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**Altruism: A solution to antibiotics treatment for indigent paediatric in-patient.**

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**Abstract**

**Background:**The willingness to donate antibiotics for the treatment of indigent children among caregivers of paediatric in-patients has not been evaluated.

**Methods:**The focus group discussion was used for data collection. The caregivers' willingness to donate was based on (a) ability to give out their purchased drugs while their children are on treatment, (b) relinquish any remaining drugs at the completion of their children treatment and (c) willingness to accept donated antibiotics.

**Findings:** All the respondents, 27 participants were willing to donate for the care of indigent children. Twelve (44.4%) were willing to donate from their purchased antibiotics, if an indigent patient on admission needs it, 4 (14.8%) were willing to donate for future care of indigent patients, 10 (37%) and 20 (74.1%) were willing to relinquish any remaining untampered and any remaining reconstituted antibiotics respectively. Thirteen participants (48.1%) accepted to allow starting treatment of their children with remnant already reconstituted antibiotics.

**Conclusion:** Altruistic willingness-to-donate antibiotics can exist in pediatric in-patient. This avenue should be explored to ensure availability of antibiotic for the treatment of indigent children, especially in places where social health insurance is not a common practice.

**Keywords:** Altruism, Antibiotics, Willingness-to-donate

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## Introduction

Effective altruism is an ideology that applies evidence and reason to determine the most effective ways to benefit others.[1] It encourages individuals to consider all causes and actions and to act in a way that brings about the greatest positive impact based upon their values. The concept of effective altruism has been widely studied and used in different areas health interventions [2,3] such as community distribution of mosquito nets and health care services. Successful introduction and implementation of altruism in paediatric in-patient care in resource-poor countries have the potential of decreasing the gap between antibiotic prescription and commencement of antibiotic treatment for indigent paediatric patients especially with the existing high level of poverty and low coverage of social health insurance.[4,5]

Millions of children receive antibiotic treatment annually in Nigeria and higher prevalence among in-patient care.[6-11] Timely commencement of these antibiotic therapies is paramount but often not the reality, especially among indigent caregivers who are expected to pay out of pocket. This often limits the healthcare providers' antibiotic's treatment options.[12,13] These challenges affect the adequate implementation of antibiotic stewardship (ABS).[14-17]

The concept of ABS is commencing appropriate antibiotics where indicated in the appropriate dose, route, and duration and discontinuing the antibiotic treatment once considered no longer necessary. Interventions to improve ABS has always focused on changing healthcare provider prescribing behavior, researchers have failed to consider the problem of providing the prescribed antibiotics especially in places where OOP is highly due to lack of implementation of formal sector social health insurance programme (FSSHIP) and poverty level is high.[4,5]

One area that has not been considered as a solution to these is the area of humanitarian and charity. Studies have shown that majority of individuals who identify their capabilities to help always utilizes the opportunity and become of great help, and this is the principle

of altruism and has been widely explored in the health sector. One question that deserves an answer is, "can well-to-do caregivers of paediatric patients on admission providing antibiotics altruistically for the care of indigent paediatric patients? To providers answer to this question was the aim of this study. The outcome will inform policy reform towards designing intervention that can improve antibiotic availability, especially for indigent children.

## Materials and Methods

### Study Area

The study took place in three southeastern states in Nigeria: Abia, Ebonyi, and Enugu. Three tertiary health facilities which render paediatric health care services in these states were randomly selected. These hospitals have wide catchment areas and are accessed by households of different socio-economic status. They are all public facilities, and user fees are paid at the point where care was received.

### Study design and population

The study was cross-sectional, and the period study was from March 2017 to May 2017. Simple random selection was used in the selection of the respondents. Healthcare workers and the parents/caregivers of in-patient children in the hospitals were interviewed.

### Sampling and data collection

A total of three (3) Focus Group Discussions (FGDs) with the children's caregivers and 16 In-depth interviews (IDIs) with healthcare workers (HCWs) were used to collect data. A sociologist developed the interviewer's guides that were used for IDIs and FGDs. The guide was further translated to the native language (Igbo) for better comprehension. The guides were designed to obtain information on HCWs' antibiotics usage, ability to promptly provide antibiotics, willingness-to-donate antibiotics for other children use, and their willingness to allow their children to receive antibiotic reconstituted for other children. An inventory of remnants drugs of discharged patients in the hospital refrigerator was conducted. This is to evaluate the drug wastage due to discontinuation of antibiotic or discharge.

The IDIs were for doctors, nurses, and pharmacists. Three to four doctors, one nurse, and one pharmacist were identified and selected through random sampling for the IDI from each hospital. Information sheets were provided for them prior to the commencement of the interviews. Sixteen (16) IDIs were conducted in total.

The FGDs: A list of all the mothers/caregivers of children who had been on admission for a minimum of three days in the paediatric wards were used to develop a frame of random numbers; a minimum of eight subjects were randomly selected for each FGD. One FGD was conducted in each of the selected facilities, making it a total of three FGDs. The FGDs involved 8 – 10 caregivers per session to allow for an opportunity to get opinions from many mothers. A participant's biodata form was filled and signed by the participants before commencing each of the FGDs.

The participants in the FGD were mainly females (24) and a few males (3). Their occupations were diverse: banker, businessmen/women, civil servants, housewives, and petty traders. Sex balance could not be achieved because most caregivers were mothers. Each FGD lasted between 55 and 70 minutes. Light refreshment was provided for the respondents after the discussions. With the consent of the interviewees and FGD participants, the interviews were recorded.

Pilot and pre-testing of the FGD and IDI guides. The guide was pilot-tested among health care workers and parents that brought their children to a health center. This helped improve the comprehension and clarity of the lead questions and informed some modifications that were made before the survey. The information given was as follows: for the FGDs, the respondents were asked their experiences with antibiotic change in the first 48 hours, which was considered to be a challenge. They were asked where they purchased the antibiotics used for their children. After which they were asked whether they could donate antibiotic for indigent children as well as whether they can willingly relinquish any remaining reconstituted antibiotics for other children to use. They were also asked that even when they can provide

their children drugs, whether they are willing to allow their children to receive treatment from already reconstituted antibiotics used for a discharged patient.

#### Data Management and Analysis

Quantitative analysis: The medical records of children on admission were reviewed. A proforma was used to document the quantity and estimate the cost of the remnant antibiotics in the refrigerator.

The costs of the different antibiotics were obtained through market survey. The average of the different prices was obtained. The estimated cost of the remnant antibiotics was calculated using the formula:

Average price =  $x$ ; the proportion of the remnant antibiotic =  $a/b$ , where "a" is the quantity/dosage remaining and "b" is the total amount of dose in "mg" in one vial  $x.a/b$

The cost estimates were in the local Nigerian currency (Naira) and converted to U.S. dollars (USD) at the official rate of 350 naira according to Central Bank of Nigeria (CBN) 2017. The discrepancies in the cost structure and purchasing power of the Naira and USD were adjusted using purchasing power parity.

The education and occupation of the parent were used to estimate the socioeconomic class and grouped into three groups: 1 – 2 high class, 3 middle and 4 – 5 low class.

Qualitative data: The audio recordings were transcribed verbatim into Microsoft Word documents (Microsoft, Redmond, WA) for analysis. To ensure transcription quality, all transcriptions were independently checked against the original audio recordings. A deductive approach was used to develop thematic headings. Parent and child nodes were developed to aid coding into the Nvivo software (QSR International, Melbourne, Australia) for the analysis.

#### Ethical Considerations

The approval to carry out this study was obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Enugu (Nigeria) Informed written consents were obtained from participants.

## Results

### Antibiotics Prescription Pattern

The proportion of the in-patients on parental

antibiotics were 45 (84.2%), and in all cases, 7 (15.5%) were able to commence the prescribed antimicrobials within 1 hour the prescription was made. (Table 1). The mean value of the remnant antibiotics was USD 2.1.

**Table 1: Antibiotic prescription, provision and remnant (Treatment sheet)**

Variables	n(%)
<b>Were antibiotics prescribed? (n=53)</b>	
Yes	45 (84.2%)
No	8 (15.8%)
<b>Was the prescribed antibiotic started within 1 hour of prescription? (n=45)</b>	
Yes	7 (15.5%)
No	38 (84.5%)
<b>Cost value of the Remnant antibiotics (USD) Mean (Range)</b>	<b>\$2.1 USD (\$1.4 - 2.6 USD)</b>

### Focus Group Discussion Results

#### Willingness to donate antibiotics (Caregivers)

The respondents' reactions to the idea of donating antibiotic to be used for other indigent children. In their response to the question, "Are you willing to donate antibiotic to be used by other children whose parents could not afford their prescribed antibiotics?" All (n = 27, 100%) were willing to donate for indigent children. However, they vary on what they can afford to donate. Some of the responses were as follows:

*"Anytime, they ask for it, I usually provide."*

*"A lot of people are poor"*

*"If it the same drug that we are being administered to, if I have it, I will give."*

*"If there is anybody who needs it, and they plead with me, I can give them."*

*"As long as I know somebody have need of them... is it not to save someone's life? Whether you give me money or not..."*

When asked whether they can procure an extra of their prescribed antibiotics for indigent children. Only 4 (14.8%) accepted to procure antibiotics for future use of another patient, but majority 23 (85.2%) were willing to contribute something towards the provision of antibiotics for indigent children. In their responses:

*"I can give one thousand naira (\$4USD).*

*"I will give if I have money."*

*"So let's have it while coming to the hospital that why you are a caregiver to your own ward, you are still a caregiver to some other persons."*

They were asked whether they are willing to relinquish the remnant antibiotics used in the treatment of their children. In their responses to the question, "Will you release the antibiotics remaining after your children treatment? 20 (74.1%) accepted to relinquish any ruminant antibiotic while only 10 (37%) were willing to give out remaining untampered purchased antibiotics.

*"I will be willing to give that one (remaining antibiotic) because it is not going to be useful to me again."*

*"A lot of people use to go home with it, and you find out that there is nothing much you can use it for in the house."*

*"I will give them free, as long as it has been opened and mixed."*

*"As long as my child has recovered, I will give them out to people that need them."*

*"I may not have enough, and I know that maybe if I sell it off or maybe if I exchange it somehow, I can get money with which I will continue my treatment or with which I can use to buy other drugs, I will go and change it and buy other drugs."*

*"I will ask the person to buy it even if it means removing some money."*

To establish their willingness to accept

reconstituted antibiotics used to treat other children, even when they can afford to buy their prescribed antibiotic. There was a varied response to the question,” Assuming that remaining antibiotic previous used in the treatment of another child is to be giving to your child, will you accept? Nevertheless, 18 (66.7%) were willing to allow their children with antibiotic treatment to be started with remnant antibiotics.

*“I will accept. The (my baby’s) injection was supposed to be given by 2 pm, but they are waiting for my husband to come”.*

*“It will be good that somebody is made to know what is on ground so that the person will be aware of everything that is going on.”*

*“I will tell you to go on as long as it is the same thing... I will agree that the child should be injected under that circumstance.”*

*“If it is ok and wise to use an injection that has been mixed.”*

*“I will allow it...”*

*“They might be afraid of fear of contamination, fear of infections, especially if the syringes are being used, the mixing and all those.”*

To evaluate the feasibility of implementing altruism (Caregivers and Healthcare workers)

The HCWs were asked the question, *“what are you think it is a good idea of asking caregivers to donate antibiotics for the care of indigent children?* In their response, all, 18 (100%) were of the opinion that there is nothing wrong in asking caregivers who can afford it to donate antibiotics but it should not be coerced to do that but will be voluntary. Some of the responses were:

*“I don’t think that 70% of the patient will say no”.*

*“They, on their own, tell the doctors that they have those drugs, we can use it for the other patients. So I think it’s a welcome idea.”*

*“Is leftover, they say, “please, use it for any other patient that may need it.”*

On the management of such donated antibiotics, they were asked to suggest how such drugs can be handled since they will be coming in an irregular pattern. The HCWs were also asked what they think about using remaining antibiotics for the treatment of other children. In their responses, they portrayed that

such thing has been going on already that is needed a making a policy to formalize such acts. Some of their responses are as follow:

*“The pooling in effect may have been operating quietly because the nurses themselves will know. It is just to modify those existing process and make it more functional.”*

*“Yes, they (indigent patients) may come and sometimes, we use it for the.”*

*“If it is possible, if those drugs can be submitted to us, we can manage it well for them. We can do that one.”*

*“I don’t know, indigent patient may not really in a position to reject any free treatment,... And to prevent it from overstaying, you may have to now see ourselves using it for those who can even afford it.”*

## Discussion

All the caregivers of the paediatric in-patients were willing to assist indigent patients to get their antibiotic treatment but in varied forms. There was no study to compare these findings with since this is the first of such study. Although the concept of altruism is not new and have been studied severally in another aspect of health care with positive outcome but not on the donation of antibiotics.[2-3] However the overriding acceptance to assist in the provision of the care for other children on admission is keeping with the ideology of altruism which is rendering care in multitudes ways without recourse to reward or personal benefit. It is motivated by concern for the well-being of others.[18] This was rightly captured in the response gave by one of the respondents, *“parents and caregivers as they bring their children to hospital should have it in mind to care for their children as well as assist other children who cannot afford their care to get well also”.* Such practice of rendering support to parents and caregivers of paediatric in-patients by both healthcare workers and other caregivers will decrease stress and aids them to adjust with hospitalization and also improve the quality of care.[19]

The proportion of the respondents who were willing to procure antibiotic for another patient was low. What majority was willing to give was the antibiotic remaining after their children have completed their treatment. Unfortunately,

majority of the antibiotics remaining after care are already reconstituted and often discarded. The only means of salvaging such is if parents who can afford their children antibiotics will be willing to accept commencing their children treatment with such remnant drugs.

Interestingly, there was a positive response when parents were asked whether they can accept already reconstituted antibiotics. Implementation of this will be very useful, but only after in-depth review and evaluation have shown such practice to be safe. According to WHO patients should never share or use leftover antibiotics. But this applies to individual on home medication and is on oral treatment. Whether the same applies to those on hospital admission and on parenteral antibiotics has not been established.

Ordinarily, remaining reconstituted antibiotics are often discarded upon discharge. Implementation of policy which sees these waste-bound antibiotics being converted to good use will be a very good developing under the concept of altruism. Knowledge that their seemingly remnant antibiotic, which often considered as waste, can benefit a child, will give them the perception of being compassionate, sympathetic, generous, and helpful. Thus there is a need to closely review the potential of reutilizing remaining antibiotics for the care of other children. An aspect of this reuse of antibiotic policy will involve using the drug to commence treatment in any child that requires such antibiotic irrespective of whether indigent or not. The idea remains that the shelf life of reconstituted antibiotic is not certain, especially where in places with epileptic power supply to guarantee adequate preservation. Furthermore, although the altruism is for indigent children, nobody knows when an indigent child will come for admission. Thus, if the children from well-to-do household are treated from this donated drugs and their freshly purchased antibiotic is cataloged and returned to the safe custody of the nurses or pharmacy for future use.

One limitation in this study is not evaluating their willingness to donate money with reference to either hedonic product or a utilitarian product; since these antibiotics are costly, and some may be willing to donate

something less expensive. Finding had it been that such was done would have informed the best approach to soliciting for charity donation.

### Conclusion

Altruism is a potential avenue for provision and sustenance of antibiotic therapy in paediatric in-patient care. In the caregivers' perspective, relinquishing their remaining antibiotics is a sure source of antibiotics for treatment of indigent children. This study also revealed that parents were willing to commence treatment of their children with already reconstituted antibiotics used by another child. Although this will be a potential source of sustenance of antibiotics, further studies are still required to establish the safety of sharing antibiotics among children on admission.

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