approach is multidisciplinary, which includes teamwork and support from various specialties. During almost all phases of treatment, dental services are needed and orthodontists are almost always needed from early treatment until late adult life [19]. Good facial and dental aesthetics may have a beneficial role on behavior and self-esteem. Clinicians are expected to produce evidence of the quality of care they deliver. To this end, it is necessary to use standardized, valid, and reliable psychological as well as clinical measures to evaluate outcomes [20-22].

The research in this area is somewhat conflicting and suffers various lacunae for methodological reasons. These include inconsistency in psychometric scales and constructs used, the lack of validity and reliability in many of the measures, small sample sizes, and no subcategorization of anomalies among other methodological errors [23]. Investigators have highlighted the need to move towards a 'social science model' from a 'medical model' [24-27].

This study was undertaken to assess the impact of psychological adjustment due to altered facial and dental appearance in patients with craniofacial anomalies utilizing the Derriford Appearance Scale [28] and Psychological Impact of Dental Aesthetic Questionnaire (PIDAQ) [20] which are specially designed for evaluating the psychological adjustment in people with visible differences in appearance. There are few such studies utilizing the Derriford Appearance Scale [29] and no study studying the psychological impact of facial and dental aesthetics together.

There is a strong *prima facie* case for comparing rural and urban populations with regard to appearance satisfaction in Nepal. There are known differences in healthcare access, service utilization, and geographic distribution of providers and services in healthcare in Nepal, with rural communities typically experiencing greater difficulties than urban comparators [30]. Given the potential for increased social isolation on one hand, but possibility of reduced prevalence of contemporary appearance pressures in more isolated communities on the other, and the likely relation between this and appearance expectations and outcomes, we included an exploratory investigation of rural versus urban populations within this study.

The objectives of this study were therefore:

1. To assess the psychological impact of facial and dental appearance in patients with craniofacial anomalies in comparison to a general population sample.
2. To explore the relationship between urban and rural residence in relation to psychosocial impact of facial and dental anomalies.

The following hypotheses were put forward:

- H1 - There is a psychosocial impact of facial and dental appearance on patients with craniofacial anomalies.
- H2 - There is a difference in psychosocial impact of facial and dental appearance of rural and urban patients.

Methods

This study was conducted in two steps. The first step included translation and validation of the instruments - PIDAQ and DAS59 in the target population. This part is described in detail as published data elsewhere [31,32]. The second step included assessment of patients with craniofacial anomalies reporting for orthodontic treatment using these validated instruments.

The study was conducted in the Department of Orthodontics, BP Koirala Institute of Health Sciences, Dharan, Nepal, from 1 February 2011 to 30 October 2012. Ethical clearance was obtained from Institutional Ethical Committee, B.P. Koirala Institute of Health Sciences, Dharan, Nepal, reference no. Acd/216/068/069, and principles from the Declaration of Helsinki were followed. The study population consisted of adult patients with congenital craniofacial anomalies visiting the Department of Orthodontics during the above said period. The study also included similar patients who were referred/or reported to the orthodontic OPD during 2005 to 2010 and did not undergo orthodontic treatment and patients from the waiting list for whom treatment had not started. The inclusion criteria were adult patients with congenital craniofacial anomalies aged 18 to 30 years. Patients with acquired or traumatic facial disfigurement and history of orthodontic treatment, people who did not have the capacity to offer informed consent, and people who could not read the test booklet unaided were excluded.

Table 1 Classification of patients who participated in the study according to the diagnosis of craniofacial anomalies

Serial number	Craniofacial anomalies	Number (102)
1.	Isolated cleft lip/palate	45
2.	Isolated craniosynostosis	22
3.	Hemifacial microsomia	10
4.	Ectodermal dysplasia	4
5.	Cleidocranial dysplasia	3
6.	Treacher Collins syndrome	6
7.	Pierre Robin syndrome	4
8.	Crouzon's syndrome	4
9.	Apert's syndrome	4