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Education on Beyond Use Date (BUD) for Ear and Nasal Drops: Efforts to Increase Patient Awareness in Pharmacies with ENT Doctor Services

Anis Akhwan Dhafin[1*], Elsa Mahardika Putri[2], Winartiana[3], Okki Intan Mawarni[4], Herman[5], Maharani Dwi Pritiwi[6]
[1,2,3,4,5,6] *Undergraduate pharmacy study program, Universitas Kadiri, Indonesia*
[*]***Corresponding author:*** *anisdhafin13@unik-kediri.ac.id*

ABSTRACT
The rational and safe use of medication is a critical concern in pharmaceutical practice. A key aspect often overlooked by patients is the Beyond Use Date (BUD), which indicates the time limit for using a medication after its primary packaging has been opened or the preparation compounded. This community service activity aimed to increase public awareness and understanding of BUD, especially regarding non-sterile ENT (ear, nose, and throat) medications. The program was conducted at Sriti Pharmacy in Kediri City on July 22, 2025, involving 26 outpatient participants. The educational method included personal counselling, interactive discussions, and leaflet distribution. Evaluation of the program's impact was performed qualitatively through direct observation and analysis of participant feedback during the sessions. Initial interactions revealed a universal lack of prior knowledge regarding BUD among participants, who frequently confused it with the Expiration Date (ED). Following the intervention, observations indicated a notable increase in participant awareness and engagement. Participants actively asked relevant questions, were able to verbally articulate the distinction between BUD and ED, and expressed a clear understanding of the risks and proper storage practices. These qualitative findings suggest that direct educational interventions in pharmacy settings are a valuable method for improving medication literacy. It is acknowledged that this activity has limitations, primarily the absence of quantitative measurement to formally assess the degree of knowledge improvement and a small sample size at a single location, which limits the generalizability of the findings.

Keywords **:** Beyond Use Date, Ear and Nasal Drops, Medication Safety, Patient Education, Pharmaceutical Service

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INTRODUCTION

Drug stability is a fundamental aspect of pharmaceutical science that is directly related to the quality, safety, and effectiveness of a drug during its shelf life. A pharmaceutical preparation is considered stable if it does not show significant changes in physical, chemical,

microbiological, toxicological, or therapeutic effects, both during storage and during patient use, including after the packaging is opened. In practice, people often store drugs for emergency purposes as a form of self-medication. However, limited knowledge about proper storage methods and the limit of drug use after the packaging is opened, known as the Beyond Use Date (BUD), can increase the risk of using drugs that are no longer optimal, even harmful to health. Therefore, education about BUD, storage, and proper use of drugs is crucial and is part of the strategic role of pharmaceutical personnel in increasing public awareness and rational behaviour in drug use (Windi FQ, *et al* ., 2023; Nurbaety *et al* ., 2022 ; BPOM RI, 2022) .

In the pharmaceutical world, the expiration date (ED) listed on a drug's packaging is no longer an absolute reference once the primary packaging is opened. This is because drug stability can change due to exposure to external environments such as air, light, and humidity. Therefore, the term Beyond Use Date (BUD) is used, which is the time limit for drug use after it has been formulated, prepared, or after the primary packaging has been opened or damaged (Nilansari *et al.* , 2022) . BUD tends to be shorter than ED, and this information is not always included on the label, so it needs to be communicated directly by pharmacists to patients (Kusuma et al., 2020 ; R. Prasetya & Dwiastuti, 2023) .

Public ignorance about BUD can result in the use of drugs that are no longer effective, even risking health. This is especially important for topical medications such as ear drops and nasal drops, which are included in non-sterile liquid preparations and are widely used in the treatment of ear, nose, and throat (ENT) disorders. Based on data from the 2018 Basic Health Research (Riskesdas), the prevalence of ear disorders in Indonesia reached 7.1%, with upper respiratory tract diseases such as rhinitis and pharyngitis as the main cause of visits to health facilities (Ministry of Health of the Republic of Indonesia, 2018) . This condition causes a high need for the use of medicines, especially topical preparations such as ear and nasal drops, which are commonly prescribed by ENT doctors. These drops are included in non-sterile preparations that have a limited shelf life after being opened or formulated, known as **Beyond Use Date (BUD)**.

The BUD is the expiration date for a drug determined based on its chemical stability and the risk of microbiological contamination after the packaging is opened or the drug is compounded (Trissel, 2021) . Unlike the expiration date set by the manufacturer for unopened products, the BUD is much shorter and more specific. According to USP <795>, the BUD for non-sterile liquid preparations such as ear and nasal drops at room temperature usually does not exceed 14 days, unless other stability data supports it. (USP, 2021) . Unfortunately, public understanding of this issue remains low. Putri *et al* . (2022) found that 54% of patients were unaware of the existence of oral contraceptive pills (BUDs), while 47% continued to use the drops more than two weeks after opening. Similar findings were reported by Fitriana & Siregar (2020) , who showed that only 35% of patients received education about BUDs from pharmacists in community pharmacies.

This lack of understanding increases the risk of using expired medications, such as decreased effectiveness, microbial contamination, and potential reinfection (Rosenfeld *et al* ., 2016) . Education about BUD is crucial for improving patient literacy in the safe use of medications. Therefore, this activity is carried out in pharmacies with independent ENT practices, given the high use of ear and nose drops. Direct patient education aims to increase understanding of BUD and strengthen the role of pharmacists in supporting safe medication use in the community (A. Prasetya & Utami, 2019) .

METHOD

This community service activity took place on July 22, 2025, at Sriti Pharmacy in Kediri City, a partner practice for ENT specialists. The activity involved a team of lecturers and students from the Pharmacy Study Program at Kadiri University, with the aim of providing education on the Beyond Use Date (BUD) for ear and nose drops to patients filling prescriptions.

The series of activities is carried out using the following methods:

1. **Coordination and Preparation**
   The initial step involved establishing communication and coordination with the pharmacy to establish a schedule and schedule for the activities. As a token of appreciation and to foster good relations, the community service team presented campus souvenirs to the partner pharmacy before the activity began.
2. **Participant Identification**
   Patients who purchased or redeemed ear/nasal drops were selected as education participants.
3. **Live Education (Interactive Lectures)**
   Education is provided briefly and personally by the team to each patient, explaining the difference between the expiration date (ED) and the BUD, as well as the risks of using the drug after the BUD period.
4. **Leaflet Distribution**
   Patients receive a leaflet containing important information about BUD and how to properly store the medication.
5. **Q&A and Short Evaluation**
   Patients are given the opportunity to ask questions and receive brief verbal confirmation of understanding to measure the effectiveness of the education.

All activities are carried out in an efficient and friendly service time, without disrupting the pharmacy's operational activities.

RESULTS

A health promotion campaign with the theme "Beyond Use Date (BUD)" was successfully implemented in the waiting room of Sriti Pharmacy in Kediri City on Tuesday, July 22, 2025. The primary target audience was outpatients and/or families visiting Sriti Pharmacy for consultations with ENT specialists. A total of 26 participants of varying ages participated in the counseling session, as shown in Table 1.

Table 1. Patient Demographic Characteristics

Age Characteristics	**Frequency (n)**	**Percentage (%)**
Productive Age (18-55)	15	58
Elderly (>55)	11	42
Total	**26**	**100**

Table 2. Comparison of Participants' Knowledge Level Before and After Education (and=26)

Knowledge Statement	**Before Education (Pre-Test)**	**After Education (Post-Test)**
Able to explain the definition of BUD	0	25 (96%)
Able to differentiate between BUD and ED	2	25 (96%)
Know the general recommendations for BUD eye drops	0	24 (95%)

The outreach program was divided into two sessions, a morning session and an afternoon session, tailored to patient visit times. Prior to the outreach, the presenter administered a brief questionnaire (pre-test) to assess participants' initial knowledge of BUD. Table 2 shows that the results results of this initial assessment indicated a very low level of understanding: 100% of participants (26 out of 26) stated they had never heard of or did not understand the term BUD. Furthermore, 92% of participants (24 out of 26) admitted they considered the Expiration Date (ED) the sole reference point for medication expiration, even after the package has been opened.

A total of 26 participants attended the outreach program, who actively participated in the presentation and question-and-answer session. The participants' ages were quite diverse, and they could be grouped into two main categories: 15 (58%) from the productive age group (18-55 years old) and 11 (42%) from the elderly (seniors over 55 years old). The educational material presented included the definition of BUD, the difference between BUD and Expiration Date (ED), the risks of using medication past the BUD, and the proper storage of ear and nose drops. This information is crucial, considering that the drops prescribed by ENT doctors are non-sterile preparations that have a limited shelf life after the packaging is opened.

Through an interactive approach and leaflets, it is hoped that the public will better understand the risks of using medications after the BUD period has expired. To measure this increase in understanding, a short questionnaire (post-test) was administered after the session. The results showed a significant increase in awareness: 96% of participants (25 out of 26) were able to correctly explain the difference between BUD and ED. Furthermore, 92% of participants (24 out of 26) were able to correctly state the general BUD recommendations for ear drops. These data reinforce the observation that participants welcomed this activity well and acknowledged that it was very useful for improving the safety and rationality of drug use at the individual and family information level.

DISCUSSION

An educational activity about Beyond Use Dates (BUD) was held on July 22, 2025, in the waiting room of Sriti Pharmacy in Kediri City. Twenty-six participants from various age groups attended the event. The outreach was divided into two sessions, one in the morning and one in the afternoon, to accommodate the ENT doctor's practice schedule at the pharmacy. This approach aligns with research demonstrating the importance of flexible scheduling to increase public participation in health education programs (Wati & Harahap, 2024).

Before the education began, a brief question-and-answer session was conducted to gauge participants' initial understanding. Results indicated that all participants were unfamiliar with the term BUD and only knew the expiration date (ED) printed on the medication packaging. This lack of understanding reflects findings from various studies highlighting low health literacy regarding the safe use of medications among the general public (Kusumawati et al., 2025).

The education was delivered verbally, using leaflets distributed to participants. The use of leaflets as an educational medium has proven effective in disseminating concise, easy-to-understand information, especially among non-productive age groups (Luthfiani et al., 2021). The material presented includes the definition of BUD, its differences from ED, and concrete examples of drugs containing BUD, such as prescription drugs and opened syrups (Fernanda & Kusumo, 2023).

Lack of public knowledge regarding BUD is a significant challenge to safe medication use practices. Many patients store leftover medication for later use without understanding that the stability, safety, and effectiveness of a medication can change after the packaging is opened

or the medication is compounded. This lack of awareness can lead to decreased therapeutic effectiveness, increased risk of side effects, and microbiological contamination, especially in non-sterile preparations such as ear and nose drops (Kusuma, R et al., 2020 ; Iskandar et al., 2022) . Studies by Savira (2020) and Pramestutie *et al.* (2021) show that improper drug storage accelerates the degradation of active ingredients and increases the risk of irrational drug use. Similarly, storage without secondary packaging or complete labelling makes it difficult for users to identify instructions for use or the expiration date of the medication (Afqary, 2018) .

In this activity, participants were given an understanding of the definition of BUD, the fundamental differences between BUD and ED, and how to determine BUD, especially for ENT preparations. According to USP <795>, BUD for non-sterile liquid preparations is generally limited to 14 days at room temperature, unless there is additional stability data supporting a longer duration (USP, 2021) . Trissel (2021) also emphasized the importance of determining BUD based on storage conditions and the risk of microbiological contamination. Information was provided through direct lectures using leaflets as supporting media. Educational media in the form of leaflets has been proven to improve public understanding and retention of the information conveyed (Setiawan et al., 2023 ; Alfiya et al., 2022) .

Following the socialization, a simple evaluation using a question-and-answer method was conducted. The results showed that participants experienced a significant increase in knowledge. Participants who were initially unfamiliar with the term BUD became aware of the importance of differentiating between BUD and ED, as well as the dangers of using drugs beyond the BUD limit. These findings align with research by Kusuma et al. (2020) , which recorded a 14.06% increase in knowledge after the education program. Similarly, Iskandar et al. (2022) reported that similar community service activities effectively increased public understanding of controlling drug use based on BUD.

This outreach also demonstrated that education provided directly by pharmaceutical personnel in healthcare facilities can be an effective strategy for improving drug literacy in the community. The educational role of pharmacists and pharmacy students is key to promoting rational and safe drug use at the community level. Such activities are highly relevant for replication in various pharmacies or outpatient clinics, particularly in the context of the use of preparations susceptible to degradation such as eye drops, ear drops, and compounded preparations. Community-based educational strategies not only improve the quality of pharmaceutical services but also contribute to reducing the risk of *medication errors* systematically (Munawaroh & Nugroho, 2021) .

Figure 1. BUD education for patients

CONCLUSION

Beyond Use Date (BUD) education program was held on July 22, 2025, in the waiting room of Sriti Pharmacy in Kediri City, with 26 participants from various age groups. The outreach was divided into two sessions (morning and afternoon), adjusted to the ENT doctor's practice schedule.

Before the education began, a brief question and answer session was conducted to assess participants' initial understanding. The results indicated that all participants were unfamiliar with the term "BUD" and were only familiar with *the expiration date* (ED) on medication packaging. The education was conducted verbally, using leaflets distributed to participants.

After the counselling, most participants were able to explain the difference between BUD and ED and understood the importance of paying attention to expiration dates for medications after opening. Participants' responses indicated increased understanding, consistent with previous research showing that direct education effectively improves public health literacy (Kusuma et al., 2020; Iskandar et al., 2022).

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