribute of attitude and practices of caregivers was explored more in-depth through the barrier analysis and identified four barriers and one facilitator of caregivers towards GMP attendance and thus constituted variables Y and Z, respectively.</p>

Variable X: CHW activeness

Using a five-point Likert scale, scores were assigned for each level of CHW activeness, with the Least active being assigned the lowest score of 1 and the Most active being assigned a score of 5. This meant the maximum score attained could only be 5 points for CHW Activeness. Table 3 shows that almost half of the CHWs were Moderately active, with only 35.5% of the CHWs being classified as Active.

Table 3: CHW activeness

CHW Activeness	Frequency	%	Scores
Least Active (0-8hrs per week)	12	6.5	1
Moderately Active (9-16hrs per week)	89	47.8	2
Active (17-24hrs per week)	66	35.5	3
Very Active (25-32hrs per week)	14	7.5	4
Most Active (33-40hrs per week)	5	2.7	5

To come up with a single score for all the CHWs, a weighted average score was used, i.e. (frequency x scores)/n.

The calculation thus follows: $[(12 \times 1) + (89 \times 2) + (66 \times 3) + (14 \times 4) + (5 \times 5)] / 186 = 2.52$ (2 decimal places)

The level of CHW Activeness for this study is, therefore, **2.5**

Variable Y: Caregiver Facilitators of GMP

A three-point Likert scale was developed to classify the magnitude of facilitators of GMP (table 2) identified from the Barrier Analysis. The ideal situation is that the presence of many

facilitators creates an enabling environment for the caregivers of CU5 to attend GMP. The more the facilitators, the higher the score on the Likert scale. A maximum score of 3 points was allocated for four or more facilitators based on the logic that the existence of many facilitators acts as a push towards GMP attendance. In contrast, the lowest score of 1 point was allocated for one or fewer facilitators. This is shown in table 4 below:

Table 4: Facilitators of GMP

Number of facilitators	Classification	Score
4 or more	Many	3
2 to 3	Moderate	2
1 or less	Few	1

This study identified one facilitator; hence the overall score for variable Y is **1**

Variable Z: Caregiver Barriers to GMP

A three-point Likert scale was developed to classify the magnitude of the barriers identified in this study (table 2) towards GMP from the Barrier Analysis. Based on the definition of barriers, there were many hindrances to GMP in the Umguza district, and this is not a desirable situation. Hence, the more barriers, the less the caregivers will attend GMP activities. This variable weighs down on GMP activities and is represented as negative on the equation. A score of 3 points was allocated for 4 or more barriers, while the score of 1 point was allocated for 1 or less barriers as shown in table 5 below:

Table 5: Barriers towards GMP

Number of barriers	Classification	Score
4 or more	Many	3
2 to 3	Moderate	2
1 or less	Few	1

Therefore, this study identified four barriers; hence overall score for variable Z is **3**

GMPI for Umguza district

From the equation developed from this study, $GMPI = X+Y-Z$, the maximum value of the GMPI is attained when:

- i. CHW Activeness (X) is classified as Most Active (table 3) and score is 5
- ii. Caregiver facilitators of GMP (Y) are Many (table 4) and score is 3 and,
- iii. Caregiver barriers to GMP (Z) are Few (table 5) and score is 1.

The maximum GMPI score is 7 from the formula calculation $[5+3-1]$

The minimum value of the GMPI is attained when:

- iv. CHW Activeness (X) is classified as Least Active (table 3)
- v. Caregiver facilitators of GMP (Y) are Few (table 4),
- vi. Caregiver barriers to GMP (Z) are Many (table 5).

For the classification of the GMPI, a three point Likert scale was developed where each threshold was weighted equally to one decimal place [14] i.e Low (0 - 2.3); Medium (2.4 – 4.7) and High (4.8 - 7) so as to be able to fully classify the GMPI as shown in table 6.

Table 6: GMPI Thresholds

Threshold	0 – 2.3	2.4 – 4.7	4.8 - 7
Classification	Low	Medium	High

From the results of this study, the GMPI, based on the equation $GMPI = X+Y-Z$ where the variables have been outlined above as;

X = 2.5, CHW Activeness

Y = 1, Caregiver facilitators of GMP

Z = 3, Caregiver barriers to GMP

The **GMPI = 0.5** $[2.5+1-3]$

According to this study, GMPI index is a measure of the quality of GMP activities and thus follows; The highest quality of GMP activities exist within a district or community when there are

- **Few** barriers (Z),
- **Many** facilitators (Y),
- **Most Active** CHWs (X),

Based on the GMPI score above, the quality of GMP activities in the Umguza district were found to be of **Low** quality.

Validation of the GMPI

An analysis of opinions from the technical experts is shown in figure 1 below:

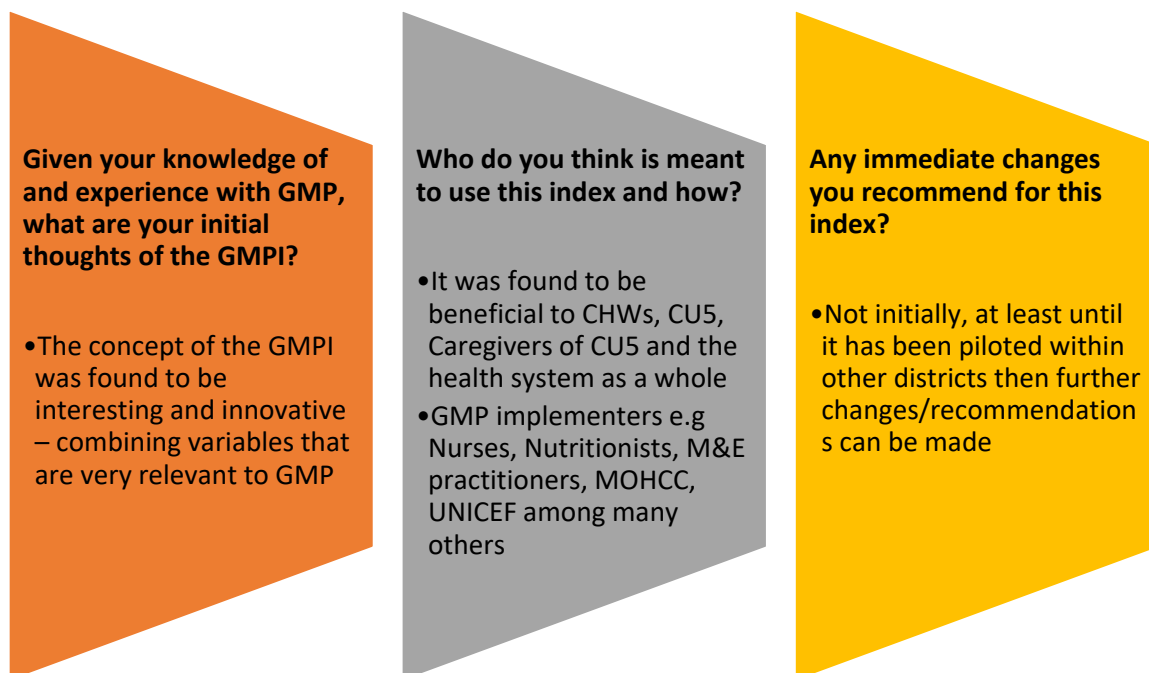


Figure 1: Opinions of Technical experts from the validation exercise

Based on the GMPI validation exercise, it was agreed that no immediate changes were to be made to the new GMPI index. Recommendations were that the GMPI be tried out by the MOHCC and other implementors of GMP programs to ascertain its usability.

Guidelines on usage of the GMPI

- The GMPI can be used by all implementors of GMP at either district or ward level
- It is best to use the GMPI initially, when the routine GMP data indicates a low number of CU5 being assessed during GMP by CHWs. Such data can be obtained from the DHIS2.

C. In order to use the GMPI, the different variables that constitute it have to be measured. Their measurement is outlined below:

I. CHW Activeness (X)

This is measured through a census of all CHWs in the ward or district. A questionnaire should be designed to include among other desired aspects, the number of hours volunteered by the CHWs per week. Once data is obtained, analysis can be done using SPSS or STATA and thereafter refer to table below:

CHW Activeness	Score
Least active 0-8 hrs	1
Moderately active 9-16 hrs	2
Active 17-24 hrs	3
Very active 25-32 hrs	4
Most active 33-40 hrs	5

In order to come up with a single score for all the CHWs, a weighted average score was should be used (frequency x scores)/n.

II. Caregiver facilitators of GMP (Y)

A standard Barrier Analysis as developed by Kittle [15] is done to identify the number of facilitators affecting caregivers of CU5 within the ward or district. Once the number is identified, it is classified according to the table below:

Number of Facilitators	Classification	Score
4 or more	Many	3
2 to 3	Moderate	2
1 or less	Few	1

III. Caregiver barriers of GMP (Z)

A standard Barrier Analysis as developed by Kittle [15] is done to identify the number of barriers affecting caregivers of CU5 within the ward or district. Once the number is identified, it is classified according to the table below:

Number of barriers	Classification	Score
4 or more	Many	3
2 to 3	Moderate	2
1 or less	Few	1

D. Classification using the GMPI

From the study, GMPI is the sum of $X+Y-Z$

Threshold	0 – 2.3	2.4 – 4.7	4.8 – 7
Classification	Low	Medium	High

Hence based on the total sum of the three variables, the GMPI will be found and classified as to whether it is low, medium or High.

High: Implies that GMP activities as shown by the variables are performing well

Medium: Implies that one or more of the variables is performing poorly and specific strategies to improve them need to be done

Low: Implies that two or more of the variables are performing poorly and specific strategies to improve them need to be done.

5.0 Discussion

Having defined the GMPI as a measure of the quality of GMP activities has enabled GMP implementers to move away from the usual and somewhat rhetoric classifications based on current child health indexes such as weight-for-height etc. In the DHIS2, one of the indicators reflective of GMP is the number of children weighed per month and so on. Caregivers of CU5, being the ones who attend GMP, also needed to play a part in determining the quality of GMP activities in their communities. Evidence suggests that implementing growth monitoring without linking it to the promotion aspect of GMP is a waste of resources and a loss of opportunities [20]. That being the case, it can also be said that classifying GMP without

including caregiver barriers and enablers of GMP results in a waste of resources and missed opportunities to improve the quality of GMP activities.

The construction of the GMPI was guided by the conceptual framework by Ashworth et al., [13] and adapted for this study, as shown by Moyo et al., [10] in their protocol paper. Based on the results of this study, a new conceptual framework for the GMPI is illustrated below (figure 2). For the Umguza district, the conceptual framework outlines the actual caregiver barriers that weigh down the GMPI, while the caregiver facilitators push it up. CHW activeness has a direct effect on the GMPI, while GMP activities have an effect and are also affected by the GMPI. All variables directly impact GMP activities and ultimately affect the child health and nutrition status of CU5. When CHWs are active and caregivers attend GMP activities, this means that the health and nutrition of the CU5 is being monitored routinely, hence both preventive and curative measures can be done in a timely manner through improved GMP. This can ultimately result in improved child health and nutrition status of CU5.

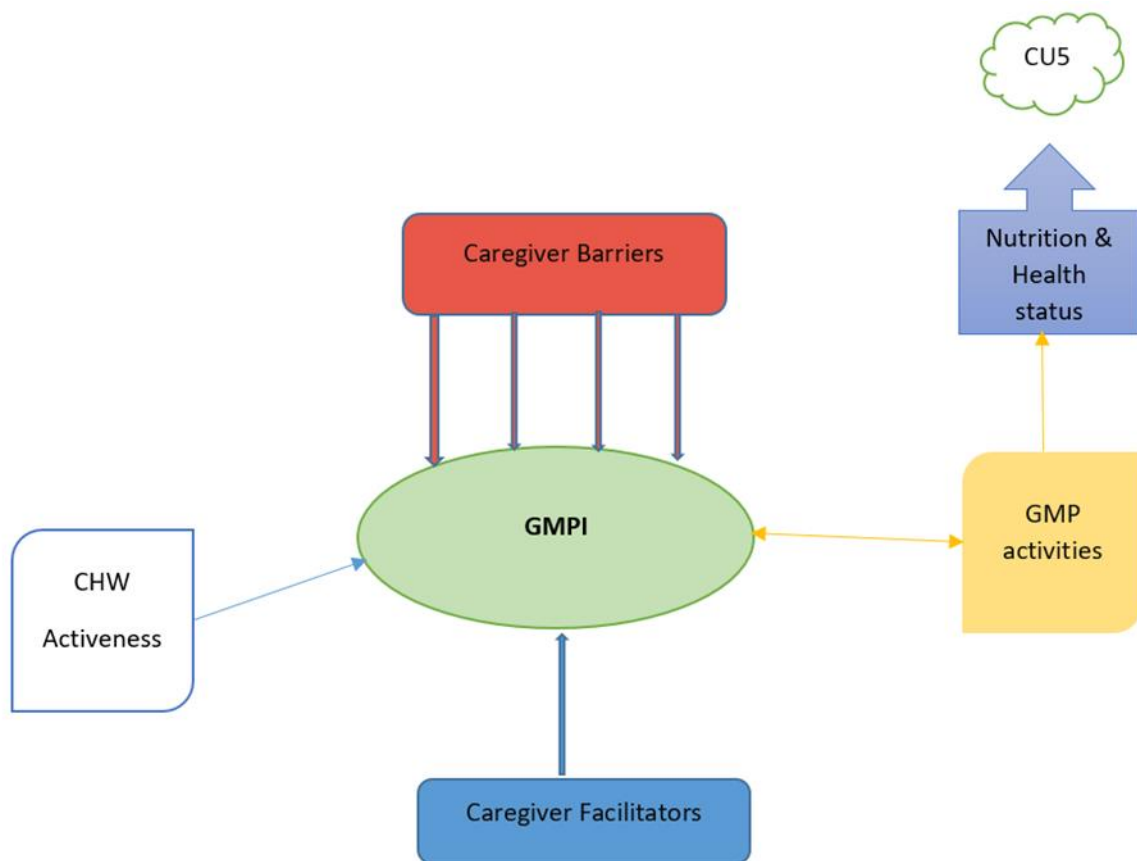


Figure 2: Conceptual framework for improved growth monitoring and promotion.

This index was developed and validated, as guided by the research protocol [10]. The study identified the different determinants that make up the GMPI. It has been shown that variables Z and Y are based on the magnitude of the barriers and facilitators found/identified, which has

a direct bearing on the GMPI. The more barriers identified, the lower the GMPI, while the more the facilitators identified, the higher the GMPI. The GMP considers each variable's magnitude, and therefore it can be applied in any given context. It draws on the characteristics of each variable, no matter the strength or magnitude or lack thereof.

The Delphi Technique outcome used to validate the index did not result in any changes to the new GMPI variables. Contextualisation and validation strengthened the initial acceptance of the GMPI and thus increased its chances of being implemented and resulting in the intended outcomes [22]. The key takeaway is that the GMPI needs to be piloted in other districts, and after that, refinements, if any, can be made.

Through their scoping literature review, the researchers showed that not many child health-related indexes exist [23]. Therefore, this new GMPI and its development have added to the body of existing knowledge. Furthermore, the study has important implications for GMP programme design as through its use, areas needing resources (human, financial, time) allocation can be supported appropriately.

5.1 The implication of the GMPI

The child health indexes that are currently existing are weight-for-height, height-for-age, weight-for-age and so forth [24]. The variables also follow the names of the indexes as well, i.e. weight-for-height, height-for-age, and weight-for-age. The coming of the GMPI brings in a new set of variables to assess the quality of GMP activities conducted by CHWs. The new variables are CHW Activeness and Barriers and facilitators towards GMP for caregivers. These three variables are very important to the successful implementation of GMP, yet they were never combined into a single index. Thus the GMPI has combined the activeness of CHWs, who are the interlink between the communities and the health facilities within the community health system, and barriers and facilitators affecting caregivers from attending GMP. The GMP is at the centre of GMP activities as it can sound alarm bells on the implementation of GMP activities that will be performing poorly. This helps the GMP implementers better understand the actual problem when, for example, the number of children attending GMP is low. The GMPI will also be able to guide us as to where the challenge is. Is it the CHWs? Is it the caregivers? What is currently existing are indicators that show the number of children whose weight or MUAC has been measured. What this data does not tell us is anything related to whether few children were measured due to inactivity of CHWs or caregivers did not bring the CU5 for GMP. Using the GMPI, it would be clear which GMP aspect is lagging behind and aide GMP implementers develop specific strategies based on the low performing variable, thus helping to make GMP data more meaningful for all.

In order to have improved GMP, caregiver barriers need to be reduced, caregiver facilitators increased and CHWs remain active for the GMPI to remain high. Improved GMP will then result in improved nutrition and health status of CU5.

6.0 Recommendations

The study recommendations are outlined below per each GMP constituent and are thus for GMP program implementers (MOHCC, NGOs, CBOs, research and funding institutions):

Community Health Workers

- ✚ CHWs are volunteers and are not meant to be working full time, i.e. 40 hours a week. Furthermore, this is their understanding when they are enrolled as CHWs. It is thus unclear what the correct position should be as on paper it is said they should work for 2-3 half days a week, while in reality, they are working longer than this. The correct position needs to be established and enforced for the risk of volunteer burnout and demise of the active CHW cadre.

Caregivers of children under five years

- ✚ Strategies need to be put in place to reduce the number of barriers hindering caregivers from attending GMP. The objective of GMP for the CU5 is a preventive measure along with providing a curative platform to prevent child morbidity and mortality. When caregivers do not attend GMP, the children suffer ultimately. It is thus imperative for even policies to be put in place that not only ensure attendance but also address the barriers such as those that were identified by this study

New GMPI

- ✚ Based on the outcome of the validation exercise with the technical experts, the GMPI must be piloted in a selected district. That is the only way that GMP implementers can make any practical improvements to improve the index, if any.

Limitations

The variable of CHW activeness is prone to recall bias as it was based on a recollection of the number of hours per week spent on CHW activities. Only one level of validation could be held for the GMPI with technical experts and nothing for the lower-level end users at the district level due to limitations in funding for the study.

Conclusion

The development of this GMPI opens doors for further refinement. A new dawn has arrived where public health practitioners are being challenged to continue identifying practical ways in which all the data obtained daily from varying health programs become more meaningful to the end users such as MOHCC. The GMPI will be used to classify the GMP performance of districts through the DHIS2, thus strengthening the quality of GMP activities.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data will be made available upon reasonable request.

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Section C: **Summary, Recommendations, Study Limitations, Implications of the study and Conclusions**

This section outlines the summary of the article format study that developed a GMP index to improve the quality of growth monitoring and promotion activities in the Umguza district. The study consisted of three phases aimed at achieving the objectives of this study: phase one was the scoping literature review, phase two was the needs analysis, and phase three was index development. Recommendations from this study, limitations, study implications and the conclusion will also be outlined.

Summary

This study was presented in article format and resulted in 2 published papers and 3 under review with different journals.

The purpose of the study was to develop a GMP index to improve the quality of growth monitoring and promotion activities in the Umguza district. This was to be achieved through the following study objectives:

Phase 1: Literature review

3. To explore and analyse knowledge gaps about GMP activities,
4. To describe key characteristics related to GMP index development.

Phase 2: Needs analysis

- 5) To explore the process of GMP within the Umguza health system as conducted by CHWs,
- 6) To determine how knowledge of growth monitoring and promotion by CHWs translates to a frequency of activities,
- 7) To determine the barriers and facilitators towards GMP attendance by caregivers of CU5,
- 8) To identify sustainable best practices among CHWs, consistently conducting growth monitoring and promotion activities.

Phase 3: Index development

- 3) To construct a GMP Index and guidelines for usage,
- 4) To test and validate the GMP index.

From the second paper, the Antecedents of GMP identified were distance and socio-cultural constraints, CHW activeness, participation of fathers in GMP activities, poor understanding and interpretation of growth charts, poor communication between caregivers and CHWs, full vaccination status and complacency; Attributes were education status of parents, knowledge,

attitude and practices of caregivers and the Consequences were timely health interventions, improved child health outcomes and a platform to promote optimal child health practices of GMP. It was also found from literature that apart from the existing child health indexes of weigh-for-height, height-for-age, weight-for-age and body mass index, no indexes existed that combined caregiver barriers and facilitators to GMP and CHW activeness. This saw the achievement of objectives 1 and 2 under Phase 1.

From the third paper it was shown that at least 68% of CHWs are conducting monthly GMP activities within Umguzu district. Almost all CHWs had equipment such as weighing scales and MUAC tapes for use during GMP activities and this was also identified as a best practice. Their knowledge levels of GMP components were very high (above 90%). It was also shown that there was a significant relationship between the level of knowledge of GMP aspects by the CHWs and the frequency of GMP activities, $\chi^2(1, N=186) = 16.412, p < .001$. The study objectives 1, 2 and 4 under Phase 2 were thus achieved.

From the fourth paper, barriers and facilitators affecting caregivers of CU5 from attending GMP activities in Umguzu district were identified by the study. The four barriers identified were the distance to health facilities, duration of GMP activities, transport costs and the lack of family support, while the only facilitator was distance to the health facilities. Objective 3 under Phase 2 was achieved through this paper.

The GMPI development was outlined in fifth paper along with its guidelines for usage. From this study, the GMP index (GMPI) was defined as the quality of GMP activities as conducted by CHWs. It is a function of CHW activeness, the magnitude of caregiver barriers to GMP and the magnitude of caregiver facilitators towards GMP. It is a composite index represented by the following equation:

$$\text{GMPI} = X+Y+Z \quad \text{where variables;}$$

X = CHW activeness

Y = Caregiver barriers to GMP

Z = Caregiver motivators towards GMP

Based on the thresholds outlined, the GMPI for Umguzu district was found to be Low (0.5). From the validation of the GMPI done with technical experts, it was recommended that it be piloted by the MOHCC in a separate district so as to see its usability and any other refinements if necessary before any scale-up can be done. Objectives 1 and 2 under Phase 3 were achieved through this paper.

Recommendations

The study recommendations are outlined below per each GMP constituent and are thus for GMP program implementers (MOHCC, NGOs, CBOs, research and funding institutions):

Community Health Workers

- ✚ CHWs are volunteers and are not meant to be working full time, i.e. 40 hours a week. Furthermore, this is their understanding when they are enrolled as CHWs. It is thus unclear what the correct position should be as on paper it is said they should work for 2-3 half days a week, while in reality, they are working longer than this. The correct position needs to be established and enforced for the risk of volunteer burnout and demise of the active CHW cadre.

Caregivers of children under five years

- ✚ Strategies need to be put in place to reduce the number of barriers hindering caregivers from attending GMP. The objective of GMP for the CU5 is a preventive measure along with providing a curative platform to prevent child morbidity and morbidity. When caregivers do not attend GMP, the children suffer ultimately. It is thus imperative for even policies to be put in place that not only ensure attendance but also address the barriers such as those that were identified by this study

Ministry of Health and Child Care (MOHCC)

- ✚ Based on the outcome of the validation exercise with the technical experts, the GMPI must be piloted in a selected district. That is the only way that GMP implementers can make any practical improvements to improve the index, if any.

Study limitations

From the scoping literature review, the findings from different literature sources were presented according to themes using Rodger's Conceptual Framework, i.e. attributes, antecedents and consequences and not independently. This then limited the extent to which opinions could be generalised along with possible biases towards themes.

The variable of CHW activeness is prone to recall bias as it was based on a recollection of the number of hours per week spent on CHW activities. Only one level of validation could be held for the GMPI with technical experts and nothing for the lower-level end users at the district level due to limitations in funding for the study.

Despite the study is open to both men and women as 'caregivers of CU5', only women participated. This would then make the study seem like it focused on women only, but this was not the case. Furthermore, probing of the barriers and facilitators in the FGDs was done with only 'non-doers'; hence perceptions captured in this study exclude those of the 'doers'.

The GMPI cannot be classified as simple or difficult to construct as it is yet to be piloted in another district. Such replication would aid in its description of whether or not it is simple to construct.

Implications of the study

The child health indexes that are currently existing are the weight-for-height, height-for-age, weight-for-age and so forth. The variables also follow the names of the indexes as well i.e weight, height/length, age. The developed GMPI brings in a new set of variables to assess the quality of GMP activities as conducted by CHWs. The new variables being CHW Activeness and Barriers and facilitators towards GMP for caregivers. These three variables are very important to the successful implementation of GMP yet they were never combined into a single index. Thus the developed GMPI has combined the activeness of CHWs who are the interlink between the communities and the health facilities within the community health system and barriers and facilitators affecting caregivers from attending GMP. The GMPI is at the centre of GMP activities as it can sound alarm bells on the implementation of GMP activities that will be performing poorly. This helps GMP implementers to understand better where the actual problem is when for example the number of children attending GMP is low. The GMPI will also be able to guide as to where the challenge is. Is it the CHWs? Is it the caregivers? What is currently existing are indicators that show the number of children whose weight or MUAC has been measured. What this data does not tell us is anything related to whether few children were measured due to inactivity of CHWs or caregivers did not bring the CU5 for GMP. Using the GMPI, it would be clear which GMP aspect is lagging behind and aide GMP implementers develop specific strategies based on the low performing variable, thus helping to make GMP data more meaningful for all.

In order to have improved GMP, caregiver barriers need to be reduced, caregiver facilitators increased and CHWs remain active for the GMPI to remain high. Improved GMP will then result in improved nutrition and health status of CU5.

Conclusions

In concluding this study, each paper will be concluded along with the study's overall conclusion.

Paper Two: Growth Monitoring and Promotion and Index development for improved child health: A Scoping Review using Rodgers Concept Analysis Framework

GMP is complex, and as such, indicators of measurement are rendered complex due to the multi-dimensional nature of factors affecting GMP. Programmes implementing GMP activities need to invest in further research to provide an increased evidence base to guide the health system, funders and policymakers conclusively.

Paper Three: Knowledge and performance of growth monitoring and promotion activities by Community Health Workers in Umguza District, Zimbabwe

The study provided insights into GMP activities in Zimbabwe as conducted by CHWs, the knowledge levels on selected GMP aspects and some best practices. The study adds to the body of knowledge on GMP activities conducted by CHWs in Zimbabwe and possible areas for further research.

Paper Four: Barriers and Facilitators to growth monitoring and promotion in Umguza District, Zimbabwe: Caregiver perspectives: Conclusion

Much still needs to be learnt from caregivers of CU5 with regards to their behaviours as it relates to their children's health. Certainly, no one-size-fits-all approach can be made through SBC approaches. Still, a multi-pronged approach should delve deeper into realistically addressing the barriers identified herein whilst also leveraging on the enablers as well. The results from this study will be used towards developing a GMP index through the use of those barriers identified as significant and those significant facilitators towards GMP attendance that have been identified.

Paper Five: Growth Monitoring and Promotion Index development: A novel approach towards GMP classification: Conclusion

The development of this GMPI opens doors for further refinement. A new dawn has arrived where public health practitioners are being challenged to continue identifying practical ways in which all the data obtained daily from varying health programs become more meaningful to the end users such as MOHCC. The GMPI will be used to classify the GMP performance of districts through the DHIS2, thus strengthening the quality of GMP activities.

General Conclusion

In the development of the GMPI, literature was reviewed that highlighted gaps with regard to the types and number of child health indexes currently existing. Thus, research must continue for more child-health indexes to be developed. As GMP in Zimbabwe is an integral part of the nutrition surveillance system, which operates from the national level to the community level, it is important to maintain quality activity implementation to maximise resource use and allocation. While a great initiative has been taken with regard to the development of the new and much-needed GMPI, the onus is now on the MOHCC and other GMP implementers at the district level to test it and adapt it for improved GMP.

Appendices

Appendix 1: Ethics Clearance Certificate (University of Venda)

ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms A Moyo

STUDENT NO:
20025413

PROJECT TITLE: A Growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe.

PROJECT NO: FHS/21/PH/23/0511

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr NS Mashau	University of Venda	Supervisor
Prof L Makhado	University of Venda	Co - Supervisor
Ms A Moyo	University of Venda	Investigator - Student

Type: Doctoral Research

Risk: Minimal risk to humans, animals or environment (Category 2)

Approval Period: November 2021 – November 2024

The Human and Clinical Trials Research Ethics Committee (HCTREC) hereby approves your project as indicated above.

General Conditions

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following.

- The project leader (principal investigator) must report in the prescribed format to the REC:
 - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project
 - Within three months of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
 - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the REC. Would there be deviations from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date; a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
 - Request access to any information or data at any time during the course or after completion of the project.
 - To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
 - withdraw or postpone approval if:
 - Any unethical principles or practices of the project are revealed or suspected.
 - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented.
 - The required annual report and reporting of adverse events was not done timely and accurately.
 - New institutional rules, national legislation or international conventions deem it necessary

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: October 2021

Name of the HCTREC Chairperson of the Committee: Prof Pascal O Bessong

Signature: 

<p>UNIVERSITY OF VENDA OFFICE OF THE DIRECTOR RESEARCH AND INNOVATION</p> <p>2021 -11- 15</p> <p>Private Bag X5050 Thohoyandou 0950</p>

Appendix 2: Ethics Clearance Certificate (Medical Research Council of Zimbabwe)

Telephone: 242791193/08644073772
E-mail: mrcz@mrcz.org.zw
Website: <http://www.mrcz.org.zw>



Medical Research Council of Zimbabwe
20 Cambridge Road
Avondale
Harare
Zimbabwe

APPROVAL

MRCZ/A/2877

06 July 2022

Shamiso Alice Moyo
43 Aberdeen Road
Matsheumhlope,
Bulawayo

RE: A Growth Monitoring and Promotion Index to improve Child health in Umguzo District in Zimbabwe Version 3.0 dated 28 June 2022

Thank you for the application for review of Research Activity that you submitted to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the Medical Research Council of Zimbabwe has reviewed and approved your application to conduct the above titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review:-

- Protocol Version 3.0 dated 28 June 2022
- Caregiver Informed Consent Forms (English and Ndebele) Version 3.0 dated 28 June 2022
- CHW Informed Consent Forms (English and Ndebele) Version 3.0 dated 28 June 2022
- Data Collection Tools

• APPROVAL NUMBER : MRCZ/A/2877

This number should be used on all correspondence, consent forms and documents as appropriate.

- TYPE OF MEETING : Full Board
- MEETING DATE : 30 June 2022
- EFFECTIVE APPROVAL DATE : 06 July 2022
- EXPIRATION DATE : 05 July 2023


After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted three months before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.
- **MODIFICATIONS:** Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.
- **QUESTIONS:** Please contact the MRCZ on Telephone No. (0242)791193, 08644073772 or by e-mail on mrcz@mrcz.org.zw

Other

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.
- In addition to this approval, all clinical trials involving drugs, devices and biologics (including other studies focusing on registered drugs) require approval of Medicines Control Authority of Zimbabwe (MCAZ) before commencement

Yours Faithfully


MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE



PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH

Appendix 3: Permission from the Ministry of Health and Child Care of Zimbabwe

Byo 28/08/22 H.M. for M.T. for



Telephone Nos.: +263 9 77919 /
77323

Fax Nos. +263 9 68976 / 79891

Reference:

MINISTRY OF HEALTH AND CHILD CARE

PROVINCIAL MEDICAL DIRECTOR

(MATEBELELAND NORTH)

10 August 2022

The District Medical Officer

Umguza District

RE: Permission to conduct PhD in Public Health data collection by Shamiso Alice Moyo

Permission has been granted to Shamiso Alice Moyo, a PhD student currently in the process of studying towards a PhD in Public Health with the University of Venda, Limpopo, South Africa. As part of the PhD, she will be conducting research in Umguza District. Her study aims to develop a Growth Monitoring and Promotion Index to improve child health in Umguza district, Zimbabwe.

Please find the protocol attached with this request that describes the background and motivation for the study and what is proposed in terms of the data collection process.

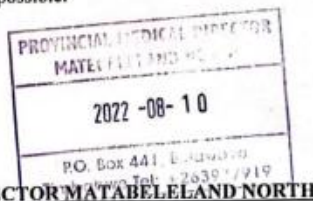
Ethical approval for this research has been approved by the University of Vendas Research Ethics Committee. (REFERENCE NUMBER: FHS/21/PH/23/0511) and Medical Research Council of Zimbabwe number MRCZ/A/2877.

Please assist her in whichever way possible.

Thank you

A.K.
DR A KURETU

PROVINCIAL MEDICAL DIRECTOR MATEBELELAND NORTH



Appendix 4: Informed Consent form- Caregivers FGD: English Version

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

LETTER OF INFORMATION

Title of the Research Study : A Growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe”

Principal Investigator/s/ researcher : (*Shamiso Alice Dzumbunu, MPH*)

Co-Investigator/s/supervisor/s : (*Dr N Mashau, PhD; Prof L Makhado, PhD*)

What you should know about this research study:

- We give you this consent form so that you may read about this research study's purpose, risks and benefits.
- The main goal of research studies is to gain knowledge that may help communities.
- We cannot promise that this research will benefit you directly.
- You have the right to refuse or agree to take part now and change your mind later.
- Whatever you decide, it will not affect your regular care.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

Brief Introduction and Purpose of the Study:

In Zimbabwe, growth monitoring and promotion, as conducted by community health workers, are part of the nutritional surveillance system. With numerous challenges this programme faces, this study seeks to dive deeper into growth monitoring and promotion activities at the community level while also considering the role played by caregivers of children under five years. This study seeks to develop a growth monitoring and promotion index that will be used to improve the classification of child health in the district. You are

being asked to participate in this study, “A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe,” as you can provide insights that could be used in the development of the GMP index as a key stakeholder in the growth monitoring and promotion of children under five years. Permission to conduct the study will be sought from the Medical Research Council of Zimbabwe, the HCTREC of the University of Venda and the Provincial Medical Directorate for Matabeleland North Province.

Outline of the Procedures

You have been selected to participate in this study. You will be required to participate in a Focus Group Discussion. The Focus Group Discussion is expected to take approximately 30 minutes to an hour and a half of your time. The interviews will be audio recorded and then transcribed after that. Appointments with each study participant will have been set before interviews through the local health facility.

Risks or Discomforts to the Participant:

There are no foreseeable risks of injury or inconveniences arising from participating in this study, as no form of treatment is involved. All that will be required of you is to answer questions that will be asked. Should such a situation arise, you will be excused from the discussion and referred to the health facility for professional counselling and care.

Benefits

There are no direct benefits that will be realised through participation in this study; however, if the GMP index is developed, it may improve child health and nutrition. You will not be paid to be part of this study during the data collection process.

Reason/s why the Participant May Be Withdrawn from the Study

Participation in this study is voluntary. If you decide not to participate, your decision will not affect your future relations with the researcher and any other stakeholders involved in the growth monitoring and promotion of children under five years. If you decide to participate, you can withdraw your consent and discontinue participation at any time. You will also be withdrawn from the study if you do not comply with the stipulated rules or are reacting in a way that could cause harm or discomfort to other participants and

the research. It should be noted that if you choose to withdraw or you are withdrawn from the study, there will be no adverse consequences (you will not be penalised or victimised).

Remuneration

You will not be paid to be part of this study during the data collection process.

Costs of the Study

Participants would not incur any costs by participating in this study.

Confidentiality

Participants will not be identified; they will be assigned pseudonyms that are not traceable to the participants. The information given will be kept confidential and will only be available to the researcher and the supervisors. The data collected would only be meant for academic purposes. However, if you indicate your willingness to participate in this study by signing this document, we plan to disclose the study results to the Ministry of Health and Child Care. No information obtained in this study can be identified with you.

Research-related Injury

No foreseen injuries may occur due to your participation in this study as it only involves you answering the posed questions.

OFFER TO ANSWER QUESTIONS

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Shamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges

Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or

08644073772

General:

Potential participants must be assured that participation is voluntary, and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: FHS/21/PH/23/0511,
- I have also received, read and understood the above-written information (*Participant Letter of Information*) regarding the study.
- I am aware that the study's results, including personal details regarding my sex, age, date of birth, initials, and diagnosis, will be anonymously processed into a study report.
- Given the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- At any stage, I may withdraw my consent and participation in the study without prejudice.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during this research which may relate to my participation, will be made available to me.

Full Name of Participant

Date

Time

Signature

I,.....

(*Name of researcher*) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

..... Date..... Signature.....

Full Name of Witness (If applicable)

..... Date Signature.....

Full Name of Legal Guardian (If applicable)

..... Date..... Signature.....

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner, and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting a non-threatening environment for interaction and the availability of peer counselling (Department of Health, 2004)

Suppose the potential participant is unable to read/illiterate. In that case, a right thumbprint is required, and an impartial witness who is literate and knows the participant, e.g. parent, sibling, friend, pastor, etc., should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes*

<http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/>

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at:

http://www.nhrec.org.za/?page_id=14

Appendix 5: Informed Consent form- Caregivers Survey: English Version

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

LETTER OF INFORMATION

Title of the Research Study : A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe”

Principal Investigator/s/ researcher : (*Shamiso Alice Dzumbunu, MPH*)

Co-Investigator/s/supervisor/s : (*Dr N Mashau, PhD; Prof L Makhado, PhD*)

What you should know about this research study:

- We give you this consent form so that you may read about this research study's purpose, risks and benefits.
- The main goal of research studies is to gain knowledge that may help communities.
- We cannot promise that this research will benefit you directly.
- You have the right to refuse or agree to take part now and change your mind later.
- Whatever you decide, it will not affect your regular care.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

Brief Introduction and Purpose of the Study:

In Zimbabwe, growth monitoring and promotion, as conducted by community health workers, is part of the nutritional surveillance system. With numerous challenges this programme faces, this study seeks to dive deeper into growth monitoring and promotion activities at the community level while also considering the role played by caregivers of children under five years. This study seeks to develop a growth monitoring and

promotion index that will be used to improve the classification of child health in the district. You are being asked to participate in this study, “A growth Monitoring and Promotion Index to improve Child health in Umuza District in Zimbabwe,” as you can provide insights that could be used in the development of the GMP index as a key stakeholder in the growth monitoring and promotion of children under five years. Permission to conduct the study will be sought from the Medical Research Council of Zimbabwe, the HCTREC of the University of Venda and the Provincial Medical Directorate for Matabeleland North Province.

Outline of the Procedures

You have been selected to participate in this study. You will be required to respond to an interviewer-administered questionnaire. The interview and questionnaire administration is expected to take approximately 40 minutes of your time. Appointments with each study participant will have been set before interviews through the local health facility.

Risks or Discomforts to the Participant:

There are no foreseeable risks of injury or inconveniences arising from participating in this study, as no form of treatment is involved. All that will be required of you is to answer questions that will be asked. Should such a situation arise, you will be excused from the discussion and referred to the health facility for professional counselling and care.

Benefits

There are no direct benefits that will be realised through participation in this study; however, if the GMP index is developed, it may improve child health and nutrition. You will not be paid to be part of this study during the data collection process.

Reason/s why the Participant May Be Withdrawn from the Study

Participation in this study is voluntary. If you decide not to participate, your decision will not affect your future relations with the researcher and any other stakeholders involved in the growth monitoring and promotion of children under five years. If you decide to participate, you can withdraw your consent and discontinue participation at any time. You will also be withdrawn from the study if you do not comply with the stipulated rules or are reacting in a way that could cause harm or discomfort to other participants and the research. It should be noted that if you choose to withdraw or you are withdrawn from the study, there will be no adverse consequences (you will not be penalised or victimised).

Remuneration

You will not be paid to be part of this study during the data collection process.

Costs of the Study

Participants would not incur any costs by participating in this study.

Confidentiality

Participants will not be identified; they will be assigned pseudonyms that are not traceable to the participants. The information given will be kept confidential and will only be available to the researcher and the supervisors. The data collected would only be meant for academic purposes. However, if you indicate your willingness to participate in this study by signing this document, we plan to disclose the study results to the Ministry of Health and Child Care. No information obtained in this study can be identified with you.

Research-related Injury

No foreseen injuries may occur due to your participation in this study as it only involves you answering the posed questions.

OFFER TO ANSWER QUESTIONS

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Shamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau or the University Research Ethics Committee Secretariat at 015 962 9058. Complaints can be reported to the Director of Research and Innovation, Prof GE Ekosse, on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or

08644073772

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to

participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: FHS/21/PH/23/0511,
- I have also received, read and understood the above-written information (*Participant Letter of Information*) regarding the study.
- I am aware that the study's results, including personal details regarding my sex, age, date of birth, initials, and diagnosis, will be anonymously processed into a study report.
- Given the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- At any stage, I may withdraw my consent and participation in the study without prejudice.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during this research which may relate to my participation, will be made available to me.

Full Name of Participant

Date

Time

Signature

I,.....

(Name of researcher) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

..... Date..... Signature.....

Full Name of Witness (If applicable)

..... Date Signature.....

Full Name of Legal Guardian (If applicable)

..... Date..... Signature.....

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner, and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting a non-threatening environment for interaction and the availability of peer counselling (Department of Health, 2004)

Suppose the potential participant is unable to read/illiterate. In that case, a right thumbprint is required, and an impartial witness who is literate and knows the participant, e.g. parent, sibling, friend, pastor, etc., should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document, e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes*

<http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/>

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at:

http://www.nhrec.org.za/?page_id=14

Appendix 6: Informed Consent form- CHW Survey: English Version

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

LETTER OF INFORMATION

Title of the Research Study : A Growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe”

Principal Investigator/s/ researcher : (*Shamiso Alice Dzumbunu, MPH*)

Co-Investigator/s/supervisor/s : (*Dr N Mashau, PhD; Prof L Makhado, PhD*)

What you should know about this research study:

- We give you this consent form so that you may read about the purpose, risks and benefits of this research study.
- The main goal of research studies is to gain knowledge that may help communities.
- We cannot promise that this research will benefit you directly.
- You have the right to refuse to take part or agree to take part now and change your mind later.
- Whatever you decide, it will not affect your regular care.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

Brief Introduction and Purpose of the Study:

In Zimbabwe, growth monitoring and promotion as conducted by community health workers is part of the nutritional surveillance system. With numerous challenges being faced by this programme, this study seeks to dive deeper into growth monitoring and promotion activities at the community level while also taking into account the role played by caregivers of children under five years. This study seeks to develop a growth monitoring and promotion index that will be used to improve the classification of child health in the district. You are being asked to participate in this study “A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe” as you are able to provide insights that could be used in the development of the GMP index as a key stakeholder in the growth monitoring and promotion of children under five years. Permission to conduct the study will be sought from the Medical Research Council of Zimbabwe, the HCTREC of the University of Venda and the Provincial Medical Directorate for Matabeleland North Province.

Outline of the Procedures

You have been selected to participate in this study. You will be required to respond to an interviewer administered questionnaire (survey). The interview and questionnaire administration is expected to take

approximately 40 minutes of your time. Appointments with each study participant will have been set prior to interviews through the local health facility.

Risks or Discomforts to the Participant:

There are no foreseeable risks of injury or inconveniences which may arise from participating in this study as no form of treatment is involved. All that will be required of you is to answer questions that will be asked. Should such a situation arise, you will be excused from the discussion and referred to the health facility for professional counselling and care.

Benefits

There are no direct benefits that are going to be realised through participation in this study, however, if the GMP index is developed it may improve child health and nutrition. You will not be paid to be part of this study during the data collection process.

Reason/s why the Participant May Be Withdrawn from the Study

Participation in this study is voluntary. If you decide not to participate, your decision will not affect your future relations with the researcher and any other stakeholders that are involved in the growth monitoring and promotion of children under five years. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time. You will also be withdrawn from the study if you do not comply with the stipulated rules or if you are reacting in a way that could cause harm or discomfort to other participants and the research. It should be noted that if you choose to withdraw or you are withdrawn from the study there will be no adverse consequences (you will not be penalised or victimised).

Remuneration

You will not be paid to be part of this study during the data collection process.

Costs of the Study

Participants would not incur any costs by participating in this study.

Confidentiality

Participants would not be identified, they will be assigned pseudonyms that are not traceable to the actual participants. The information given will be kept confidential and would only be available to the researcher and the supervisors. The data collected would only be meant for academic purposes. However, if you indicate your willingness to participate in this study by signing this document, we plan to disclose the results of the study to the Ministry of Health and Child Care. No information obtained in this study can be identified with you.

Research-related Injury

There are no foreseen injuries that may occur due to your participation in this study as it only involves you answering the posed questions.

OFFER TO ANSWER QUESTIONS

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Shamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or

08644073772

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: FHS/21/PH/23/0511,
- I have also received, read and understood the above written information (*Participant Letter of Information*) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant

Date

Time

Signature

I,.....



(Name of researcher) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

..... Date..... Signature.....

Full Name of Witness (If applicable)

..... Date Signature.....

Full Name of Legal Guardian (If applicable)

..... Date..... Signature.....

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes*

<http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/>

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at:

http://www.nhrec.org.za/?page_id=14

Appendix 7: Informed Consent form- Caregivers FGD: isiNdebele Version

Ugwalo oluqukethe umbiko lesivumelwano - Caregivers FGD

I-RESEARCH ETHICS COMMITTEE (Ikhomithi ebona ngezophenyo)

UNIVEN Informed Consent

Ugwalo oluqukethe umbiko

Isihloko sophenyo: A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe” (Indlela engasetshenziswa ukuqaphela lokukhuthaza ukukhula kukhangelwe ukungconoza impilakahle yabantwana esiqintini seMguza eZimbabwe

Umphenyi omkhulu: (*Shamiso Alice Dzumbunu, MPH*)

Abanye abaphenyi/ Abaphathi : (*Dr NS Mashau, PhD; Prof L Makhado, PhD*)

Okumele ukwazi ngaloluphenyo: Ifomu elidinga imvumo yakho sikuphela ukuthi ubale wazi ngenjongo yaloluphenyo, ingozi ezingabakhona kanye lokuhle okuzatholakala ngalo.

- Injongo emqoka ngalezizifundo zophenyo yikwandisa ulwazi olungasiza izigaba zethu.
- Asethembisi ukuthi uphenyo lolu lwenzelwa ukuncedisa wena qho. .
- Kulilungelo lakho ukuthi untshintshe umqondo ngokuba yingxenywe yaloluphenyo.
- Loba yikuphi oyabe ukukhethile, kakusoze kuphambanise usizo olutholayo ngensuku ngensuku
- Hlolisisa ifomu efuna imvumo yakho ngonanzelelo. Buza imibuzo ungakenzi isinqumo. .
- Ukuphatheka kwakho kuloluphenyo ngokokuzithandela kawuphoqwa..

Isingeniso mayelana lenhloso yophenyo. :

KweleZimbabwe, ukuhlola indlela umuntu akhula ngayo Kanye lokukhuthaza okuqhutshwa yizisebenzi zempilakahle ezigabeni kuyingxenywe yomzamo wokuhlolisisa ngezokudla okwakha umzimba. Ngenxa yengxaki ezinengi ezitholakala kuloluhlelo, loluphenyo lufuna ukujula kabanzi lubheke eminye imisebenzi eyenziwayo ukuqhuba inhlelo zokuqaphela ngokukhula(growth monitoring) ezigabeni. Lokhu kwenziwa kukhangelwe umlandu walabo abanakekela abantwana abangaphansi kweminyaka emihlanu. Loluphenyo luhlose ukuphuma lendlela ezasetshenziswa (index) ukungconoza ukuhlelwa kwezempilakahle zabantwana ezabelweni. Ucelwa ukuthi uphatheke kuloluphenyo “A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe” ngoba ulakho ukusinika imibono engasetshenziswa ukuze kubunjwe lindlela (iGMP index). Imvumo yokwenza loluphenyo sizayicela kugatsha lweMedical Research Council of Zimbabwe, lase HCTREC ese University of Venda leProvincial Medical Directorate for Matabeleland North Province.

Indlela okuzaqhutshwa ngayo

Ukhethiwe ukuthi uphatheke kuloluphenyo. Ungacelwa ukuthi kubelomuntu okubuza imibuzo wena uphendula, ukuphendula imibuzo elotshwe phansi kumbe njalo uphatheke lapho okubuzwa khona imibuzo abantu beliqenjana (Focus Group Discussions). Imibuzo ebuza iqenjana labantu izathatha imizuzu eyingxenywe yehola kusiya kuhola lengxenywe yesikhathi sakho. Kusetshenziswa abezempilakahle esigabeni, kuzahlelwa isikhathi sokuhlengisa lomunye walowo lalowo ozaphatheka kuloluphenyo kungakenziwa ingxoxo ezihleliweyo.

Okungaphatha kubi lowo ohlanganyele kuloluphenyo:

Kakukhangelelwanga ukuthi kungaba lengozi yokulimala kumbe okunye njalo okuphambanisayo okungabangelwa yikuphatheka kulesisifundo njengoba kungelakwelatsha muntu. Okudingekayo nje yikuphendula leyo mibuzo eyabe ibuziwe. Nxa umumo onje ungenzeka, uzacelwa ukuthi uyekele ukuphatheka ubususiwa esibhedlela sabezemilakahle ukuze uthole usizo oluvela kwabalolwazi lokweluleka lokunakekela.

Inzuzo

Kakulanzuzo ezabuya iqondene lalowo ophatheke kusifundo kodwa iGMP index ingabakhona izangconozisa ezempilakahle zabantwana lokudla obakudlayo. Kawusoze ubhadalwe ukuba yingxenywe yalesisifundo ngesikhathi kulondwa ulwazi (data)

Izizatho ezingenza ophathekayo acine emisiwe ukuba yingxenywe yalesisifundo

Ukuphatheka kuloluhlelo kuya ngokuzithandela. Ukukhetha ukungaphatheki kakusoze kuphambanise ubudlelwano bakho lophenyayo kumbe njalo yiloba ngubani oyingxenywe yekuhloleni ngezokukhula kwabantwana abangaphansi kweminyaka emihlanu. Ukhululekile njalo ukwesula isivumelwano osisayine ngaphambilini yiloba yisiphi isikhathi unxa ungasaphatheki kuphenyo. Uzakhitshwa ekubeni yingxenywe yophenyayo nxa ungalandeli izimiso ezifakiweyo kumbe nxa ukuziphatha kwakho kuphambanisa uphenyo kumbe abanye abaphatheke kuloluphenyo. Nxa suthe waphuma kumbe wakhitshwa kulesisifundo kakulasigwebo ozabhekana laso.

Ezembadalo

Kakulambadalo ukuba yingxenywe yaloluphenyo lapho kudingwa ulwazi(data)

Indleko zophenyayo

Kakulandleko ezizadingeka ngokuphatheka kuloluphenyo

Imfihlo

Ophathekayo kasoze aziwe ukuthi ngubani, bazanikezwa inombolo ezingasoze zilandelelwe ukuthi beziphiwe bani. Ulwazi olutholakeleyo luzagcinwa luyimfihlo lusaziwa kuphela ngophenyayo labathungameli bakhe. Lokhu okutholakeleyo kuzasetshenziswa kuphela kwezemfundo. Kodwa ke nxa uvume ukuphatheka kulesisifundo ngokusayina lumbhalo, sihlele ukwazisa ugatsha lwabezempilakahle lokunakekelwa kwabantwana (Ministry of Health and Child Care). Kakula lwazi oluzabe lutholakale kuloluphenyo oluzakhomba ukuthi luvele kuwe.

Ukulimala okungavela ngenxa yophenyayo

Kakulakulimanga okukhangelelwe ukuthi kungenzeka kuloluphenyo njengoba lugoqela ukuphendula imibuzo ebuziweyo kuphela. **Buza imibuzo**

Ungakasayini lifomu buza okunye ongabe ungakuzwisi, Ungathatha isikhathi eside ukucabangisisa lokhu.

Ongabathinta nxa usuhlangene lenkinga thize kumbe ulemibuzo:

Thintana lomphenyi uShamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau kumbe iUniversity Research Ethics Committee Secretariat kunombolo ezithi+2715 962 9058. Insolo zingahanjiswa kokhokheleyo (Director): Research and Innovation, Prof GE Ekosse kulezi inombolo +2715 962 8313 kumbe Georges Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or 08644073772

Okunye nje:

Labo abakhanya engathi bengaphatheka ehlelweni kumele baziswe ukuthi lokhu kwenziwa ngokuzithandela njalo kumele kwaziswe inani labantu abadingakalayo kuloluphenyo. Ikhophi yencwadi elombiko ngophenyo kumele iphiwe abaphatheke ehlelweni. Ugwalo oluqukethe umbiko kanye lencwadi edinga imvumo kumele kunikwe labo abaphathekayo njalo lokhu kumele kulumutshelwe elimini lwalabo abazaphatheka.

Imvumo

Isivumelwano esiphawula ukuvuma ukuphatheka ehlelweni lokuphenya

- Nginyaqinisa ukuthi ngazisiwe ngophenyayo (*Ibizo lalowo ophenyayo*) ngesimo, ukuziphatha, inzuzo kanye lengozi eziphathelele lesisifundo- Research Ethics Clearance Number: FHS/21/PH/23/0511,
- Ngitholile, ngabala njalo ngazwisisa okulotshwe ngaphambili (*Participant Letter of Information*) okuphathelele lesisifundo esenziwayo.
- Ngiyazi ukuthi impumela yalesisifundo kugoqela okuphathelele lobulili bami, iminyaka, ilanga lokuzalwa, isiqalo sebizo lempumela kuzalungiswa kuhlelwe kungaqondaniswanga lami kuloluphenyo.
- Nxa kulandelwa indingeko zaloluphenyo ngiyavuma ukuthi ulwazi(idatha) olutholakeleyo phakathi kwalesisifundo luhlelwe kusetshenziswa ikhompuyutha ngumpheni. .
- Kungenzeka ukuthi ngiphume ekuphathekeni kulesisifundo kungelansolo thize laloba uphenyo lukusiphi isibanga.
- Ngitholile ithuba eleneleyo ukuthi ngibuze imibuzo (ngokuthanda kwami) kungakho ngilungele ukuphatheka kulesisifundoNgiyazwisisa ukuthi okutsha okungabe kutholakele kusenziwa loluphenyo okuqondana lokuphatheka kwami ngizakwaziswa.

Ibizo lophathekayo ngokugcweleyo:

Ilanga

Isikhathi:

Sayina lapha

Mina,.....

(Ibizo lomphenyi) ngiyaqinisa ukuthi umuntu lo ophathekileyo kuphenyo wazisiwe ngokugcweleyo'
Wazisiwe ngohlobo lophenyo kugoqela, indlela yokuziphatha lengozi ezingabakhona.

Ibizo lomphenyi ngokugcweleyo
Sayina lapha

Ilanga

Ibizo lofakazi ngokugcweleyo (Nxa kudingeka).....
Sayina lapha.....

Ilanga

Appendix 8: Informed Consent form- Caregivers Survey: isiNdebele Version

Ugwalo oluqukethe umbiko lesivumelwano - Caregivers Survey

I-RESEARCH ETHICS COMMITTEE (Ikhomithi ebona ngezophenyo)

UNIVEN Informed Consent

Ugwalo oluqukethe umbiko

Isihloko sophenyo: A growth Monitoring and Promotion Index to improve Child health in Umuza District in Zimbabwe” (Indlela engasetshenziswa ukuqaphela lokukhuthaza ukukhula kukhangelwe ukungconozisa impilakahle yabantwana esiqintini seMguza eZimbabwe

Umphenyi omkhulu: (*Shamiso Alice Dzumbunu, MPH*)

Abanye abaphenyi/ Abaphathi : (*Dr NS Mashau, PhD; Prof L Makhado, PhD*)

Okumele ukwazi ngaloluphenyo: Ifomu elidinga imvumo yakho sikuphela ukuthi ubale wazi ngenjongo yaloluphenyo, ingozi ezingabakhona kanye lokuhle okuzatholakala ngalo.

- Injongo emqoka ngalezizifundo zophenyo yikwandisa ulwazi olungasiza izigaba zethu.
- Asethembisi ukuthi uphenyo lolu lwenzelwa ukuncedisa wena qho. .
- Kulilungelo lakho ukuthi untshintshe umqondo ngokuba yingxenye yaloluphenyo.
- Loba yikuphi oyabe ukukhethile, kakusoze kuphambanise usizo olutholayo ngensuku ngensuku
- Hlolisisa ifomu efuna imvumo yakho ngonanzelelo. Buza imibuzo ungakenzi isinqumo. .
- Ukuphatheka kwakho kuloluphenyo ngokokuzithandela kawuphoqwa..

Isingeniso mayelana lenhloso yophenyo. :

KweleZimbabwe, ukuhlola indlela umuntu akhula ngayo Kanye lokukhuthaza okuqhutshwa yizisebenzi zempilakahle ezigabeni kuyingxenye yomzamo wokuhlolisisa ngezokudla okwakha umzimba. Ngenxa yengxaki ezinengi ezitholakala kuloluhlelo, loluphenyo lufuna ukujula kabanzi lubheke eminye imisebenzi eyenziwayo ukuqhuba inhlelo zokuqaphela ngokukhula(growth monitoring) ezigabeni. Lokhu kwenziwa kukhangelwe umlandu walabo abanakekela abantwana abangaphansi kweminyaka emihlanu. Loluphenyo luhlose ukuphuma lendlela ezasetshenziswa (index) ukungconozisa ukuhlelwa kwezempilakahle zabantwana ezabelweni. Ucelwa ukuthi uphatheke kuloluphenyo “A growth Monitoring and Promotion Index to improve Child health in Umuza District in Zimbabwe” ngoba ulakho ukusinika imibono engasetshenziswa ukuze kubunjwe lindlela (iGMP index). Imvumo yokwenza loluphenyo sizayicela kugatsha IweMedical Research Council of Zimbabwe, lase HCTREC ese University of Venda leProvincial Medical Directorate for Matabeleland North Province.

Indlela okuzaqhutshwa ngayo

Ukhethiwe ukuthi uphatheke kuloluphenyo. Ungacelwa ukuthi kubelomuntu okubuza imibuzo wena uphendula, ukuphendula imibuzo elotshwe phansi kumbe njalo uphatheke lapho okubuzwa khona imibuzo abantu beliqenjana (Focus Group Discussions). Imibuzo ebuzwa ngumuntu kugoqela leyo ebhalwe phansi kungathatha imizuzu eyi 40. Kusetshenziswa abezempilakahle esigabeni, kuzahlelwa isikhathi sokuhlangana lomunye walowo lalowo ozaphatheka kuloluphenyo kungakenziwa ingxoxo ezihleliweyo.

Okungaphatha kubi lowo ohlanganye kuloluphenyo:

Kakukhangelelwanga ukuthi kungaba lengozi yokulimala kumbe okunye njalo okuphambanisayo okungabangelwa yikuphatheka kulesisifundo njengoba kungelakwelatsha muntu. Okudingekayo nje yikuphendula leyo mibuzo eyabe ibuziwe. Nxa umumo onje ungenzeka, uzacelwa ukuthi uyekele ukuphatheka ubususiwa esibhedlela sazezempilakahle ukuze uthole usizo oluvela kwabalolwazi lokweluleka lokunakekela.

Inzuzo

Kakulanzuzo ezabuya iqondene lalowo ophatheke kusifundo kodwa iGMP index ingabakhona izangconozisa ezempilakahle zabantwana lokudla obakudlayo. Kawusoze ubhadalwe ukuba yingxenye yalesisifundo ngesikhathi kulondwa ulwazi (data)

Izizatho ezingenza ophathekayo acine emisiwe ukuba yingxenye yalesisifundo

Ukuphatheka kuloluhlelo kuya ngokuzithandela. Ukukhetha ukungaphatheki kakusoze kuphambanise ubudlelwano bakho lophenyayo kumbe njalo yiloba ngubani oyingxenye yekuhloleni ngezokukhula kwabantwana abangaphansi kweminyaka emihlanu. Ukholulekile njalo ukwesula isivumelwano osisayine ngaphambilini yiloba yisiphi isikhathi unxa ungasaphatheki kuphenyo. Uzakhitshwa ekubeni yingxenye yophenyayo nxa ungalandeli izimiso ezifakiweyo kumbe nxa ukuziphatha kwakho kuphambanisa uphenyo kumbe abanye abaphatheke kuloluphenyo. Nxa sutho waphuma kumbe wakhitshwa kulesisifundo kakulasigwebo ozabhekana laso.

Ezembadalo

Kakulambadalo ukuba yingxenye yaloluphenyo lapho kudingwa ulwazi(data)

Indleko zophenyayo

Kakulandleko ezizadingeka ngokuphatheka kuloluphenyo

Imfihlo

Ophathekayo kasoze aziwe ukuthi ngubani, bazanikezwa inombolo ezingasoze zilandelelwe ukuthi beziphiwe bani. Ulwazi olutholakeleyo luzagcinwa luyimfihlo lusaziwa kuphela ngophenyayo labathungameli bakhe. Lokhu okutholakeleyo kuzasetshenziswa kuphela kwezempundo. Kodwa ke nxa uvume ukuphatheka kulesisifundo ngokusayina lumbhalo, sihlele ukwazisa ugatsha lwabezempilakahle lokunakekelwa kwabantwana (Ministry of Health and Child Care). Kakula lwazi oluzabe lutholakale kuloluphenyo oluzakhomba ukuthi luvele kuwe.

Ukulimala okungavela ngenxa yophenyayo

Kakulakulimanga okukhangelelwe ukuthi kungenzeka kuloluphenyo njengoba lugoqela ukuphendula imibuzo ebuziweyo kuphela. **Buza imibuzo**

Ungakasayini lifomu buza okunye ongabe ungakuzwisi, Ungathatha isikhathi eside ukucabangisisa lokhu.

Ongabathinta nxa usuhlangene lenkinga thize kumbe ulemibuzo:

Thintana lomphenyi uShamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau kumbe iUniversity Research Ethics Committee Secretariat kunombolo ezithi+2715 962 9058. Insolo zingahanjiswa kokhokheleyo (Director): Research and Innovation, Prof GE Ekosse kulezi inombolo +2715 962 8313 kumbe Georges Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or 08644073772

Okunye nje:

Labo abakhanya engathi bengaphatheka ehlelweni kumele baziswe ukuthi lokhu kwenziwa ngokuzithandela njalo kumele kwaziswe inani labantu abadingakalayo kuloluphenyo. Ikhophi yencwadi elombiko ngophenyo kumele iphiwe abaphatheke ehlelweni. Ugwalo oluqukethe umbiko kanye lencwadi edinga imvumo kumele kunikwe labo abaphathekayo njalo lokhu kumele kulumutshelwe elimini lwalabo abazaphatheka.

Imvumo

Isivumelwano esiphawula ukuvuma ukuphatheka ehlelweni lokuphenya

- Nginyaqinisa ukuthi ngazisiwe ngophenyayo (*Ibizo lalowo ophenyayo*) ngesimo, ukuziphatha, inzuzo kanye lengozi eziphathelele lesisifundo- Research Ethics Clearance Number: FHS/21/PH/23/0511,
- Ngitholile, ngabala njalo ngazwisisa okulotshwe ngaphambili (*Participant Letter of Information*) okuphathelele lesisifundo esenziwayo.
- Ngiyazi ukuthi impumela yalesisifundo kugoqela okuphathelele lobulili bami, iminyaka, ilanga lokuzalwa, isiqalo sebizo lempumela kuzalungiswa kuhlelwe kungaqondaniswanga lami kuloluphenyo.
- Nxa kulandelwa indingeko zaloluphenyo ngiyavuma ukuthi ulwazi(idatha) olutholakeleyo phakathi kwalesisifundo luhlelwe kusetshenziswa ikhompuyutha ngumpheni. .
- Kungenzeka ukuthi ngiphume ekuphathekeni kulesisifundo kungelansolo thize laloba uphenyo lukusiphi isibanga.
- Ngitholile ithuba eleneleyo ukuthi ngibuze imibuzo (ngokuthanda kwami) kungakho ngilungele ukuphatheka kulesisifundoNgiyazwisisa ukuthi okutsha okungabe kutholakele kusenziwa loluphenyo okuqondana lokuphatheka kwami ngizakwaziswa.

Ibizo lophathekayo ngokugcweleyo:

Ilanga

Isikhathi:

Sayina lapha

Mina,.....

(Ibizo lomphenyi) ngiyaqinisa ukuthi umuntu lo ophathekileyo kuphenyo wazisiwe ngokugcweleyo'
Wazisiwe ngohlobo lophenyo kugoqela, indlela yokuziphatha lengozi ezingabakhona.

Ibizo lomphenyi ngokugcweleyo
Sayina lapha

Ilanga

Ibizo lofakazi ngokugcweleyo (Nxa kudingeka).....
Sayina lapha.....

Ilanga

Appendix 9: Informed Consent form- CHWs Survey: isiNdebele Version

I-RESEARCH ETHICS COMMITTEE (Ikhomithi ebona ngezophenyo)

UNIVEN Informed Consent

Ugwalo oluqukethe umbiko

Isihloko sophenyo: A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe” (Indlela engasetshenziswa ukuqaphela lokukhuthaza ukukhula kukhangelwe ukungconoza impilakahle yabantwana esiqintini seMguza eZimbabwe

Umphenyi omkhulu: (*Shamiso Alice Dzumbunu, MPH*)

Abanye abaphenyi/ Abaphathi : (*Dr NS Mashau, PhD; Prof L Makhado, PhD*)

Okumele ukwazi ngaloluphenyo: Ifomu elidinga imvumo yakho sikuphela ukuthi ubale wazi ngenjongo yaloluphenyo, ingozi ezingabakhona kanye lokuhle okuzatholakala ngalo.

- Injongo emqoka ngalezizifundo zophenyo yikwandisa ulwazi olungasiza izigaba zethu.
- Asethembisi ukuthi uphenyo lolu lwenzelwa ukuncedisa wena qho. .
- Kulilungelo lakho ukuthi untshintshe umqondo ngokuba yingxenywe yaloluphenyo.
- Loba yikuphi oyabe ukukhethile, kakusoze kuphambanise usizo olutholayo ngensuku ngensuku
- Hlolisisa ifomu efuna imvumo yakho ngonanzelelo. Buza imibuzo ungakenzi isinqumo. .
- Ukuphatheka kwakho kuloluphenyo ngokokuzithandela kawuphoqwa..

Isingeniso mayelana lenhloso yophenyo. :

KweleZimbabwe, ukuhlola indlela umuntu akhula ngayo Kanye lokukukhuthaza okuqhutshwa yizisebenzi zempilakahle ezigabeni kuyingxenywe yomzamo wokuhlolisisa ngezokudla okwakha umzimba. Ngenxa yengxaki ezinengi ezitholakala kuloluhlelo, loluphenyo lufuna ukujula kabanzi lubheke eminye imisebenzi eyenziwayo ukuqhuba inhlelo zokuqaphela ngokukhula(growth monitoring) ezigabeni. Lokhu kwenziwa kukhangelwe umlandu walabo abanakekela abantwana abangaphansi kweminyaka emihlanu. Loluphenyo luhlose ukuphuma lendlela ezasetshenziswa (index) ukungconoza ukuhlelwa kwezempilakahle zabantwana ezabelweni. Ucelwa ukuthi uphatheke kuloluphenyo “A growth Monitoring and Promotion Index to improve Child health in Umguza District in Zimbabwe” ngoba ulakho ukusinika imibono engasetshenziswa ukuze kubunjwe lindlela (iGMP index). Imvumo yokwenza loluphenyo sizayicela kugatsha lweMedical Research Council of Zimbabwe, lase HCTREC ese University of Venda leProvincial Medical Directorate for Matabeleland North Province.

Indlela okuzaqhutshwa ngayo

Ukhetshiwe ukuthi uphatheke kuloluphenyo. Ungacelwa ukuthi kubelomuntu okubuzwa imibuzo wena uphendula, ukuphendula imibuzo elotshwe phansi kumbe njalo uphatheke lapho okubuzwa khona imibuzo abantu beliqenjani (Focus Group Discussions). Imibuzo ebuzwa ngumuntu kugaqela leyo

ebhalwe phansi kungathatha imizuzu eyi 40 yesikhathi sakho. Kusetshenziswa abezempilakahle esigabeni, kuzahlelwa isikhathi sokuhlangana lomunye walowo lalowo ozaphatheka kuloluphenyo kungakenziwa ingxoxo ezihleliweyo.

Okungaphatha kubi lowo ohlanganyele kuloluphenyo:

Kakukhangelelwanga ukuthi kungaba lengozi yokulimala kumbe okunye njalo okuphambanisayo okungabangelwa yikuphatheka kulesisifundo njengoba kungelakwelatsha muntu. Okudingekayo nje yikuphendula leyo mibuzo eyabe ibuziwe. Nxa umumo onje ungenzeka, uzacelwa ukuthi uyekele ukuphatheka ubususiwa esibhedlela sabezemilakahle ukuze uthole usizo oluvela kwabalolwazi lokweluleka lokunakekela.

Inzuzo

Kakulanzuzo ezabuya iqondene lalowo ophatheke kusifundo kodwa iGMP index ingabakhona izangconozisa ezempilakahle zabantwana lokudla obakudlayo. Kawusoze ubhadalwe ukuba yingxenye yalesisifundo ngesikhathi kulondwa ulwazi (data)

Izizatho ezingenza ophathekayo acine emisiwe ukuba yingxenye yalesisifundo

Ukuphatheka kuloluhlelo kuya ngokuzithandela. Ukukhetha ukungaphatheki kakusoze kuphambanise ubudlelwano bakho lophenyayo kumbe njalo yiloba ngubani oyingxenye yekuhloleni ngezokukhula kwabantwana abangaphansi kweminyaka emihlanu. Ukhululekile njalo ukwesula isivumelwano osisayine ngaphambilini yiloba yisiphi isikhathi unxa ungasaphatheki kuphenyo. Uzakhitshwa ekubeni yingxenye yophenyo nxa ungalandeli izimiso ezifakiweyo kumbe nxa ukuziphatha kwakho kuphambanisa uphenyo kumbe abanye abaphatheke kuloluphenyo. Nxa suthe waphuma kumbe wakhitshwa kulesisifundo kakulasigwebo ozabhekana laso.

Ezembadalo

Kakulambadalo ukuba yingxenye yaloluphenyo lapho kudingwa ulwazi(data)

Indleko zophenyo

Kakulandleko ezizadingeka ngokuphatheka kuloluphenyo

Imfihlo

Ophathekayo kasoze aziwe ukuthi ngubani, bazanikezwa inombolo ezingasoze zilandelelwe ukuthi beziphiwe bani. Ulwazi olutholakeleyo luzagcinwa luyimfihlo lusaziwa kuphela ngophenyayo labathungameli bakhe. Lokhu okutholakeleyo kuzasetshenziswa kuphela kwezemfundo. Kodwa ke nxa uvume ukuphatheka kulesisifundo ngokusayina lumbhalo, sihlele ukwazisa ugatsha lwabezempilakahle lokunakekelwa kwabantwana (Ministry of Health and Child Care). Kakula lwazi oluzabe lutholakale kuloluphenyo oluzakhomba ukuthi luvele kuwe.

Ukulimala okungavela ngenxa yophenyo

Kakulakulimanga okukhangelelwe ukuthi kungenzeka kuloluphenyo njengoba lugoqela ukuphendula imibuzo ebuziweyo kuphela. **Buza imibuzo**

Ungakasayini lifomu buza okunye ongabe ungakuzwisi, Ungathatha isikhathi eside ukucabangisisa lokhu.

Ongabathinta nxa usuhlangene lenkinga thize kumbe ulemibuzo:

Thintana lomphenyi uShamiso Alice Dzumbunu (+263773507044), my supervisor Dr NS Mashau kumbe iUniversity Research Ethics Committee Secretariat kunombolo ezithi+2715 962 9058. Insolo zingahanjiswa kokhokheleyo (Director): Research and Innovation, Prof GE Ekosse kulezi inombolo +2715 962 8313 kumbe Georges Ivo.Ekosse@univen.ac.za, Medical Research Council of Zimbabwe, 20 Cambridge Road, Avondale, Harare. Telephone: 263 791792/ 79 11 93 or 08644073772

Okunye nje:

Labo abakhanya engathi bengaphatheka ehlelweni kumele baziswe ukuthi lokhu kwenziwa ngokuzithandela njalo kumele kwaziswe inani labantu abadingakalayo kulolophenyo. Ikhophi yencwadi elombiko ngophenyo kumele iphiwe abaphatheke ehlelweni. Ugwalo oluqukethe umbiko kanye lencwadi edinga imvumo kumele kunikwe labo abaphathekayo njalo lokhu kumele kuhumutshelwe elimini lwalabo abazaphatheka.

Imvumo

Isivumelwano esiphawula ukuvuma ukuphatheka ehlelweni lokuphenya

- Nginyaqinisa ukuthi ngazisiwe ngophenyayo (*Ibizo lalowo ophenyayo*) ngesimo, ukuziphatha, inzuzo kanye lengozi eziphathelele lesisifundo- Research Ethics Clearance Number: FHS/21/PH/23/0511,
- Ngitholile, ngabala njalo ngazwisisa okulotshwe ngaphambili (*Participant Letter of Information*) okuphathelele lesisifundo esenziwayo.
- Ngiyazi ukuthi impumela yalesisifundo kugoqela okuphathelele lobulili bami, iminyaka, ilanga lokuzalwa, isiqalo sebizo lempumela kuzalungiswa kuhlelwe kungaqondaniswa lami kulolophenyo.
- Nxa kulandelwa indingeko zaloluphenyo ngiyavuma ukuthi ulwazi(idatha) olutholakeleyo phakathi kwalesisifundo luhlelwe kusetshenziswa ikhompuyutha ngumpheni.
- Kungenzeka ukuthi ngiphume ekuphathekeni kulesisifundo kungelansolo thize laloba uphenyo lukusiphi isibanga.
- Ngitholile ithuba eleneleyo ukuthi ngibuze imibuzo (ngokuthanda kwami) kungakho ngilungele ukuphatheka kulesisifundoNgiyazwisisa ukuthi okutsha okungabe kutholakele kusenziwa loluphenyo okuqondana lokuphatheka kwami ngizakwaziswa.

Ibizo lophathekayo ngokugcweleyo:

Ilanga

Isikhathi:

Sayina lapha

Mina,.....

(Ibizo lomphenyi) ngiyaqinisa ukuthi umuntu lo ophathekileyo kuphenyo wazisiwe ngokugcweleyo'
Wazisiwe ngohlobo lophenyo kugoqela, indlela yokuziphatha lengozi ezingabakhona.

Ibizo lomphenyi ngokugcweleyo
Sayina lapha

Ilanga

Ibizo lofakazi ngokugcweleyo (Nxa kudingeka).....
Sayina lapha.....

Ilanga

Appendix 10: CHW Monthly GMP Tool: English Version

Questionnaire for Community Health Workers

CHW Survey – Umguza District, 2022

Questionnaire Number _____

A. Background Information of CHW

1. Date of Interview	D/M/Y _____
2. Ward	
3. Age of CHW in years	_____ years
4. Sex of CHW	1=Male 2=Female
5. Education level	1=no formal education, 2=Adult education 3=some primary education, 4=completed primary education, 5=some vocational training, 6=completed vocational training, 7=some secondary education, 8=completed secondary education, 9=College education 10=University education, 11=Other _____
6. Marital status	1=Single, 2=Monogamously married, 3=Polygamous married, 4=Widowed, 5=Separated/Divorced, 6=Other (Specify)
7. Name of clinic CHW reports to:	
8. Village	
9. Number of villages supported by CHW	
10. Distance to furthest household in the village	_____ kms
11. Number of children under 5 years monitored monthly- as per CHW register	
12. Number of hours/day spent on CHW activities	
13. Number of hours/week spent on CHW activities	
14. Do you have a weighing scale?	1=Yes 2=No
15. Do you have a MUAC tape?	1=Yes 2=No
16. Do you have a functional bicycle?	1=Yes 2=No

17. Do you have adequate IEC materials e.g IYCF Counselling Cards?	1=Yes	2=No
18. What other roles does a CHW do in the community?		
19. How much is your allowance per quarter?	a) Less than USD20 b) USD20-USD50 c) more than USD50	

B. GMP Routine activities done

What GMP activities do you do? <i>(Tick all that apply)</i>			
Frequency of activity	Weekly	Bi-monthly	Monthly
a. Weight measurements			
b. MUAC measurements			
c. Vitamin A supplementation referral to health facility			
d. Individual or one-on-one IYCF counselling of mother or father/caregiver			
e. Conducting c-IYCF Support group meeting			
f. Other activity - Specify			

C. Knowledge of GMP aspects

a. What does the color RED mean on the MUAC tape?	<ol style="list-style-type: none"> 1. Severe malnutrition 2. Moderate malnutrition 3. No malnutrition 4. Don't know
b. What does the color YELLOW mean on the MUAC tape?	<ol style="list-style-type: none"> 1. Severe malnutrition 2. Moderate malnutrition 3. No malnutrition 4. Don't know
c. What does the color GREEN mean on the MUAC tape?	<ol style="list-style-type: none"> 1. Severe malnutrition 2. Moderate malnutrition 3. No malnutrition 4. Don't know
d. What is Exclusive breastfeeding?	<ol style="list-style-type: none"> 1. Feeding a baby 0-5 months breastmilk only along with any prescribed medications 2. Don't know
e. Exclusive breastfeeding is applicable to which age group?	<ol style="list-style-type: none"> 1. 0-5 months 2. 7-11 months 3. 12-23 months 4. 24-60 months 5. Don't know
f. What is complementary feeding?	<ol style="list-style-type: none"> 1. Feeding a baby from 6 months solid or semi-solid foods along with breastmilk. 3. Don't know
g. Complementary feeding is applicable to which age groups?	<ol style="list-style-type: none"> 1. 0-5 months 2. 7-11 months 3. 12-23 months 4. 24-60 months 5. Don't know
h. What is oedema?	<ol style="list-style-type: none"> 1. Swelling caused by fluid accumulation in parts of the body 2. Don't know
i. What is wasting?	<ol style="list-style-type: none"> 1. Refers to when a child is too thin for his/her height (low weight-for-height) 2. Don't know
j. What is the recommended frequency of vitamin A supplementation for children under 5 years?	<ol style="list-style-type: none"> 1. Once a year 2. Twice a year 3. Monthly 4. Don't know

D. Any Recommendations for the improvement of the GMP activities as conducted by CHWs

I. _____

ngeviki		
14. Ulesikali sokukala?	1=Yebo	2=Hatshi
15. Ulayo yini iMUAC tape?	1=Yebo	2=Hatshi
16. Ulebhayisikili olisebenzayo?	1= Yebo	2= Hatshi
17. Ulakho yini okokuhambisa imibiko okwaneleyo okunjengamakhadi okucebisa aweIYCF?	1=Yebo	2= Hatshi
18. Yiphi eminye imisebenzi eyenziwa nguCHW esabelweni?		
19. Uphywa malini ngemva kwenyanga ezintathu?		

B. Imisebenzi ye Growth Monitoring lePromotion evame ukwenziwa

Yiyiphi imisebenzi ye Growth Monitoring lePromotion evame ukwenziwa? (Bhala konke okufaneleyo)			
Umsebenzi wenziwa kangaki	Ngeviki	Kanye ngenyanga ezimbili	Ngenyanga
a. Izilinganiso sesisindo			
b. Izilinganiso ze MUAC			
c. Isengezo seVitamin A esidluliselwa esibhedlela			
d. Ukucebisa kweIYCF komuntu ngamunye ngamunye okukamama kumbe ubaba/ onakekela abantwana			
e. Ukwenza umhlangano weIYCF support group			
f. Eminyane imisebenzi- Chasisa			

C. Ulwazi ngeGrowth Monitoring lePromotion	
k. Umbala obomvu utshoni kuMUAC tape?	<ol style="list-style-type: none"> 5. Ukuswela ukudla okwakha umzimba okusesibangeni esibi 6. Ukuswelaukudla okwakha umzimba okunganeno 7. Akula kusweleka kokudla okwakha umzimba 8. Angazi
l. Umbala olithanga utshoni kuMUAC tape?	<ol style="list-style-type: none"> 1. Ukuswela ukudla okwakha umzimba okusesibangeni esibi 2. Ukuswelaukudla okwakha umzimba okunganeno 3. Akula kusweleka kokudla okwakha umzimba 4. Angazi
m. Umbala oluhlaza utshoni kuMUAC tape?	<ol style="list-style-type: none"> 1. Ukuswela ukudla okwakha umzimba okusesibangeni esibi 2. Ukuswelaukudla okwakha umzimba okunganeno 3. Akula kusweleka kokudla okwakha umzimba 4. Angazi
n. Kuyini ukumunyisa ingane ngokukhethekileyo?	<ol style="list-style-type: none"> 1. Ukumunyisa umntwana kuphela (kusukela kunyanga 0-5) aphiwe Kanye nike lemithi ebhalwe ngudokotela 2. Angazi
o. Ukumunyisa kungela okunye okuphiwa umntwana kwenziwa ebantwaneni abaleminyaka emingaki?	<ol style="list-style-type: none"> 1. Inyanga ezingu 0-5 2. Inyanga ezingu 7-11 3. Inyanga ezingu 12-23 4. Inyanga ezingu 24-60 5. Angazi
p. Kuyini ukwengezelela ukudla?	<ol style="list-style-type: none"> 1. Ukunika usane nxa selulenyanga ezingu 6 ukudla okujijileyo ndawonye lebele. 2. Angazi
q. Ukwengezelela ukudla kwenziwa ebantwaneni asebengakanani?	<ol style="list-style-type: none"> 1. Inyanga ezingu 0-5 2. Inyanga ezingu 7-11 3. Inyanga ezingu 12-23 4. Inyanga ezingu 24-60 5. Angazi
r. Kuyini ioedema?	<ol style="list-style-type: none"> 1. Ukuvuvuka okubangelwa ngamanzi atholakala kwezinye izitho zomzimba 2. Angazi
s. Kuyini ukuzaca lokungakhuli kahle komntwana?	<ol style="list-style-type: none"> 3. Kutsho nxa umntwana ecake kakhulu emfitshane (isilinganiso somzimba – lobude bakhe) 4. Angazi
t. Abantwana abaleminyaka engaphansi kwengu 5 kumele baphiwe kangaki uvitamin A?	<ol style="list-style-type: none"> 1. Kanye ngomnyaka 2. Kabili ngomnyaka 3. Kanye ngenyanga 4. Angazi

D. Kukhona yini okunye obona engathi kungenziwa ukungconozisa imisebenzii yeGMP eyenziwa ngamaCHW?

II. _____

III. _____

Appendix 12: Questionnaire for caregivers of CU5: English Version

Group: Doer Non-Doer

Barrier Analysis Questionnaire: Growth Monitoring and Promotion- caregivers of CU5

Behavior Statement

Caregivers of children 0 – 59 months attend monthly GMP activities conducted by their CHWs.

Demographic Data

Interviewer's Name: _____ Questionnaire No.: _____ Date ____ / ____ / ____

Ward: _____

Scripted Introduction:

Hi, my name is _____; and I am part of a study team looking into the growth monitoring and promotion of children under five years.

[share Information sheet and consent form]

Would you like to participate in the study? [If not, thank them for their time.]

Section A. Behavior Screening Questions

1. How old is your youngest child? _____ months ← *write the age in months*
 - a. 0-59 months
 - b. >59 months → *End interview and look for another respondent*
 - c. Don't know → *End interview and look for another respondent*
2. Last month, did you attend growth monitoring and promotion activities?
 - a. Yes
 - b. No → *Mark as Non-doer and continue to Section B*
 - c. Don't remember → *End interview and look for another respondent*
3. I would like you to reflect on the past 6 months and tell me how many times you attended growth monitoring and promotion activities with your child. _____ (*this is just to help with memory*)
4. In the past 6 months, how many times did you attend growth monitoring and promotion activities with your child? (DO NOT READ THE LIST – Mark all that are mentioned)
 - a. None
 - b. Once
 - c. 2 times
 - d. 3 times
 - e. 4 times or more
 - f. Don't know or won't say → *End interview and look for another respondent*
5. Was your child weighed by the CHW in the past 6 months?
 - a. Yes
 - b. No → *Mark as Non-doer and continue to Section B*
 - c. Don't remember → *End interview and look for another respondent*

6. In addition to your child being weighed by the CHW, what other activity related to GMP did the CHW conduct with you?
- a. Growth-informed counselling
 - b. Anything else → *Mark as Non-doer and continue to Section B*
 - c. Don't know/refused to answer → *End interview and look for another respondent*

7. May I see the child's 'Road to Health' card?
- a. Card available and weight is plotted
 - b. Card available but weight is not plotted → *Mark as Non-doer and continue to Section B*
 - c. No card available → *Mark as Non-doer and continue to Section B*

Doer (all of the following)	Non Doer (any one of the following)	Do not Interview (any one of the following)
Question 1 – A		Question 1 -C
Question 2 – A	Question 2 – B	Question 2 – C
Question 4 - A plus any two from B, C, D, E ¹	Question 4 – No A; or A and only one other response between B, C, D, E	Question 4 -C
Question 5 – A	Question 5 – B	Question 5 - C
Question 6 – A	Question 6 - B	Question 6 - C
Question 7-A	Question 7- B or C	

GROUP: **DOER** **NON-DOER**

Behavior Explanation: In the following questions I am going to be talking about the GMP activities as conducted by CHWs monthly. By this I mean 1. Taking child for monthly weight measurements, 2. Discussing with CHW about child's nutritional status, 3. Adopting and practicing at home any IYCF recommendations given by CHW.

¹ This is an example of how to relax a behavior when you don't think you'll be able to find enough 'Doers'.

Section B – Research Questions

(Perceived Self-efficacy)

1. With your current knowledge, skills and resources do you think you can attend monthly GMP activities conducted by CHWs in your community?

- a. Yes
- b. No
- c. Maybe
- d. Don't know/ Won't say

2a. **Doers:** What makes it **easier** for you to attend GMP activities conducted by CHWs in your community.

2b. **Non-doers:** What would make it **easier** for you to attend GMP activities conducted by CHWs in your community.

(Write all responses below. Probe with "What else?")

(Perceived Self-efficacy)

3a. **Doers:** What makes it **difficult** for you to attend GMP activities conducted by CHWs in your community?

3b. **Non-doers:** What would make it **difficult** for you to attend GMP activities conducted by CHWs in your community?

(Write all responses below. Probe with "What else?")

(Perceived Positive Consequences)

4a. **Doers:** What are the **advantages** of attending GMP activities conducted by CHWs in your community?

4b. **Non-doers:** What would be the **advantages** of attending GMP activities conducted by CHWs in your community?

(Write all responses below. Probe with "What else?")

(Perceived Negative Consequences)

5a. **Doers:** What are the **disadvantages** of attending GMP activities conducted by CHWs in your community?

5b. **Non-doers:** What would be the **disadvantages** of attending GMP activities conducted by CHWs in your community?

(Write all responses below. Probe with "What else?")

(Perceived Social Norms)

5a. **Doers:** Who are the people that **approve** of you attending GMP activities conducted by CHWs in your community?

5b. **Non-doers:** Who are the people that **would approve** of you attending GMP activities conducted by CHWs in your community?

(Write all responses below. Probe with "Who else?")

(Perceived Social Norms)

6a. **Doers:** Do most of the people that you know approve of you attending GMP activities conducted by CHWs in your community?

6b. **Non-doers:** Would most of the people that you know approve of you attending GMP activities conducted by CHWs in your community?

- a. Yes
- b. Possibly
- c. No

d. Don't Know / Won't say

(Perceived Social Norms)

7a. Doers: Who are the people that **disapprove** of you attending GMP activities conducted by CHWs in your community?

7b. Non-doers: Who are the people that **would disapprove** of you attending GMP activities conducted by CHWs in your community?

(Write all responses below. Probe with "Who else?")

(Perceived Access)

8a. Doers: How difficult is it to attend GMP activities conducted by CHWs in your community? Would you say it is very difficult, somewhat difficult or not difficult at all?

8b. Non-doers: How difficult would it be to attend GMP activities conducted by CHWs in your community? Would you say it is: Very difficult, somewhat difficult, not difficult at all?

a. Very difficult

b. Somewhat difficult

c. Not difficult at all.

(Perceived Cues for Action / Reminders)

9a. Doers: How difficult is it to remember to attend GMP activities conducted by CHWs in your community? Very difficult, somewhat difficult, or not difficult at all?

9b. Non-doers: How difficult do you think it would be to remember to attend GMP activities conducted by CHWs in your community? Very difficult, somewhat difficult, or not difficult at all?

a. Very difficult

b. Somewhat difficult

c. Not difficult at all.

d. Don't Know/Won't say

(Perceived Susceptibility / Perceived Risk)

10. Doers and Non-doers: How likely is it that your child will be underweight in the coming 3 months ? Very likely, somewhat likely, or not likely at all?

a. Very likely

b. Somewhat likely

c. Not likely at all

(Perceived Severity)

11. Doers and Non-doers: How serious would it be if your child became underweight?

A very serious problem, somewhat serious problem, or not serious at all?

a. Very serious problem

b. Somewhat serious problem

c. Not serious at all

(Action Efficacy)

12. Doers and Non-doers How likely is it that your child will become underweight if you do not attend GMP activities conducted by CHWs in your community? Very likely, somewhat likely, not very likely?

a. Very likely

b. Somewhat likely

c. Not likely at all

(Perception of Divine Will)

13a. Doers and Non-doers: Do you think that it's **God will** that children become underweight diarrhea?

- a. Yes
- b. No
- c. Don't Know / Won't say

(Culture)

14. Doers and Non-doers: Are there any cultural rules or taboos against attending GMP activities conducted by CHWs in your community?

- a. Yes
- b. No
- c. Don't Know / Won't say

(Policy)

15. Doers and Non-doers : Are there any community laws or rules in place that make it more likely that you attend GMP activities conducted by CHWs in your community?

- a. Yes
- b. No
- c. Don't Know / Won't say

[Now I am going to ask you a question unrelated to GMP.]

(Universal Motivators)

16. Doers and Non-doers: What is the one thing that you desire most in life?

THANK THE RESPONDENT FOR HIS or HER TIME!

Appendix 13: Questionnaire for CU5 caregivers: isiNdebele Version

Imibuzo yalabo abanakekela abanye abe 5 years

Iqembu: Osebenzayo___ Ongasebenziyo___

Imibuzo ecubungula ngemigoqo ekhona:

Indlela zokuhlolisisa lokukhuthaza ukukhula-abanakekela abantwana abe CU5

Umutsho otshengisa ukuziphatha

Abanakekela abantwana abalenyanga ezingu 0-59 kumele bangene imihlangano yokuhlolisisa lokukhuthaza ukukhula komntwana eyenziwa ngama CHWs abo.

Okuphatelane lomuntu

Ibizo lalo obuza imibuzo: _____ Inani loluhlu lwemibuzo: ___/___/___
Ilanga: _____

Isigaba: Umguza

Iwadi: _____

Isingeniso esibhaliweyo: Igama lami ngu _____; ngingomunye weqembu elikhangele ngokuhlolisisa lokukhuthaza ngokukhula kwabantwana abaleminyaka engaphansi kwemihlanu.

[Mnike iphepha elilolwazi lefomu yokuvuma ukuphatheka]

Ungafisa yini ukuphatheka kulokhu kuchwayisisa? [Nxa engafuni mbonge ngesikhathi sakhe]

Sahluko A. Imibuzo ehlola ngokuziphatha komuntu

8. Umntanako omncane uleminyaka emingaki?-----inyanga- Bhala iminyaka yakhe ngenyanga

a. Inyanga ezingu 0-59

b. *Inyanga ezingaphezu kwe 59- ungasabuzi imibuzo dinga omunye ongambuza*

c. Angikwazi- *ungasabuzi imibuzo dinga omunye ongambuza*

9. Kunyanga ephelileyo ukewaba semihlanganweni yokuhlolisisa lokukhuthaza ngokukhula komntwana?

a. Yebo

b. *Hatshi- Bhala njengomuntu*

ongenziyo ubusuqhubeka usiya kusahluko B

c. Angisakhumbuli - *ungasabuzi imibuzo dinga omunye ongambuza*

10. Ngizathanda ukuthi ucabangisise ngenyanga ezingu 6 ezedluleyo ubusungitshela ukuthi wangena kangaki imihlangano ekhangele ngokuhlolisisa lokukhuthaza ngokukhula komntwana, laye umntanako _____ (lokhu yikuzama ukuncedisa umuntu ukuthi akhumbule)

11. Kunyanga ezingu 6 ezedluleyo, ukewangena imihlangano ekhangele ngokuhlolisisa lokukhuthaza ngokukhula komntwana, ulaye umntanako? (UNGABALI OKUBHALIWEYO- Tshengisa konke okuqanjwayo)

- a. Angikaze
- b. Kanye
- c. Kabili
- d. Kathathu
- e. Okwamahlandla amane kumbe adlula lapho
- f. Angisakhumbuli - *ungasabuzi imibuzo dinga omunye ongambuza*

12. Umntanako wafakwa esikalini ngu CHW kunyanya ezingu 6 ezedluleyo?

- a. Yebo
- b. *Hatshi- Bhala njengomuntu ongakwenziyo ubusuqhubeka usiya kusahluko B*
- c. Angisakhumbuli - *Ungasabuzi imibuzo dinga omunye ongambuza*

13. Ngaphandle kokuthi UCHW afake umtanako esikalini kuyini okunye okuphathelane le GMP akwenza lawe uCHW

- a. Kwezokukhula- ukucetshiswa okulolwazi
- b. Kungabe kukhona yini okunye – Bhala uthi kenzi lutho ubusudlulela kusahluko B
- c. Angazi/ wala ukuphendula--- *Ungasabuzi imibuzo dinga omunye ongambuza*

14. Ngicela ukubona ikhadi lomntanako elitshengisa indlela yakhe yempilakahle?

- a. Ikhadi likhona njalo kuyatshengisa ukuthi utshaya ngaki esikalini
- b. Ikhadi likhona kodwa akutshengisi ukuthi uke wakalisa umntwana --- *Bhala uthi kenzi lutho ubusudlulela kusahluko B*
- c. *Ikhadi alikho ----Bhala uthi akwenziwa ubusudlulela kusahluko B*

Owenzayo (konke okulandelayo)	Ongenzi lutho (iloba yikuphi kwalokhu)	Ungambuza (kungaba ngokunye kwalokhu)
Umbuzo 1-A		Umbuzo 1-C
Umbuzo 2-A A	Umbuzo 2-B A	Umbuzo 2-C A
Umbuzo 4-A lokunye okubili ku B, C, D, E A	Umbuzo 4- Hatshi A; kumbe u A lokunye okungavela ku B, C, D, E	Umbuzo 4- C A
Umbuzo 5-A A	Umbuzo 5---B A	Umbuzo 5-C A
Umbuzo 6-A A	Umbuzo 6—B A	Umbuzo 6-C A
Umbuzo 7-A A	Umbuzo 7—B kumbe C kumbe A	

IQEMBU: OWENZA OKUTHILE_____ ONGENZI LUTHO_____

Ingcazelo ngokuziphatha komuntu: Emibuzweni elandelayo ngizabe ngikhuluma ngokwenziwa ku GMPkusenziwa ngo CHW nyanga zonke. Ngalokhu ngitsho ukuthi 1. Ukuhambisa umntwana esikalini nyanga zonke, 2. Ukuxoxisana lo CHW ngesimo



somntwana ekutholeni ukudla okwakha umzimba, 3. Ukwenza konke okucetshiswe ngu CHW okwe IYCF, ngekhaya.

Isahluko B- Imibuzo yokuchwayisisa

(Ukucabangela ukuthi uyanelisa ukwenza okuthile)

1. Ngolwazi olalo khathesi, ubuciko lengcebo olayo ubona engathi ungabakhona emisebenzini ye GMP eyenziwa ngo CHW esigabeni sakini, nyangazonke?

- a. Yebo
- b. Hatshi
- c. Mhlawumbe
- d. Angazi/ Angisoze ngitsho

2a. **Abalokuthile abakwenzayo:** Kuyini okwenza **kube lula** ukuthi ubekhona emihlanganweni ye GMP eyenziwa ngo CHW esigabeni sakini?

2b. **Labo abangenzi lutho :** Kuyini okungenza **kube lula** ukuthi ungene imihlangano yeGMP eyenziwa ngoCHW esigabeni sakini?
(Bhala zonke impendulo ngaphansi. Buzisisa “ngokunye okungabakhona”

(Ocabangela ukuthi ungakwenza)

3a. **Labo abalokuthile abakwenzayo:** Kuyini okwenza kube nzima kuwe ukuthi ungene imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?

3b. **Labo abangenzi lutho:** Kuyini okungenza **kube nzima** kuwe ukungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?
(Buza ngokunye okungabakhona)

(Okucabangela ukuthi kungaba yimpumela enhle)

4a. **Labo abalokuthile abakwenzayo:** Kuyini **okuhle** ngokungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?

4b. **Labo abangenzi lutho:** Kuyini okungaba **kuhle** ngokungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?
(Bhala zonke impendulo ngaphansi. Buzisisa ngokuthi “kuyini okunye”

(Okucabangela ukuthi kungaba lempumela embi)

5a. **Labo abalokuthile abakwenzayo:** Kuyini okubi ngokungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?

5b. **Labo abangenzi lutho:** Kuyini okungaba **kubi** ngokungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini?
(Bhala zonke impendulo ngaphansi. Buzisisa ngokuthi “kuyini okunye”

(Okwemikhuba okucatshangelwayo)

5a. **Labo abalokuthile abakwenzayo:** Ngobani abavumayo ukuthi ungene enhlelweni zeGMP ezenziwa ngo CHW esigabeni sakini?

5b. Labo abangenzi lutho: Ngobani abangavuma ukuthi ungene enhlelweni ze GMP ezenziwa ngo CHW esigabeni sakini?
(*Bhala zonke impendulo ngaphansi. Buzisisa ngokuthi “kuyini okunye”*)

(*Okwemikhuba okucatshangelwayo*)

6a. Labo abalokuthile abakwenzayo: Abantu abanengi obaziyo bayakusekela yini ukungena kwakho inhlelo zeGMP ezenziwa ngo CHW esigabeni sakini?

6b. Labo abangenzi lutho: Kambe abantu abanengi obaziyo bangasekela yini ukungena kwakho inhlelo zeGMP ezenzia ngo CHW esigabeni sakini?

- a. Yebo
- b. Mhlawumbe
- c. Hatshi
- d. Angazi/ Angisoze ngitsho

(*Okwemikhuba okucatshangelwayo*)

7a. Labo abalokuthile abakwenzayo: Ngobani abavumelani lokukungena kwakho inhlelo zeGMP ezenziwa ngo CHW esigabeni sakini?

7b. Labo abangenzi lutho: Ngobani abangeke bavumelana lokungena kwakho inhlelo ze GMP ezenziwa ngo CHW esigabeni sakini?
(*Bhala zonke impendulo ngaphansi. Buzisisa ngokuthi “kuyini okunye”*)

(*Okucatshangelwa ukuthi umuntu uyakuthola*)

8a. Labo abalokuthile abakwenzayo: Kunzima kanganani ukuthi ungene inhlelo zeGMP ezenziwa ngo CHW esigabeni sakini? Ungathi kunzima kakhulu, kunzinyana kumbe akunzima ngitsho?

8b. Labo abangenzi lutho: Kungaba nzima kanganani ukuthi ungene enhlelweni ze GMP ezenziwango CHW esigabeni sakini? Ungathi kunzima kakhulu, kunzinyana kumbe akunzima ngitsho?

- a. Kunzima kakhulu
- b. Kunzinyana
- c. Akunzima ngitsho

(*Okucatshangelwa ukuthi kungenziwa ngabantu/ Izikhumbuzo*)

9a. Labo abalokuthile abakwenzayo: Kunzima kanganani ukukhumbula ukuthi kumele ungene imihlangano ye GMP eyenziwa ngoCHW esigabeni sakini? Kunzima kakhulu, kunzinyana kumbe akunzima ngitsho?

9b. Labo abangenzi lutho: Ucabanga ukuthi kungaba nzima kangani ukukhumbula ukuthi ungene inhlelo zeGMP ezenziwa ngo CHW esigabeni sakini? Kunzima kakhulu, kunzinyana kumbe akunzima ngitsho?

- a. Kunzima kakhulu
- b. Kunzinyana
- c. Akunzima ngitsho
- d. Angazi/ Angisoze ngikhulume

(Ingozi ezicatshangelwayo)

10. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Kungenzakala yini ukuthi umntanakho ehle isisindo esikhangelelweyo kunyanga ezintathu ezizayo? Kungenzakala sibili, mhlawumbe kungaba njalo, akungeke kwenzakale ngitsho

- a. **Kungenzakala sibili**
- b. **Mhlawumbe kungaba njalo**
 - c. **Akungeke kwenzakale ngitsho**

(Okucatshangelwa ukuthi kungaba kubi kakhulu)

11. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Kungaba kubi kanganani umntanakho engehla isisindo esikhangelelweyo? Kungaba luhlupho kakhulu, kungaba nzinyana, akungeke kube nzima ngitsho?

- a. Kungaba luhlupho olukhulu
- b. Kungaba nzinyana
- c. Akungeke kube nzima ngitsho

(Ozitshela ukuthi uzakwenzayo)

12. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Kungenzakala yini ukuthi isisindo somntanakho singehla nxa ungayekela ukungena imihlangano ye GMP eyenziwa ngo CHW esigabeni sakini? Kungenzakala sibili, engxenye kungaba njalo, akungeke kwenzakale?

- a. Kungenzakala sibili
- b. Engxenye kungaba njalo
- c. Akungeke kwenzakale

(Okucatshangelwa ngentando kaMlimu)

13a. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Ucabanga ukuthi kuyintando kaMlimu ukuthi abantwana bacake ngenxa yesihudo?

- a. Yebo
- b. Hatshi
- c. Angazi/ Angisoze ngitsho

(Amasiko)

14. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Ikhona yini imithetho yamasiko kumbe okuzilayo ngokungena enhlelweni ze GMP ezenziwa ngo CHW esigabeni sakini?

- a. Yebo
- b. Hatshi
- c. Angazi/ Angisoze ngitsho

(Imithetho)

15. Labo abalokuthile abakwenzayo lalabo abangenzi lutho: Ingaba khona yini imithetho kumbe izimiso zesigaba ezingenza ukuthi ungene inhlelo zeGMP ezenziwa ngo CHW esigabeni sakini?

- a. Yebo
- b. Hatshi
- c. Angazi/ Angisoze ngitsho

[Khathesi ngizakubuza umbuzo ongaphathelananga le GMP]

(Okukhuthaza abantu indawo zonke)

16. Labo abalokuthile abakwenzayo lalabo *abangenzi lutho*: Kuyini okukodwa okufisayo empilweni yakho?

MBONGE LO OBEPHENDULA IMIBUZO NGOKUCHITHA ISIKHATHI SAKHE ELAWE!



Appendix 14: Author Guidelines-PLOS Global Public Health Journal

File format	<p>Manuscript files can be in the following formats: DOC, DOCX, or RTF. Microsoft Word documents should not be locked or protected.</p> <p>LaTeX manuscripts must be submitted as PDFs. Read the LaTeX guidelines.</p>
Length	<p>Manuscripts can be any length. There are no restrictions on word count, number of figures, or amount of supporting information.</p> <p>We encourage you to present and discuss your findings concisely.</p>
Font	<p>Use a standard font size and any standard font, except for the font named “Symbol”. To add symbols to the manuscript, use the Insert → Symbol function in your word processor or paste in the appropriate Unicode character.</p>
Headings	<p>Limit manuscript sections and sub-sections to 3 heading levels. Make sure heading levels are clearly indicated in the manuscript text.</p>
Layout and spacing	<p>Manuscript text should be double-spaced.</p> <p>Do not format text in multiple columns.</p>
Page and line numbers	<p>Include page numbers and line numbers in the manuscript file. Use continuous line numbers (do not restart the numbering on each page).</p>
Footnotes	<p>Footnotes are not permitted. If your manuscript contains footnotes, move the information into the main text or the reference list, depending on the content.</p>
Language	<p>Manuscripts must be submitted in English.</p> <p>You may submit translations of the manuscript or abstract as supporting information. Read the supporting information guidelines.</p>
Abbreviations	<p>Define abbreviations upon first appearance in the text.</p> <p>Do not use non-standard abbreviations unless they appear at least three times in the text.</p> <p>Keep abbreviations to a minimum.</p>
Reference style	<p>PLOS uses “Vancouver” style, as outlined in the ICMJE sample references.</p> <p>See reference formatting examples and additional instructions below.</p>
Equations	<p>We recommend using MathType for display and inline equations, as it will provide the most reliable outcome. If this is not possible, Equation Editor or Microsoft’s Insert→Equation function is acceptable.</p> <p>Avoid using MathType, Equation Editor, or the Insert→Equation function to insert single variables (e.g., “$a^2 + b^2 = c^2$”), Greek or other symbols (e.g., β, Δ, or ' [prime]), or mathematical</p>

operators (e.g., \times , \geq , or \pm) in running text. Wherever possible, insert single symbols as normal text with the correct Unicode (hex) values.

Do not use MathType, Equation Editor, or the Insert→Equation function for only a portion of an equation. Rather, ensure that the entire equation is included. Equations should not contain a mix of different equation tools. Avoid “hybrid” inline or display equations, in which part is text and part is MathType, or part is MathType and part is Equation Editor.

Nomenclature Use correct and established nomenclature wherever possible.

<i>Units of measurement</i>	Use SI units. If you do not use these exclusively, provide the SI value in parentheses after each value. Read more about SI units.
<i>Drugs</i>	Provide the Recommended International Non-Proprietary Name (rINN).
<i>Species names</i>	Write in italics (e.g., <i>Homo sapiens</i>). Write out in full the genus and species, both in the title of the manuscript and at the first mention of an organism in a paper. After first mention, the first letter of the genus name followed by the full species name may be used (e.g., <i>H. sapiens</i>).
<i>Genes, mutations, genotypes, and alleles</i>	Write in italics. Use the recommended name by consulting the appropriate genetic nomenclature database (e.g., HGNC for human genes; we strongly recommend using this tool to check against previously approved names). It is sometimes advisable to indicate the synonyms for the gene the first time it appears in the text. Gene prefixes such as those used for oncogenes or cellular localization should be shown in roman typeface (e.g., v-fes, c-MYC).
<i>Allergens</i>	The systematic allergen nomenclature of the World Health Organization/International Union of Immunological Societies (WHO/IUIS) Allergen Nomenclature Sub-committee should be used for manuscripts that include the description or use of allergenic proteins. For manuscripts describing new allergens, the systematic name of the allergen should be approved by the WHO/IUIS Allergen Nomenclature Sub-Committee prior to manuscript publication. Examples of the systematic allergen nomenclature can be found at the WHO/IUIS Allergen Nomenclature site .

Style and Format

Manuscript Organization

Manuscripts should be organized as follows. Instructions for each element appear below the list.

Beginning section	<p><i>The following elements are required, in order:</i></p> <ul style="list-style-type: none"> • Title page: List title, authors, and affiliations as first page of the manuscript • Abstract • Introduction
Middle section	<p><i>The following elements can be renamed as needed and presented in any order:</i></p> <ul style="list-style-type: none"> • Materials and Methods • Results • Discussion • Conclusions (optional)
Ending section	<p><i>The following elements are required, in order:</i></p> <ul style="list-style-type: none"> • Acknowledgments • References • Supporting information captions (if applicable)
Other elements	<ul style="list-style-type: none"> • Figure captions are inserted immediately after the first paragraph in which the figure is cited. Figure files are uploaded separately. • Tables are inserted immediately after the first paragraph in which they are cited. • Supporting information files are uploaded separately.



Refer to our downloadable sample files to ensure that your submission meets our formatting requirements:

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The compiled submission PDF includes low-resolution preview images of the figures after the reference list. The function of these previews is to allow you to download the entire submission as quickly as possible. Click the link at the top of each preview page to download a high-resolution version of each figure. Links to download Supporting Information files are also available after the reference list.

Parts of a Submission

Title

Include a full title and a short title for the manuscript.

Title	Length	Guidelines	Examples
Full title	200 characters	Specific, descriptive, concise, and comprehensible to readers outside the field	Impact of cigarette smoke exposure on innate immunity: A <i>Caenorhabditis elegans</i> model Solar drinking water disinfection (SODIS) to reduce childhood diarrhoea in rural Bolivia: A cluster-randomized, controlled trial
Short title	70 characters	State the topic of the study	Cigarette smoke exposure and innate immunity SODIS and childhood diarrhoea

Titles should be written in sentence case (only the first word of the text, proper nouns, and genus names are capitalized). Avoid specialist abbreviations if possible. For clinical trials, systematic reviews, or meta-analyses, the subtitle should include the study design.

Author list

Authorship

requirements

All authors must meet the criteria for authorship as outlined in the [authorship policy](#). Those who contributed to the work but do not meet the criteria for authorship can be mentioned in the Acknowledgments. [Read more about Acknowledgments.](#)

The corresponding author must provide an ORCID iD at the time of submission by entering it in the user profile in the submission system. [Read more about ORCID.](#)

Author names and affiliations

Enter author names on the title page of the manuscript and in the online submission system.

On the title page, write author names in the following order:

- First name (or initials, if used)
- Middle name (or initials, if used)
- Last name (surname, family name)

Each author on the list must have an affiliation. The affiliation includes department, university, or organizational affiliation and its location, including city, state/province (if applicable), and country. Authors have the option to include a current address in addition to the address of their affiliation at the time of the study. The current address should be listed in the byline and clearly labeled “current address.” At a minimum, the address must include the author’s current institution, city, and country.

If an author has multiple affiliations, enter all affiliations on the title page only. In the submission system, enter only the preferred or primary affiliation. Author affiliations will be listed in the typeset PDF article in the same order that authors are listed in the submission.

Author names will be published exactly as they appear in the manuscript file. Please double-check the information carefully to make sure it is correct.

Corresponding author

The submitting author is automatically designated as the corresponding author in the submission system. The corresponding author is the primary contact for the journal office and the only author able to view or change the manuscript while it is under editorial consideration.

The corresponding author role may be transferred to another coauthor. However, note that transferring the corresponding author role also transfers access to the manuscript. (To designate a new corresponding author while the manuscript is still under consideration, watch the video tutorial below.)

Only one corresponding author can be designated in the submission system, but this does not restrict the number of corresponding authors that may be listed on the article in the event of publication. Whoever is designated as a corresponding author on the title page of the manuscript file will be listed as such upon publication. Include an email address for each corresponding author listed on the title page of the manuscript.

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If a manuscript is submitted on behalf of a consortium or group, include its name in the manuscript byline. Do not add it to the author list in the submission system. You may include the full list of members in the Acknowledgments or in a supporting information file.

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Author contributions

Provide at minimum one contribution for each author in the submission system. Use the CRediT taxonomy to describe each contribution. [Read the policy and the full list of roles.](#)

Contributions will be published with the final article, and they should accurately reflect contributions to the work. The submitting author is responsible for completing this information at submission, and we expect that all authors will have reviewed, discussed, and agreed to their individual contributions ahead of this time.

PLOS Global Public Health will contact all authors by email at submission to ensure that they are aware of the submission.

Cover letter

Upload a cover letter as a separate file in the online system. The length limit is 1 page.

The cover letter should include the following information:

- Summarize the study's contribution to the scientific literature
- Relate the study to previously published work
- Specify the type of article (for example, research article, systematic review, meta-analysis, clinical trial)
- Describe any prior interactions with PLOS regarding the submitted manuscript

IMPORTANT: Do not include requests to reduce or waive publication fees in the cover letter. This information will be entered separately in the online submission system.

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The title, authors, and affiliations should all be included on a title page as the first page of the manuscript file.



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The Abstract comes after the title page in the manuscript file. The abstract text is also entered in a separate field in the submission system.

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While the Abstract is conceptually divided into three sections (Background, Methodology/Principal Findings, and Conclusions/Significance), do not apply these distinct headings to the Abstract within the article file.

Do not include any citations. Avoid specialist abbreviations.

Introduction

The introduction should put the focus of the manuscript into a broader context. As you compose the Introduction, think of readers who are not experts in this field. Include a brief review of the key literature. If there are relevant controversies or disagreements in the field, they should be mentioned so that a non-expert reader can delve into these issues further. The Introduction should conclude with a brief statement of the overall aim of the experiments and a comment about whether that aim was achieved.

Materials and Methods

The Materials and Methods should provide enough detail to reproduce the findings. Submit detailed protocols for newer or less established methods. Well-established protocols may be referenced.

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These sections may all be separate, or may be combined to create a mixed Results/Discussion section (commonly labeled “Results and Discussion”) or a mixed Discussion/Conclusions section (commonly labeled “Discussion”). These sections may be further divided into subsections, each with a concise subheading, as appropriate. These sections have no word limit, but the language should be clear and concise.

Together, these sections should describe the results of the experiments, the interpretation of these results, and the conclusions that can be drawn.

Authors should explain how the results relate to the hypothesis presented as the basis of the study and provide a succinct explanation of the implications of the findings, particularly in relation to previous related studies and potential future directions for research.

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Consult our [reporting guidelines](#), and include an ethics statement in the Materials and Methods section when reporting results from [human subjects research](#) and [animal research](#).

Acknowledgments

Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution.

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Do not include funding sources in the Acknowledgments or anywhere else in the manuscript file. Funding information should only be entered in the financial disclosure section of the submission system.

References

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References are listed at the end of the manuscript and numbered in the order that they appear in the text. In the text, cite the reference number in square brackets (e.g., “We used the

techniques developed by our colleagues [19] to analyze the data”). PLOS uses the numbered citation (citation-sequence) method and first six authors, et al.

Do not include citations in abstracts.

Make sure the parts of the manuscript are in the correct order *before* ordering the citations.

Formatting references

Because all references will be linked electronically as much as possible to the papers they cite, proper formatting of references is crucial.

PLOS uses the reference style outlined by the International Committee of Medical Journal Editors (ICMJE), also referred to as the “Vancouver” style. Example formats are listed below. Additional examples are in the [ICMJE sample references](#).

A reference management tool, EndNote, offers a current [style file](#) that can assist you with the formatting of your references. If you have problems with any reference management program, please contact the source company's technical support.

Journal name abbreviations should be those found in the [National Center for Biotechnology Information \(NCBI\) databases](#). **Supporting information**

Authors can submit essential supporting files and multimedia files along with their manuscripts. All supporting information will be subject to peer review. All file types can be submitted, but files must be smaller than 20 MB in size.

Authors may use almost any description as the item name for a supporting information file as long as it contains an “S” and number. For example, “S1 Appendix” and “S2 Appendix,” “S1 Table” and “S2 Table,” and so forth.

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Example caption

S1 Text. Title is strongly recommended. Legend is optional.

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- A concise, descriptive title

The caption may also include a legend as needed.

[Read more about figure captions](#).

Tables

Cite tables in ascending numeric order upon first appearance in the manuscript file.

Place each table in your manuscript file directly after the paragraph in which it is first cited (read order). Do not submit your tables in separate files.

Tables require a label (e.g., “Table 1”) and brief descriptive title to be placed above the table. Place legends, footnotes, and other text below the table.

[Read the guidelines for tables.](#)

Statistical reporting

Manuscripts submitted to *PLOS Global Public Health* are expected to report statistical methods in sufficient detail for others to replicate the analysis performed. Ensure that results are rigorously reported in accordance with community standards and that statistical methods employed are appropriate for the study design.

Consult the following resources for additional guidance:

- [SAMPL guidelines](#), for general guidance on statistical reporting
- [PLOS Global Public Health guidelines](#), for clinical trials requirements
- [PLOS Global Public Health guidelines](#), for systematic review and meta-analysis requirements
- [EQUATOR](#), for specific reporting guidelines for a range of other study types

Reporting of statistical methods

In the methods, include a section on statistical analysis that reports a detailed description of the statistical methods. In this section:

- List the name and version of any software package used, alongside any relevant references
- Describe technical details or procedures required to reproduce the analysis
- Provide the repository identifier for any code used in the analysis (See our [code-sharing policy](#).)

Statistical reporting guidelines:

- Identify research design and independent variables as being between- or within-subjects
- For pre-processed data:
 - Describe any analysis carried out to confirm the data meets the assumptions of the analysis performed (e.g. linearity, co-linearity, normality of the distribution).
 - If data were transformed include this information, with a reason for doing so and a description of the transformation performed

- Provide details of how outliers were treated and your analysis, both with the full dataset and with the outliers removed
- If relevant, describe how missing/excluded data were handled
- Define the threshold for significance (alpha)
- If appropriate, provide sample sizes, along with a description of how they were determined. If a sample size calculation was performed, specify the inputs for power, effect size and alpha. Where relevant, report the number of independent replications for each experiment.
- For analyses of variance (ANOVAs), detail any post hoc tests that were performed
- Include details of any corrections applied to account for multiple comparisons. If corrections were not applied, include a justification for not doing so
- Describe all options for statistical procedures. For example, if t-tests were performed, state whether these were one- or two-tailed. Include details of the type of t-test conducted (e.g. one sample, within-/between-subjects).
- For step-wise multiple regression analyses:
 - Report the alpha level used
 - Discuss whether the variables were assessed for collinearity and interaction
 - Describe the variable selection process by which the final model was developed (e.g., forward-stepwise; best subset). [See SAMPL guidelines](#).
- For Bayesian analysis explain the choice of prior trial probabilities and how they were selected. Markov chain Monte Carlo settings should be reported.

Reporting of statistical results

Results must be rigorously and appropriately reported, in keeping with community standards.

- **Units of measurement.** Clearly define measurement units in all tables and figures.
- **Properties of distribution.** It should be clear from the text which measures of variance (standard deviation, standard error of the mean, confidence intervals) and central tendency (mean, median) are being presented.
- **Regression analyses.** Include the full results of any regression analysis performed as a supplementary file. Include all estimated regression coefficients, their standard error, p-values, and confidence intervals, as well as the measures of goodness of fit.

- **Reporting parameters.** Test statistics (F/t/r) and associated degrees of freedom should be provided. Effect sizes and confidence intervals should be reported where appropriate. If percentages are provided, the numerator and denominator should also be given.
- **P-values.** Report exact p-values for all values greater than or equal to 0.001. P-values less than 0.001 may be expressed as $p < 0.001$, or as exponentials in studies of genetic associations.
- **Displaying data in plots.** Format plots so that they accurately depict the sample distribution. 3D effects in plots can bias and hinder interpretation of values, so avoid them in cases where regular plots are sufficient to display the data.
- **Open data.** As explained in PLOS's [Data Policy](#), be sure to make individual data points, underlying graphs and summary statistics available at the time of publication. Data can be deposited in a repository or included within the Supporting Information files.

Data reporting

All data and related metadata underlying the findings reported in a submitted manuscript should be deposited in an appropriate public repository, unless already provided as part of the submitted article.

See [instructions on providing underlying data to support blot and gel results](#).

[Read our policy on data availability](#).

Repositories may be either subject-specific (where these exist) and accept specific types of structured data, or generalist repositories that accept multiple data types. We recommend that authors select repositories appropriate to their field. Repositories may be subject-specific (e.g., GenBank for sequences and PDB for structures), general, or institutional, as long as DOIs or accession numbers are provided and the data are at least as open as CC BY. Authors are encouraged to select repositories that meet accepted criteria as trustworthy digital repositories, such as criteria of the Centre for Research Libraries or Data Seal of Approval. Large, international databases are more likely to persist than small, local ones.

[See our list of recommended repositories](#).

To support data sharing and author compliance of the PLOS data policy, we have integrated our submission process with a select set of data repositories. The list is neither representative nor exhaustive of the suitable repositories available to authors. Current repository integration

partners include [Dryad](#) and [FlowRepository](#). Please contact data@plos.org to make recommendations for further partnerships.

Instructions for PLOS submissions with data deposited in an integration partner repository:

- Deposit data in the integrated repository of choice.
- Once deposition is final and complete, the repository will provide you with a dataset DOI (provisional) and private URL for reviewers to gain access to the data.
- Enter the given data DOI into the full Data Availability Statement, which is requested in the Additional Information section of the PLOS submission form. Then provide the URL passcode in the Attach Files section.

If you have any questions, please [email us](#).

Striking image

You can choose to upload a “Striking Image” that we may use to represent your article online in places like the journal homepage or in search results.

The striking image must be derived from a figure or supporting information file from the submission, i.e., a cropped portion of an image or the entire image. Striking images should ideally be high resolution, eye-catching, single panel images, and should ideally avoid containing added details such as text, scale bars, and arrows.

If no striking image is uploaded, we will designate a figure from the submission as the striking image.

Striking images should not contain potentially identifying images of people. [Read our policy on identifying information.](#)

[The PLOS licenses and copyright policy](#) also applies to striking images.

Additional Information Requested at Submission

Financial Disclosure Statement

This information should describe sources of funding that have supported the work. It is important to gather these details prior to submission because your financial disclosure statement cannot be changed after initial submission without journal approval. If your manuscript is published, your statement will appear in the Funding section of the article.

Enter this statement in the Financial Disclosure section of the submission form. Do not include it in your manuscript file.

The statement should include:

- Specific grant numbers
- Initials of authors who received each award
- Full names of commercial companies that funded the study or authors
- Initials of authors who received salary or other funding from commercial companies
- URLs to sponsors' websites

Also state whether any sponsors or funders (other than the named authors) played any role in:

- Study design
- Data collection and analysis
- Decision to publish
- Preparation of the manuscript

If they had no role in the research, include this sentence: "The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript."

If the study was unfunded, include this sentence as the Financial Disclosure statement: "The author(s) received no specific funding for this work."

[Read our policy on disclosure of funding sources.](#)

Competing interests

The corresponding author is asked at submission to declare, on behalf of all authors, whether there are any financial, personal, or professional interests that could be construed to have influenced the work.

Any relevant competing interests of authors must be available to editors and reviewers during the review process and will be stated in published articles.

[Read our policy on competing interests.](#)

Manuscripts disputing published work

For manuscripts disputing previously published work, it is *PLOS Global Public Health* policy to invite a signed review by the disputed author during the peer review process. This procedure is aimed at ensuring a thorough, transparent, and productive review process.

If the disputed author chooses to submit a review, it must be returned in a timely fashion and contain a full declaration of all competing interests. The Academic Editor will consider any such reviews in light of the competing interest.

Authors submitting manuscripts disputing previous work should explain the relationship between the manuscripts in their cover letter, and will be required to confirm that they accept the conditions of this review policy before the manuscript is considered further.

Related manuscripts

Upon submission, authors must confirm that the manuscript, or any related manuscript, is not currently under consideration or accepted elsewhere. If related work has been submitted to *PLOS Global Public Health* or elsewhere, authors must include a copy with the submitted article. Reviewers will be asked to comment on the overlap between related submissions.

We strongly discourage the unnecessary division of related work into separate manuscripts, and we will not consider manuscripts that are divided into “parts.” Each submission to *PLOS Global Public Health* must be written as an independent unit and should not rely on any work that has not already been accepted for publication. If related manuscripts are submitted to *PLOS Global Public Health*, the authors may be advised to combine them into a single manuscript at the editor's discretion.

Read our policies on [related manuscripts](#).

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PLOS encourages authors to post preprints to accelerate the dissemination of research. Posting a manuscript on a preprint server does not impact consideration of the manuscript at any PLOS journal.

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We ask authors to suggest suitable editors and at least four potential reviewers when submitting their manuscript. Bear in mind any potential competing interests when making these suggestions. It is not appropriate to suggest recent collaborators or other researchers at your institution. See our [policy on competing interests](#) for more information.

Opposed reviewers

Authors may choose to request that an individual is excluded from the review process and not involved in their manuscript. When making these suggestions, please provide specific reasons why each person should not review your submission in each “Reason” box. The editorial team will respect these requests so long as this does not interfere with the objective and thorough assessment of the submission.

Guidelines for Specific Study Types

Study design, reporting, and analyses are assessed against all relevant research and methodological technique standards held by the community. Guidelines for specific study types are outlined below.

Human subjects research

All research involving human participants must have been approved by the authors’ Institutional Review Board (IRB) or by equivalent ethics committee(s), and must have been conducted according to the principles expressed in the [Declaration of Helsinki](#). Authors should be able to submit, upon request, a statement from the IRB or ethics committee indicating approval of the research. We reserve the right to reject work that we believe has not been conducted to a high ethical standard, even when formal approval has been obtained.

Subjects must have been properly instructed and have indicated that they consent to participate by signing the appropriate informed consent paperwork. Authors may be asked to submit a blank, sample copy of a subject consent form. If consent was verbal instead of written, or if consent could not be obtained, the authors must explain the reason in the manuscript, and the use of verbal consent or the lack of consent must have been approved by the IRB or ethics committee.

All efforts should be made to protect patient privacy and anonymity. Identifying information, including photos, should not be included in the manuscript unless the information is crucial and the individual has provided written consent by completing the [Consent Form for Publication in a PLOS Journal \(PDF\)](#). Download additional translations of the form [here](#). More information about patient privacy, anonymity, and informed consent can be found in



the [International Committee of Medical Journal Editors \(ICMJE\) Privacy and Confidentiality guidelines](#).

Appendix 15: Author Guidelines for Taylor & Francis Children's Health Care Journal

Instructions for authors

Thank you for choosing to submit your paper to us. These instructions will ensure we have everything required so your paper can move through peer review, production and publication smoothly. Please take the time to read and follow them as closely as possible, as doing so will ensure your paper matches the journal's requirements.

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For general guidance on every stage of the publication process, please visit our [Author Services website](#).

EDITINGSERVICES

Supporting Taylor & Francis authors

For editing support, including translation and language polishing, explore our [Editing Services website](#)

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- [My Authored Works](#)

About the Journal

Children's Health Care is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's [Aims & Scope](#) for information about its focus and peer-review policy.

Please note that this journal only publishes manuscripts in English.

Children's Health Care accepts the following types of article: original articles.

Open Access

You have the option to publish open access in this journal via our Open Select publishing program. Publishing open access means that your article will be free to access online immediately on publication, increasing the visibility, readership and impact of your research. Articles published Open Select with Taylor & Francis typically receive 95% more citations* and over 7 times as many downloads** compared to those that are not published Open Select.

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*Citations received up to 9th June 2021 for articles published in 2016-2020 in journals listed in Web of Science®. Data obtained on 9th June 2021, from Digital Science's Dimensions platform, available at <https://app.dimensions.ai>

**Usage in 2018-2020 for articles published in 2016-2020.

Peer Review and Ethics

Taylor & Francis is committed to peer-review integrity and upholding the highest standards of review. Once your paper has been assessed for suitability by the editor, it will then be single anonymous peer reviewed by two independent, anonymous expert referees, each delivering at least one report. If you have shared an earlier version of your Author's Original Manuscript on a preprint server, please be aware that anonymity cannot be guaranteed. Further information on our preprints policy and citation requirements can be found on our [Preprints Author Services page](#). Find out more about [what to expect during peer review](#) and read our guidance on [publishing ethics](#).

Preparing Your Paper

Structure

Your paper should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

Word Limits

Please include a word count for your paper. There are no word limits for papers in this journal.

Style Guidelines

Please refer to these [quick style guidelines](#) when preparing your paper, rather than any published articles or a sample copy.

Please use American spelling style consistently throughout your manuscript.

Please use double quotation marks, except where "a quotation is 'within' a quotation".

Please note that long quotations should be indented without quotation marks.

Reporting Race and Ethnicity

Please reference the following article when reporting Race and Ethnicity in articles submitted to Children's Health Care.

Tonya M Palermo, PhD, Melissa A Alderfer, PhD, Katelynn E Boerner, PhD, Marisa E Hilliard, PhD, Anna M Hood, PhD, Avani C Modi, PhD, Yelena P Wu, PhD, Editorial: Diversity, Equity, and Inclusion: Reporting Race and Ethnicity in the Journal of Pediatric Psychology, Journal of Pediatric Psychology, Volume 46, Issue 7, August 2021, Pages 731–733, <https://doi.org/10.1093/jpepsy/jsab063>

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Papers may be submitted in Word or LaTeX formats. Please do not submit your paper as a PDF. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting template(s).

[Word templates](#) are available for this journal. Please save the template to your hard drive, ready for use.

If you are not able to use the template via the links (or if you have any other template queries) please contact us [here](#).

Each manuscript should end with an 'Implications for Practice' section. This section can be as long as the author believes appropriate (at least one full paragraph) and describe implications of this research for applied practice.

References

Please use this [T&F legacy APA 6](#) reference style when preparing your paper.

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Checklist: What to Include

1. **Author details.** Please ensure all listed authors meet the [Taylor & Francis authorship criteria](#). All authors of a manuscript should include their full name and affiliation on the cover page of the manuscript. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves

affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. [Read more on authorship.](#)

2. Should contain an unstructured abstract of 100 words. Read tips on [writing your abstract.](#)
3. You can opt to include a **video abstract** with your article. [Find out how these can help your work reach a wider audience, and what to think about when filming.](#)
4. Do not include **keywords**. Read [making your article more discoverable](#), including information on choosing a title and search engine optimization.
5. **Funding details.** Please supply all details required by your funding and grant-awarding bodies as follows:
For single agency grants
This work was supported by the [Funding Agency] under Grant [number xxxx].
For multiple agency grants
This work was supported by the [Funding Agency #1] under Grant [number xxxx]; [Funding Agency #2] under Grant [number xxxx]; and [Funding Agency #3] under Grant [number xxxx].
6. **Disclosure statement.** This is to acknowledge any financial or non-financial interest that has arisen from the direct applications of your research. If there are no relevant competing interests to declare please state this within the article, for example: *The authors report there are no competing interests to declare.* [Further guidance on what is a conflict of interest and how to disclose it.](#)
7. **Data availability statement.** If there is a data set associated with the paper, please provide information about where the data supporting the results or analyses presented in the paper can be found. Where applicable, this should include the hyperlink, DOI or other persistent identifier associated with the data set(s). [Templates](#) are also available to support authors.
8. **Data deposition.** If you choose to share or make the data underlying the study open, please deposit your data in a [recognized data repository](#) prior to or at the time of submission. You will be asked to provide the DOI, pre-reserved DOI, or other persistent identifier for the data set.
9. **Supplemental online material.** Supplemental material can be a video, dataset, fileset, sound file or anything which supports (and is pertinent to) your paper. We

publish supplemental material online via Figshare. Find out more about [supplemental material and how to submit it with your article](#).

10. **Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for color, at the correct size). Figures should be supplied in one of our preferred file formats: EPS, PS, JPEG, TIFF, or Microsoft Word (DOC or DOCX) files are acceptable for figures that have been drawn in Word. For information relating to other file types, please consult our [Submission of electronic artwork](#) document.
11. **Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.
12. **Equations.** If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about [mathematical symbols and equations](#).
13. **Units.** Please use [SI units](#) (non-italicized).

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Please note that *Children's Health Care* uses [Crossref™](#) to screen papers for unoriginal material. By submitting your paper to *Children's Health Care* you are agreeing to originality checks during the peer-review and production processes.

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This journal applies the Taylor & Francis [Basic Data Sharing Policy](#). Authors are encouraged to share or make open the data supporting the results or analyses presented in their paper where this does not violate the protection of human subjects or other valid privacy or security concerns.

Authors are encouraged to deposit the dataset(s) in a recognized data repository that can mint a persistent digital identifier, preferably a digital object identifier (DOI) and recognizes a long-term preservation plan. If you are uncertain about where to deposit your data, please see [this information regarding repositories](#).

Authors are further encouraged to [cite any data sets referenced](#) in the article and provide a [Data Availability Statement](#).

At the point of submission, you will be asked if there is a data set associated with the paper. If you reply yes, you will be asked to provide the DOI, pre-registered DOI, hyperlink, or other persistent identifier associated with the data set(s). If you have selected to provide a pre-registered DOI, please be prepared to share the reviewer URL associated with your data deposit, upon request by reviewers.

Where one or multiple data sets are associated with a manuscript, these are not formally peer-reviewed as a part of the journal submission process. It is the author's responsibility to ensure the soundness of data. Any errors in the data rest solely with the producers of the data set(s).

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We are committed to promoting and increasing the visibility of your article. Here are some tips and ideas on how you can work with us to [promote your research](#).

Appendix 16: Author Guidelines for MDPIs Healthcare Journal

Manuscript Submission Overview

Types of Publications

Full experimental details must be provided so that the results can be reproduced. *Healthcare* requires that authors publish all experimental controls and make full datasets available where possible (see the guidelines on **Supplementary Materials** and references to unpublished data).

Manuscripts submitted to *Healthcare* should neither be published previously nor be under consideration for publication in another journal. The main article types are listed below and a comprehensive list of article types can be found [here](#).

- *Article*: These are original research manuscripts. The work should report scientifically sound experiments and provide a substantial amount of new information. The article should include the most recent and relevant references in the field. The structure should include an Abstract, Keywords, Introduction, Materials and Methods, Results, Discussion, and Conclusions (optional) sections, with a suggested minimum word count of 4000 words. Please refer to the journal webpages for specific instructions and templates.
- *Review*: Reviews offer a comprehensive analysis of the existing literature within a field of study, identifying current gaps or problems. They should be critical and constructive and provide recommendations for future research. No new, unpublished data should be presented. The structure can include an Abstract, Keywords, Introduction, Relevant Sections, Discussion, Conclusions, and Future Directions, with a suggested minimum word count of 4000 words.

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Manuscripts for *Healthcare* should be submitted online at susy.mdpi.com. The submitting author, who is generally the corresponding author, is responsible for the manuscript during the submission and peer-review process. The submitting author must ensure that all eligible co-authors have been included in the author list (read the **criteria to qualify for authorship**) and that they have all read and approved the submitted version of the manuscript. To submit your manuscript, register and log in to the **submission website**. Once you have registered, [click here to go to the submission form for Healthcare](#). All co-authors can see

the manuscript details in the submission system, if they register and log in using the e-mail address provided during manuscript submission.

Accepted File Formats

Authors are encouraged to use the **Microsoft Word template** or **LaTeX template** to prepare their manuscript. Using the template file will substantially shorten the time to complete copy-editing and publication of accepted manuscripts. The total amount of data for all files must not exceed 120 MB. If this is a problem, please contact the Editorial Office healthcare@mdpi.com. Accepted file formats are:

- *Microsoft Word*: Manuscripts prepared in Microsoft Word must be converted into a single file before submission. When preparing manuscripts in Microsoft Word, we encourage you to use the **Healthcare Microsoft Word template file**. Please insert your graphics (schemes, figures, etc.) in the main text after the paragraph of its first citation.
- *LaTeX*: Manuscripts prepared in LaTeX must be collated into one ZIP folder (including all source files and images, so that the Editorial Office can recompile the submitted PDF). When preparing manuscripts in LaTeX, we encourage you to use the **Healthcare LaTeX template files**. You can now also use the online application **writeLaTeX** to submit articles directly to *Healthcare*. The MDPI LaTeX template file should be selected from the **writeLaTeX template gallery**.
- *Supplementary files*: May be any format, but it is recommended that you use common, non-proprietary formats where possible (see **below** for further details).

Disclaimer: Usage of these templates is exclusively intended for submission to the journal for peer-review, and strictly limited to this purpose and it cannot be used for posting online on preprint servers or other websites.

Free Format Submission

Healthcare now accepts free format submission:

- We do not have strict formatting requirements, but all manuscripts must contain the required sections: Author Information, Abstract, Keywords, Introduction, Materials & Methods, Results, Conclusions, Figures and Tables with Captions, Funding Information, Author Contributions, Conflict of Interest and other Ethics Statements. Check the Journal **Instructions for Authors** for more details.

- Your references may be in any style, provided that you use the consistent formatting throughout. It is essential to include author(s) name(s), journal or book title, article or chapter title (where required), year of publication, volume and issue (where appropriate) and pagination. DOI numbers (Digital Object Identifier) are not mandatory but highly encouraged. The bibliography software package *EndNote*, **Zotero**, *Mendeley*, *Reference Manager* are recommended.
- When your manuscript reaches the revision stage, you will be requested to format the manuscript according to the journal guidelines.

Cover Letter

A cover letter must be included with each manuscript submission. It should be concise and explain why the content of the paper is significant, placing the findings in the context of existing work. It should explain why the manuscript fits the scope of the journal.

Any prior submissions of the manuscript to MDPI journals must be acknowledged. If this is the case, it is strongly recommended that the previous manuscript ID is provided in the submission system, which will ease your current submission process. The names of proposed and excluded reviewers should be provided in the submission system, not in the cover letter.

All cover letters are required to include the statements:

- We confirm that neither the manuscript nor any parts of its content are currently under consideration or published in another journal.
- All authors have approved the manuscript and agree with its submission to (journal name).

Author Biography

Authors are encouraged to add a biography (maximum 150 words) to the submission and post it to **SciProfiles**. This should be a single paragraph and should contain the following points:

1. Authors' full names followed by current positions;
2. Education background including institution information and year of graduation (type and level of degree received);
3. Work experience;
4. Current and previous research interests;
5. Memberships of professional societies and awards received.

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This journal automatically deposits papers to PubMed Central after publication of an issue. Authors do not need to separately submit their papers through the NIH Manuscript Submission System (NIHMS, <http://nihms.nih.gov/>).

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Manuscript Preparation

General Considerations

- **Research manuscripts** should comprise:
 - **Front matter:** Title, Author list, Affiliations, Abstract, Keywords.
 - **Research manuscript sections:** Introduction, Materials and Methods, Results, Discussion, Conclusions (optional).
 - **Back matter:** Supplementary Materials, Acknowledgments, Author Contributions, Conflicts of Interest, **References**.
- **Review manuscripts** should comprise the **front matter**, literature review sections and the **back matter**. The template file can also be used to prepare the front and back matter of your review manuscript. It is not necessary to follow the remaining structure. Structured reviews and meta-analyses should use the same structure as research articles and ensure they conform to the **PRISMA** guidelines.
- **Case reports** should include a succinct introduction about the general medical condition or relevant symptoms that will be discussed in the case report; the case presentation including all of the relevant de-identified demographic and descriptive information about the patient(s), and a description of the symptoms, diagnosis, treatment, and outcome; a discussion providing context and any necessary explanation of specific treatment decisions; a conclusion briefly outlining the take-home message and the lessons learned.
- **Graphical Abstract:**

A graphical abstract (GA) is an image that appears alongside the text abstract in the Table of Contents. In addition to summarizing the content, it should represent the topic of the article in an attention-grabbing way. Moreover, it should not be exactly the same as the Figure in the paper or just a simple superposition of several subfigures. Note that the GA must be original

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The GA should be a high-quality illustration or diagram in any of the following formats: PNG, JPEG, TIFF, or SVG. Written text in a GA should be clear and easy to read, using one of the following fonts: Times, Arial, Courier, Helvetica, Ubuntu or Calibri.

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Research Ethics

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To The Department of Public Health

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27 February 2023

To whom it may concern

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I hereby acknowledge that I edited PhD Thesis by SHAMISO ALICE MOYO titled "**A GROWTH MONITORING AND PROMOTION INDEX TO IMPROVE CHILD HEALTH IN UMGUZA DISTRICT IN ZIMBABWE**". I confirm that I did Language and structural editing on the above-mentioned thesis. Do not hesitate to contact the undersigned for further information on the subject matter.

Yours Sincerely



PROF WILFRED NJABULO NUNU (PHD PUBLIC HEALTH)

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