Quality Improvement of Data Collection and Utilization of Health Information from Dhulikhel Hospital Outreach Centers

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Background

Dhulikhel Hospital is a community hospital in Nepal that serves 1.9 million people across 6 districts. An outreach program was established in 2015 to provide health services and education to 16 underserved rural villages and communities, with no standardized way to collect patient health history and track interventions performed by the healthcare team.

Nearly 80% of people living in the rural areas of Nepal do not have access to a public hospital or provider within 30 minutes of their home,[4] and the most common causes of death and disability are related to nutrition, infection, and sanitation. In Nepalese children aged 6-10 years, mean height-for-age relative to WHO reference was 3rd-5th percentile for males and females.[7] Between 1990-2010, diarrheal diseases and lower respiratory infections were the leading causes of healthy life years lost in Nepal.[11] Less than 30% of the population has access to adequate sanitation and safe drinking water.[2] Given the relationship between poor sanitation, undernutrition, and infection risk, the ability to quantify these issues in the rural regions served by the hospital allows appropriate allocation of resources and can inform health policy.

The objective of the project was to create a questionnaire and to have collected health status data in 10% of the target sites by August 2019.

Methods

We conducted a retrospective review of 3084 patients aged 6-16 years who had presented to the Dhulikhel Hospital Pediatric Department between January and June 2018. The data available to our team included patient age, gender, and reason for visit or diagnosis. The diagnoses of these patients are characterized in Table 1. Age distribution is presented in Table 2.

Table 1: Distribution of patient demographics by system-based complaint

System-Based Complaint	Total Amount, n (%)	Females Affected, n (%)	Males Affected, n (%)
Cardiologic	25	12 (0.9%)	13 (0.7%)
Dermatologic	91	43 (3.3%)	48 (2.7%)
Developmental	13	6 (0.5%)	7 (0.4%)
Endocrinologic	12	7 (0.5%)	5 (0.3%)
Ear, Nose, Throat	299	119 (9.1%)	180 (10.1%)
Gastrointestinal	795	332 (25.5%)	463 (26.0%)
Genitourinary	227	108 (8.3%)	119 (6.7%)
Hematologic	10	5 (0.4%)	5 (0.2%)
Hepatologic	41	12 (0.9%)	29 (1.6%)
Infectious	136	54 (1.4%)	82 (4.6%)
Musculoskeletal	48	19 (1.5%)	29 (1.6%)
Neurologic	127	74 (5.6%)	53 (3.0%)
Ophthalmologic	22	12 (0.9%)	10 (0.6%)
Psychiatric	22	13 (1.0%)	9 (0.5%)
Pulmonary	881	346 (26.5%)	535 (30.1%)
Well Child Check	334	141 (10.8%)	193 (10.8%)
Total	**3084**	**1304 (42%)**	**1780 (58%)**

Table 2: Distribution of patients by age

Age	Patients, n (%)
6	475 (15.4%)
7	349 (11.3%)
8	303 (9.8%)
9	306 (9.9%)
10	368 (11.9%)
11	240 (7.8%)
12	185 (6.0%)
13	195 (6.3%)
14	240 (7.8%)
15	271 (8.8%)
16	153 (5.0%)
Total	**3084**

The following diagnosis were included under each body system:
Cardiologic: Rheumatoid or congenital heart disease, palpitations, hypotension; **Dermatologic**: cellulitis, abscess, folliculitis, rash, urticaria; **Development**: Delay, intellectual disability; **Endocrine**: diabetes mellitus, hypo- or hyperthyroidism; **Eyes, Nose, Throat**: ear wax obstruction, otitis, laryngitis, pharyngitis, tonsillitis, dental caries, parotitis; **Gastrointestinal**: dyspepsia/gastritis, gastroenteritis, appendicitis, constipation, diarrhea, dysentery, giardia, intestinal parasites, hernia, pyloric stenosis, underweight/malnutrition; **Genitourinary**: urinary tract infection, ureterolithiasis, genital infections, glomerulonephritis, ovarian cyst; **Heme**: anemia, leukemia, immune thrombocytopenia, reactive lymphadenitis; **Hepatologic**: acute hepatitis; **Infectious disease**: measles, unclassified fever, scabies, tinea; **Musculoskeletal**: trauma/injury, laceration, scoliosis, muscle pain, rheumatoid arthritis, costochondritis; **Neurologic**: seizure, epilepsy, cerebral palsy, intracranial hemorrhage, migraine, headache; **Ophthalmologic**: conjunctivitis; **Psychiatric**: anxiety, depression, behavioral problems, post-traumatic disorder; **Pulmonary**: pneumonia, upper and lower respiratory tract infection, coryza, common cold, croup, tuberculosis, asthma, bronchiolitis; **Well child check:** immunization, check-up.

The PubMed database was reviewed in June 2018 to identify studies that surveyed pediatric illnesses in the rural regions of Nepal. Search terms included, but was not limited to: “pediatric, disease, rural, Terai AND Nepal.” Studies published before 2000 were excluded. The search produced 19 results, of which six were referenced in our project and used to formulate the health status questionnaire. Most common concerns reported in the published data included water, sanitation, hygiene, and nutrition.[7,14] Pediatricians in the outpatient clinic were interviewed to provide their perspective on what should be included on a health status questionnaire.

Results

Screening Questionnaire

Past Medical History

Prenatal and Birth History:
1. Where were you born? (circle one)
   a. Home / Hospital
2. Were there birth complications or hospitalizations?
   a. Yes
      i. Explain:_____
   b. No
3. How were you fed?
   a. Breast / Bottle

Developmental History:
1. Does the child struggle with learning?
   a. Yes / No
2. Does the child have difficulty focusing in school?
   a. Yes / No
3. Does the child struggle with social interaction?
   a. Yes / No
4. Does the child have hearing difficulties?
   a. Yes / No
5. Do you have concerns with this child’s speech?
   a. Yes / No

Prior Illnesses and Injuries:
1. Have you ever been hospitalized?
   a. Yes / No
      If yes, explain _____
2. Have you ever had surgery?
   a. Yes / No
      If yes, explain _____
3. Have you ever been in a car accident?
   a. Yes / No
      If yes, explain _____
4. Do you have allergies?
   a. Yes / No
      If yes, explain _____
5. Are you currently on any medications?
   a. Yes / No
      If yes, explain _____
6. Have you taken any De-Worming (Anti-Worm, Anti-Helminth) medication in the last 12 months?
   a. Yes / No / Unsure
      If yes, explain _____
7. Have you been diagnosed with any of the following? Circle all that apply.

Head & Neck	Dental caries Otitis externa Otitis media Tonsillitis pharyngitis	Gastrointestinal	Diarrhea due to: Enteric fever Amoebic dysentery Helminth infection Gastrointestinal reflux disease Constipation Gallstones Appendicitis
Pulmonary	Asthma Pneumonia Tuberculosis Influenza Bronchitis Croup	Genitourinary	Urinary tract infection Stones in kidney or ureter Genital infections
Hematology	Malaria Anemia	Dermatology	cellulitis Impetigo Scabies Hand, Foot and Mouth Disease

Social History

1. In what district do you live?
2. What type of housing do you have?
3. Who lives in your home?
4. Mother’s occupation ____
5. Father’s occupation ____
6. Exposures:
   a. Smoke
   b. Livestock
7. Do you use alcohol?
   a. Yes / No
      If yes, how often? Daily/ 3-5 times a week / once per week / once per month
8. Do you use tobacco?
   a. Yes / No
      If yes, how much per day? 1-5 sticks / 6-10 sticks / 11-20 sticks / more than 20 sticks
9. Do you use cannabis (marijuana, hash, weed)?
   a. Yes / No
      If yes, how often? Once a month / once a week/ once a day / more than 2 times a day
10. Have you ever tried any other drugs besides cannabis (Opium, heroin, cocaine, pills, etc.)?
    a. Yes / No
       If yes, please list _____

FAMILY HISTORY

Check all that apply:

	Diabetes	High blood pressure	Heart disease	COPD
Mother				
Maternal grandmother				
Maternal grandfather				
Father				
Paternal grandmother				
Paternal grandfather				
Brothers				
Sisters				

NUTRITION

Check meals you eat at home or at school:

	Home	School
Breakfast		
Morning snack		
Lunch		
Afternoon snack		
Dinner		
Evening snack		

Do you eat vegetables? Yes No

From where do you get vegetables? _____

How many servings per day? (Select One Option)
None
1-2 serving/day
3-5
5+ servings/day

Do you eat fruits? Yes No

From where do you get fruits? _____

How many servings per day? (Select One Option)
None
1-2 serving/day
3-5 servings/day
5+ servings/day

How many servings of carbohydrates do you have per day such as Rice, Pasta, Bread, or Potatoes? (Select One Option)
None
1-2 serving/day
3-5 servings/day
5-7 servings/day
7+ servings/day

How many servings of dairy do you have per day? (Select One Option)
None
1-2 serving/day
3-5 servings/day
5+ servings/day

How many servings of protein do you have per day such as eggs, chicken, buffalo or fish? (Select one option)
None
1-2 serving/day
3-5 servings/day
5+ servings/day

Are you vegetarian or vegan? (Select one option)
Vegetarian
Vegan
Neither

WATER, SANITATION, HYGIENE

How much water do you drink per day? (Select One Option)
< 500 mL
500 mL
500 – 1000 mL
1000 – 1500 mL
+1500 mL

What kind of water do you have at home?
Well water
Tap water
Pond water
Natural stream

How often do you bathe?
Less than once per week
Once per week
Multiple times per week
Every Day

How often do you brush your teeth?
Less than once per week
Once per week
Multiple times per week
Every Day

Do you use toothpaste?
Yes
No

Do you wash your hands with soap before eating?
Yes
No
Sometimes

FEMALES ONLY

Have you started your period? YES NO

Do you have access to pads/sanitary napkins? YES NO

Are you absent from school during your period? YES NO

REVIEW OF SYSTEMS/HEALTH STATUS ASSESSMENT

General/Vitals	Height _____ Weight _____ Mid-arm circumference_____ Temp _____ RR _____ HR _____ BP _____ General assessment: (alert, lethargic, depressed, other)
HEENT	Ears • Aches • Decreased hearing • Ringing Eyes • Itching • Burning • Blurry vision • Flashing lights Nose • stuffiness • nosebleeds • discharge Throat • pain or difficulty swallowing • sore throat
Respiratory	• cough o dry/wet o sputum/blood production • shortness of breath • wheezing/crackles • snoring or mouth breathing • difficulty breathing
Cardiovascular	• chest pain • palpitations • swelling in legs
GI	• hepatomegaly • splenomegaly • diarrhea o blood o mucus o pus • constipation • nausea • vomiting • abdominal pain • abdominal distension
GU	• burning with urination • pain with urination • frequency • urgency • blood in urine • cloudy urine • increased or decreased urine output
MSK	• muscle pain
	• joint pain • joint swelling
Neurologic	• Headache • numbness • tingling • weakness • seizures
Endocrine	• Change in appetite • thirst • sweating
Skin	• itchiness • dryness • redness • rashes • nail changes • hair changes

Discussion

Conclusion

The questionnaire was intended to aid in the screening of common pediatric illnesses likely to be found in rural regions of Nepal, and collect data on the baseline health of the 6-16 year-old population. Given the paucity of health status data for this group, the accumulation of hundreds of these questionnaires can serve as an expanding source of data specific to the target regions.

From Table 1, the most commonly diagnosed illnesses were within the gastrointestinal and pulmonary systems. Identifying this in patients served at the Dhulikhel Hospital allows one to extrapolate that it is also true to the districts served by the outreach centers.

Along with improving preparation of the providers, information from the questionnaire can advise resource allocation. The ability to collect data that shows inadequate sanitation, nutrition, or high prevalence of infectious disease in regions served by the outreach centers can support changes in public health policy and monitor health trends over time.

This questionnaire has potential to be a comprehensive and useful tool to satisfy the rural clinician around Dhulikhel and the many rural regions of Nepal. It will be translated to Nepali and Hindi languages to account for the majority of patients served at the outreach centers. Future plans include receiving and incorporating feedback from the Dhulikhel Hospital Public Health Department and the Pediatric Department.

Limitations

Data provided by the outpatient pediatric department is only representative of patients who had the means to travel to the hospital. While the questionnaire was developed to be as comprehensive as possible, it likely does not capture some conditions suffered more often by those served by the outreach programs.

Issues that may hinder usefulness of the questionnaire include patient inability to remember or understand prior diagnoses due to loss of prior medical records and lack of medical literacy. The length of the questionnaire may also be extensive and increases the risk of patients declining to respond.

We were not able to achieve our goal of a final draft or collection of information from 10% of the target sites as we are awaiting formal review of the questionnaire from faculty at Dhulikhel Hospital.

Disclosures

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References