Knowledge, Attitude, and Practice of Health Care Workers in the Management of Peptic Ulcer at the Paul VI and the Bogodogo District Hospitals, in Burkina Faso

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ABSTRACT

Background: In 2015, peptic ulcer disease (PUD) was cause of 52.3% and 17% of digestive bleeding and death in respectively among in-hospital patients at the gastro-enterology units of the main hospital in Ouagadougou. We aimed to assess the knowledge, attitudes and practices of the health care workers in the management of PUD.

Subjects dan Method: It was a descriptive cross-sectional study with a prospective data collection implemented at the Paul VI and the Bogodogo District Hospitals in Ouagadougou (Burkina Faso) from December 15, 2015 to January 25, 2016. A questionnaire was administered to 134 health care workers including medical doctors, nurses and midwives.

Results: The mean age was 33 years (Mean= 33.6; SD= 5.84). Females represented 61.9%. Knowledge levels were good to excellent for general knowledge, symptoms and treatment of PUD. Depending on the agent's qualification, knowledge levels were excellent in all areas for two-thirds to three-quarters of the general practitioners, except for knowledge of additional investigation analyses, where only 47.8% had an excellent knowledge. Depending on the level of education, the level of knowledge was at least good for more than 50% of the agents except for the knowledge of additional investigation analyses where only 45.2 % of the agents of secondary school level had a good knowledge. The main attitudes consisted in managing the patients in emergency and out of an emergency context in 45.8% and 42.2% of the cases, respectively. Regarding the practices, 51.5% of the HCWs systematically requested investigation analyses before starting an aetiological therapy.

Conclusion: The PUD knowledge ranks from good to excellent. However, the frequent prescription of symptomatic treatments could be the cause of many complications. The promotion of continuous medical education is a good mitigation plan to resolve the issues of knowledge and competence regarding the PUD.

Keywords: attitude, knowledge, peptic ulcer disease, practice

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BACKGROUND

Peptic ulcer disease (PUD) is defined as a loss of substance from the stomach or duodenal wall reaching deep into the muscles. It is different from erosions which are lesions limited to the mucosa and ulcera-

tions which reach the submucosa without going beyond it. PUD aetiologies are diverse. Its complications are multiple and influenced by multiple factors. PUD affects almost 10% of the world population, with an overall incidence of 3 new cases per 100 000 inhabitants. Helicobacter pylori (H. pylori) is found in the gastric mucosae 9 times out of 10. The NSAID-induced PUD occurs in 5% of the cases in the short-term therapies and 30% in the event of prolonged treatment (Fandi, 2000, Togola et al., 2015).

In Sub Saharan Africa, PUD is an important issue and impacts diversely the populations (Archampong et al., 2019). Studies carried out in Mali, the Republic of Côte d'Ivoire, Burundi and Congo Brazzaville found prevalences of 10.10%, 6.80%, 44.90%, and 30.40%, respectively (Togola et al., 2015, DIARRA et al., 2009, NDABA-NEZE et al., 1990, IBARA et al., 1993). In 2010 in Burkina Faso, the inpatients' proportion of PUD was 10.32 %, with the gastric localization 2.6 times more frequent than the duodenal one. In addition, PUD was a major contributor to complications with rates of 0.90%, 17%, and 57% for gastric cancer, gastrointestinal bleeding and ulcerative perforation, respectively. The overall case fatality rate of these complications was 8.50% (ILBOUDO et al., 1997).

A retrospective study from 1992 to 1998 in the general and digestive surgery department of the Yalgado Ouedraogo university teaching hospital found that 3% of all peritonitis were caused by PUD perforation. Among the patients with a gastric perforation, 25% had a history of epigastralgia (TRAORE et al., 1999). In 2015, in the same hospital, another study found that PUD was the cause for 52.30% of all digestive haemorrhage, of which 17% of deaths were noted (Sombié et al., 2015).

In Burkina Faso as in many African countries, the health care workers' (HCW) knowledge, their attitudes and practices regarding PUD have not been studied. In places where these have been assessed, the knowledge was average (Quartey et al., 2020, Fandi, 2000). The challenge is more important given that in many developing countries the doorkeepers of the health systems are nurses. The aim of our study was to assess the knowledge, attitudes and practices of HCW in the management of PUD at the Paul VI and the Bogodogo District Hospitals in Ouagadougou (Burkina Faso).

SUBJECTS AND METHOD

1. Study Design

It was a cross-sectional descriptive study with a prospective data collection that took place from December 15, 2015 to January 25, 2016. The study was implemented at the Paul VI and the Bogodogo District Hospitals in Ouagadougou (Burkina Faso).

2. Population and Sample

Health care workers (HCWs) were interviewed using a questionnaire. The sample size was 134 HCWs. Only the HCWs working in departments where they are likely to meet PUD cases have been selected. Were included i) general practitioners (GPs), specialized nurses (master level and specialized in a specific field of nursing), professional nurses (license level), certified nurses (end of middle school level), midwives and maieuticians, ii) working in departments likely to visit or hospitalize cases of PUD such as the emergency, paediatrics, ambulatory, maternity and surgery units and iii) consenting to participate in the study.

3. Study Variables

The main variables included socio-demographic characteristics (age, sex, level of education, qualification and experience

(duration) in the profession); the knowledge on PUD (general knowledge, symptoms, physical signs, additional investigation analyses to be ordered, aetiologies, differential diagnoses, treatment, complications and methods of prevention of recurrences); the attitudes of HCW when facing a case of PUD (emergency and non-emergency management attitudes, use of referrals, etc.); the therapeutic practices (diagnosis, treatment and patient follow-up habits).

4. Operational Definition of Variables

Professional experience or duration in the profession has been grouped into three categories including juniors' group (≤ 5 years) mid-career group (between 5 and 10 years) and seniors' group (> 10 years). The knowledge of PUD was categorized in general knowledge and specific knowledge. General knowledge was assessed on the following seven items : i) the definition of PUD (a loss of substance reaching deep into the muscularis) ; ii) the main clinical sign (pain occurring as crisis and influenced by food intakes); iii) the Helicobacter pylori infection as the main aetiology of the disease; iv) the confirmation of the diagnosis by the upper gastrointestinal endoscopy; v) the complications including gastrointestinal bleeding, perforation, stenosis and cancer development; vi) the treatment of the disease with anti-secretories and vii) the combination with antibiotic therapy in case of Helicobacter pylori infection. Any correct answer was scored one point and any incorrect answer was scored zero. The maximum score was therefore seven and the minimum zero. The level of knowledge was considered poor for a score between 0/7 and 1/7, good between 2/7 and 3/7, and excellent when the score ≥4 / 7.

The assessment of specific knowledge was based on the responses to more specific questions such as the symptoms, physical signs, paraclinical examinations, and treatments. Multiple choice questions were used to assess the HCWs' level of knowledge. For these questions, the level of knowledge was considered poor if the respondent found between zero and one correct answer, good between two and three correct answers and excellent for more than three correct answers. Incorrect answers were also proposed as answer options. Checking in the box of a wrong answer will remove one point from the respondent's total points or cancel one correct answer.

5. Study Instruments

An anonymous structured questionnaire was used as a data collection tool. The questionnaire was administered during a face to face meeting with the investigator. When at the first meeting the HCW was not ready or available to answer the questions, another appointment was taken.

6. Data Analysis

A univariate and a bivariate analysis were run. Proportions were used for categorical variables and means for quantitative ones. The chi-square test of independence was used for the statistical analysis to identify association between categorical variables. When the conditions to apply this test were not all met, Yates continuity correction was used. The significance level was set at $p < 0.05$ or if the continuity correction of Yates $\geq C\alpha$ (quantile of order α) for the corresponding degree of freedom. Our data were analysed by Sphinx 5.0.1.8 software. The graphics were produced with Excel 2000 software.

7. Research Ethics

This study was implemented in the context of a medical doctorate thesis. The data collecting forms were anonymised. The study obtained the required authorizations from the hospital management teams. The participants were required to sign an

informed consent form before the inclusion.

<div style="text-align:center">**RESULTS**</div>

1. Sample Characteristics

A total of 139 HCW were contacted; 134 answered the questions, meaning a response rate of 96.4% including 64 and 70 participants from Paul VI and Bogodogo district hospitals, respectively.

Sociodemographic Characteristics

The mean age was 33.6 (± 5.84) years with extremes of 23 and 57 years (Table 1). The females represented 61.9%. According to the qualification, GPs were 23 (17.2%) and nurses 111 (82.2%) participants. Professional nurses represented 45 (33.6%) participants. Four (3%) participants were specialised nurses. Among the participants 53.7% had a university level of education and the junior health professionals represented 50% of the participants.

Table 1. Socio-demographic characteristics.

Variables	Frequency	%	Variables	Frequency	%
Age (years)			**Qualification**		
<25	4	3.00	Medical doctor	23	17.20
25 - 30	29	21.60	Professional nurse	45	33.60
30 - 35	44	32.80	Certified nurse	32	23.90
35 - 40	39	29.10	Midwife / maieutician	29	21.60
40 - 45	12	9.00	Certified midwife	4	3
≥45	6	4.50	Specialised nurse	1	0.70
Sex			**Professional experience (years)**		
Female	83	61.90	0-5	67	50
Education level			5-10	40	29.90
Secondary school	62	46.30	>10	27	20.20
University	72	53.70			

2. Univariate Analysis
Knowledge of PUD

PUD was most often defined as an erosion of the gastric or duodenal wall by 43.3% of HCW (Table 2). The epigastric pain occurring as a burning or a cramp was the most frequent known symptom (95.5% of the participants) while the upper gastro-intestinal endoscopy was the most cited exploration (92.5% of the participants). The stool culture and the serology investigating Helicobacter pylori infection were mentioned in 16.8 and 14.5 % of cases respectively. The infection with Helicobacter pylori was the main cited aetiology of PUD in 53% of cases. The Zollinger -Ellison syndrom was mainly not known (1% of cases).

The amoxicillin (40.2%), metronidazole (36.2%) and clarithromycin (16.3%) were the most known antibiotics and omeprazole, the antisecretory most cited (36.4%). The phloroglucinol (57.6% of participants) and aluminium hydroxide (71.8% of cases) were the antispasmodic and gastric dressing the most mentioned while acetaminophen was the most frequent analgesic (59.4% of cases). The acetylsalicylic acid was also mentioned as an analgesic drug (4.7%).

Table 2. General knowledge of PUD

Knowledge assessed	N	%	Knowledge assessed	N	%
Definition			Stool exam	29	21.60
Erosion of the stomach or duodenal wall	58	43.30	Serological examination	25	18.60
Loss of substance from the stomach or duodenal wall including the muscularis	56	41.80	Do not know	15	11.20
Loss of substance limited to the mucous membrane	10	7.50	Polymerase Chain Reaction	9	6.70
Do not know	10	7.50	Test the urease	4	3.00
Symptoms			**Hygieno-dietetic measures**		
Burning or cramping epigastric pain	128	95.50	Alcohol avoidance	120	89.50
Pain relieved by food or anti-acid medicines intake	96	71.60	Stop taking NSAIDs	111	82.80
Periodic pain punctuated by food intake	62	46.30	Tobacco avoidance	85	63.40
Hematemesis	49	36.60	Fixed eating hours	43	32.10
Melena	37	27.60	Abundant drink	28	20.90
May be asymptomatic	19	14.20	Sports activity	16	11.90
Diffuse abdominal pain	18	13.40	Avoidance of acidic foods	1	0.70
Post-prandial vomiting	18	13.40	**Antibiotics**		
Right or left chest pain	12	8.90	Amoxicillin	111	82.80
Physical signs			Metronidazol	100	74.60
Pain in the epigastric hollow	123	91.80	Clarithromicin	45	33.60
A normal physical examination	66	49.20	Ceftriaxone	9	6.70
An epigastric mass	10	7.50	Cotrimoxazol	7	5.20
Additional analyses			Levofloxacin	4	3.00
Upper gastrointestinal endoscopy	124	92.50	**Antisecretory**		
Anatomopathological analysis of the biopsy obtained from endoscopy	58	43.30	Omeprazol	122	91.00
Full Blood Count	44	32.80	Cimetidine	64	47.80
Barium Contrast Radiography	31	23.10	Lanzoprazol	61	45.50
Abdomen film	28	20.90	Pantoprazol	44	32.80
Creatinine	5	3.70	Ranitidine	30	22.40
Transaminases	3	2.30	Famotidine	14	10.40
Other types of analyses	2	1.50	**Antispasmodics**		
Differential diagnosis			Phloroglucinol	72	53.70
Gastritis	108	80.60	Butylscopalamine	29	21.60
Gastric cancer	81	60.40	Hyoscine butylbromide	14	10.40
Peptic esophagitis	61	45.50	Trimebutine	10	7.50
Pain of pancreatic, cardiac, pulmonary or spinal origin	44	32.80	**Gastric dressings**		
Do not know	6	4.50	Aluminum hydroxide	130	97.00
Possible aetiologies			Magnesium hydroxide	26	19.40
Non steroid anti-inflammatory drugs	104	77.60	Aluminum phosphate	25	18.60
Reaction to stress	104	77.60	**Analgesics**		

Continue.

Knowledge assessed	N	%	Knowledge assessed	N	%
Alcohol consumption	92	68.60	Paracetamol	76	56.70
Smoking	55	41.00	Tramadol	25	18.60
Helicobacter pylori infection	26	19.40	Morphines	12	8.90
The Zollinger -Ellison syndrom	22	16.40	Nefopam	9	6.70
Do not know	2	1.50	Acetylsalcilic acid	6	4.50
Spice consumption	1	0.70	**Complications of PUD**		
Knowledge of Helicobacter pylori		0	Ulcerative perforation	120	89.50
Yes	111	82.80	Gastrointestinal bleeding	101	75.40
No	23	17.20	Cancerous transformation	73	54.50
Nature of Helicobacter pylori			Ulcerative stenosis	48	35.80
Bacterium	84	62.70	Do not know	5	3.70
Do not know	17	12.70	**Means for recurrence prevention**		
Virus	6	4.50	Patient counseling and education on the consumption of selected feed	123	91.80
Parasite	2	1.50	Monitoring treatment effectiveness	100	74.60
Yeast/fungus	2	1.50	Avoidance of soft drinks	62	46.30
Diagnosis of Helicobacter pylori			Follow-up biopsy after treatment	31	23.10
Anatomopathological examination of a biopsy specimen	60	44.80	Do not know	7	5.20
Culture	31	23.10			

Factors associated with the HCWs' knowledge of PUD

Knowledge levels were good to excellent for general knowledge, symptoms and treatment of PUD (Table 3). Depending on the agent's qualification, knowledge levels were excellent in all areas for two-thirds to three-quarters of GPs except for knowledge of additional investigating analyses, where only 47.80% had an excellent knowledge.

Depending on the level of education, the level of knowledge was at least good for more than 500% of the agents except for the knowledge of additional investigating analyses where only 45.20% of the agents of secondary school level had a good knowledge. Whatever the professional experience, all HCWs had good to excellent knowledge in all areas.

Table 3. Level of Knowledge

Assessed Knowledge	Level of knowledge			Assessed Knowledge	Level of knowledge		
	Poor (%)	Good (%)	Excellent (%)		Poor (%)	Good (%)	Excellent (%)
General knowledge	1.50	12.70	85.80	**knowledge of investigation analyses per education level**			
Symptoms	15.70	47.80	36.60	Secondary school	54.80	38.70	6.50
Physical signs	61.90	35.80	2.20	University	19.40	59.70	20.80
Investigation analyses	48	67	19	**Treatment knowledge per education level**			
Treatment	1.50	68.70	29.90	Secondary school	1.60	85.50	12.90
General knowledge per qualification				University	1.40	54.20	44.40
General practitioners	0	0	100	**General knowledge per professional experience**			
Nurses	1.80	15.30	82.90	0 to 5 years	1.50	13.40	85.10
Symptoms knowledge per qualification				6 to 10 years	0	15	85
General practitioner	0	21.70	78.30	> 10 years	3.70	7.40	88.90
Nurse	18.90	53.20	27.90	**Knowledge of symptoms per professional experience**			
Knowledge of physical signs per qualification				0 to 5 years	14.90	43.30	41.80
General practitioner	0	30.40	69.60	6 to 10 years	22.50	47.50	30
Nurse	2.70	68.50	28.80	> 10 years	7.40	59.30	33.30
Knowledge of investigation analyses per qualification				**Knowledge of physical signs per professional experience**			
General practitioner	0	52.20	47.80	0 to 5 years	3	55.20	41.80
Nurse	43.20	49.60	7.20	6 to 10 years	2.50	77.50	20
Treatment knowledge per qualification				> 10 years	0	55.50	44.50
General practitioner	0	26.10	73.90	**Knowledge of investigation analyses per professional experience**			

Nursel	1.80	77.50	20.70	0 to 5 years	28.40	49.20	22.40
General knowledge per education level				6 to 10 years	42.50	52.50	5
Secondary school	3.20	16.10	80.70	> 10 years	44.40	48.20	7.4
University	0	9.70	90.30	**Knowledge of treatment per professional experience**			
Symptoms knowledge per education level				0 to 5 years	3	58.20	38.80
Secondary school	21	54.80	24.20	6 to 10 years	0	80	20
University	11.10	41.70	47.20	> 10 years	0	77.80	22.20
Knowledge of physical signs per education level							
Secondary school	3.20	71	25.80				
University	1.40	54.20	44.40				

Attitude and practices of HCWs facing PUD cases

The HCWs' attitudes while facing a PUD consisted in managing the patients in emergency and out of an emergency context in 45.80% and 42.20% of the cases, respectively (Table 4). Other attitudes (1.20%) consisted in prescribing an anti-secretory and a gastric dresser while awaiting the results of the upper digestive endoscopy. The other alternative was to prescribe a PUD treatment and schedule a follow up visit. If the symptoms were still present, the patient was then referred to a hepato-gastroenterologist.

Regarding the practices, 51.50% of the HCWs systematically requested investigation analyses. Among them, 60.40% requested upper digestive endoscopy and 32.80% investigated the H. pylori aetiology (Table IV).

Table 4. Attitudes and practices of HCWs facing PUD cases

Attitude / practice	Frequency	%	Attitude / practice	Frequency	%
Attitudes			**H. pylori diagnosis**		
Emergency care	61	45.50	Pathology analysis of a biopsy specimen	33	24.60
Non-emergency care	56	42.00	Stool culture	14	10.40
Reference	14	10.50	Serology	11	8.20
Other attitudes	2	1.50	**H. pylori infection management**		
Practices while facing a PUD case in emergency			After confirmation	72	53.70
Systematic prescription of investigation analyses			Presumptive treatment	35	26.10
Yes	65	48.50	No treatment	2	1.50
Prescribed analyses			**PUD monitoring practices**		
Upper gastrointestinal endoscopy	61	45.50	**Follow up endoscopy**		
Full Blood Count	16	11.90	Yes	57	42.50
Pathology analysis of a biopsy from endoscopy	14	10.40	**Context of follow-up endoscopy**		
Barium contrasted radiography	4	3	In case of complications	31	23.10
Abdomen film	4	3	In case of gastric ulcer	20	14.90
Transaminases	2	1.50	Always	10	7.50
Systematic investigation for H. pylori			In case of duodenal ulcer	6	4.50
Yes	44	32.80			

Knowledge of PUD

Generally speaking, HCWs did not know the definition of PUD. This could be justified by the fact that most of the participants considered any ulcer syndrome (epigastric pain) as a true ulcer whereas the definition of the ulcer is anatomical. They were familiar with the symptoms of typical ulcer syndrome. However, the non-typical PUD signs as well as the forms immediately revealed by complications were unrecog-

nized. They usually only knew one or two investigation analyses to confirm the diagnosis of suspected case of PUD. In particular, requesting a barium contrast radiography to confirm a PUD diagnosis was unknown to many participants. How to investigate to identify complications from a PUD was not known either. In contrast, an important number of the interviewed HCWs were aware of the differential diagnoses of PUD.

An important proportion of the HCWs cited wrong aetiologies or did not know the main cause of peptic ulcers at all. Misconceptions such as the occurrence of spice or alcohol-induced PUD were mentioned; the same is true regarding the responsibility of the stress as a risk factor for PUD which was not recognized enough. Smoking as an important risk factor in the occurrence of PUD was not well understood. The lack of knowledge of the Zollinger Ellison syndrome could be explained by the rarity of ulcers linked to this syndrome (Cho and Kasi, 2021).

The HCWs knew better the symptomatic treatments than the actual treatment of the disease. Inappropriate molecules to treat PUD pain such as the antispasmodic and pure painkillers were cited by the participants. The surgery and the endoscopic intervention were seldom cited as treatment methods for PUD by 3.8% and 2.8% of the participants, respectively. These methods are implemented by specialised doctors (surgeons or gastro enterologists) while our survey focused on GPs and nurses.

The effective hygienic and dietetic measures such as NSAIDs and tobacco avoidance were not well known. Besides, erroneous measures such as the practice of sport have been recommended. Likewise in the treatment, efficacious antibiotic molecules like amoxicillin, metronidazole,

clarithromycin and levofloxacin were mentioned as well as non-efficacious ones (Cotrimoxazole, ceftriaxone) even though by a small proportion of the participants. In general, the most cited antisecretory drugs were proton pump inhibitors (PPIs). The superior efficacy of this class compared to H2 blockers as well as the availability of generic forms at low cost would explain the better knowledge of PPIs. In the PPIs drug class, the omeprazole was better known. Marie et al. (2007) also found that omeprazole was the most known PPI in France (71% of the HCW). This molecule is widely available, at a more affordable cost compared to other PPIs. Some serious mistakes have been noted in the knowledge of PUD treatment. In particular, up to 4.7% or the participants cited the acetylsalicylic acid molecule as a painkiller to treat PUD pain.

Generally speaking, the level of knowledge of the PUD was ranked from good to excellent. However, the frequent prescription of symptomatic instead of specific treatment could be the cause of many complications. The HCW knew the complications as well as the means to prevent relapses.

Attitudes and practices of HCWs facing PUD

The preponderant attitude consisted in managing and providing care in emergency contexts. This attitude is easily justified by the painful feature of an ulcer attack. Regarding the practice, the management of a PUD case was based on a diagnosis hypothesis. Investigation analyses are not systematically requested, probably because of their costs in a low socio-economic context. Unsurprisingly, among the requested investigation analyses, the upper gastrointestinal endoscopy was the most requested. A follow-up endoscopy was also requested by 42.50% of HCWs after the treatment and

often in case of complications. The same economic reasons could explain this practice.

The pathology analysis of an endoscopic biopsy was the preferred method used by 60.90% of the participants, to screen for H. Pylori. The stool analysis was the next preferred screening method. These findings are similar to Croze's (Croze, 2011) in France. Despite this screening effort for H. pylori, the treatment was very often presumptive (66.10% of cases). The low socio-economic status of the patients often influences the HCWs to implement presumptive treatments rather than treatments based on evidence. This situation may also be related to a lack of knowledge from the respondents who would ignore the importance of starting an antibiotic treatment based on a confirmed diagnosis, to avoid the emergence of resistant strains. In general there was no standardized attitude or practice for the management of PUD among the participants. Every participant seemed to have his own treatment protocol to provide care to patients suffering from PUD.

Factors associated with the level of knowledge of the PUD

Overall, practitioners had an excellent knowledge of the PUD treatment for 73.9% of the participants. Croze (2011) found appropriate treatment of PUD by 71% of the GPs. Paradoxically, the qualification of the participants was not significantly associated to the PUD knowledge in our study. However, the education level was significantly related to the general knowledge as well as to the knowledge of the symptoms and the investigation analyses. The association was not significant for the knowledge of the physical signs. The highly educated HCWS had a better knowledge of PUD than the HCW who had a secondary school level of education. It has to be acknowledged that all GPs had a university level of education. Based on their training, they have a better understanding of the diseases than nurses. No significant association was identified between the professional experience and general knowledge, the knowledge of the symptoms, the physical signs or the investigation analyses.

In total 5/139 people did not answer the questionnaire. This non-response rate of 3% is within the acceptable limits within which one can reasonably estimate that there is no risk of selection bias. On the other hand, during the survey, many participants mentioned a lack of time and postponed the time to complete the questionnaire. This floating time could be used by participants to refresh their memory on the PUD. However, considering the responses and gaps in some aspects of the knowledge, we concluded that the collected data were reliable meaning that the results could be considered as valid.

Overall, less than half of the interviewed HCW could accurately give the definition of a PUD. The symptoms of the disease were rather well known at the contrary of the examination signs. The main requested investigation to confirm a PUD diagnosis (the upper digestive tract endoscopy) was also well known. However, the recognition of the role of H pylori as well as smoking was not satisfactory with respect to their importance in the treatment and the prevention. There is a need to continuously update the knowledge and competence of HCWs on all topics of interest and specifically on PUD.

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CONFLICT OF INTEREST

There are no conflicts of interest

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